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Dusky Eagle Owl
Merlin

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Birds of the south-western Deccan Plateau region of Maharashtra, India, with special reference to the Great Indian Bustard *Ardeotis nigriceps*

Sujit S. Narwade & Asad R. Rahmani

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Abstract

In the Great Indian Bustard Sanctuary, Solapur, Maharashtra, and its surrounding Deccan Plateau landscape, we documented the status of 282 species of birds (254 by us, and 27 through an eBird checklist review); including fourteen Threatened, with special emphasis on the Great Indian Bustard *Ardeotis nigriceps*, and eight Near-Threatened categories of the IUCN Red List of Threatened Species (IUCN 2020). The status of eight grassland obligatory species of Least Concern (IUCN 2020), such as larks (Alaudidae), Indian Courser *Cursorius coromandelicus*, and Chestnut-bellied Sandgrouse *Pterocles exustus* are also discussed. Seasonal variation in bird richness at various habitats, encounter rate per hour for each species, and flock size of selected species have been provided. To understand deeper aspects about encounter rate and flock size in lark species, data were pulled out separately from the transect data. A one square kilometer patch of grassland was selected at Nannaj-Mardi (adjacent to the Great Indian Bustard Sanctuary) for a breeding survey of larks. Out of 254 bird species documented, 143 were residents, 22 locally migratory, 84 long distance migrants, four resident-local migratory, and one resident-migratory. A note on roosting sites of 23 species of birds on trees, as well as six ground roosting species is given separately. Locations of existing, and upcoming, industrial developments have been overlaid on Great Indian Bustard distribution location data as well as on 14 selected grasslands of more than 300 ha each, to understand the threats to the birds and the habitat.

Introduction

Pioneering studies documented the avifauna of this region in the nineteenth century (e.g., Sykes 1832; Jerdon 1839; Burgess 1854, 1855; and Fairbank 1876). Davidson & Wenden (1878) listed 361 species during an expedition to Pune, Satara, Sangli, Ahmednagar, and Solapur districts—areas we cover in our study. Butler (1881) listed 452 species during his intensive survey in the Ahmednagar, Pune, Solapur, and part of Satara districts (his 'Deccan and South Mahratta Country').

Nearly half a century later Ali & Whistler (1934) conducted ornithological surveys in erstwhile Hyderabad State, up to the Marathwada region of present-day Maharashtra, including parts of Osmanabad District. Mahabal's (1989) bird list from Solapur District came five decades subsequently, detailing bird sightings in the administrative units called Taluka in the local language. While studying Great Indian Bustards, Rahmani (1989) listed 115 species from Nannaj and surrounds, Solapur District. Bharucha & Gogte (1990) studied the avian profile of a human-modified aquatic ecosystem in the backwaters of the Ujani Dam, and recorded the colonial nesting of water birds. Prasad (2004) compiled an annotated checklist of 532 bird species found in western Maharashtra, which included the present study area. More recent works from our study area include that of Narwade & Fartade (2010) who addressed threats to the ground nesting birds around Osmanabad, and of Hippargi *et al.* (2012) who restricted themselves to a one square kilometre patch of unprotected grassland on the south of Solapur city.

The decrease in the population of large ground birds, such as the Critically Endangered (hereinafter, CR) Great Indian Bustard *Ardeotis nigriceps*, and the Endangered (hereinafter, EN) Lesser Florican *Sypheotides indicus*, due to habitat degradation and hunting was noted at the turn of the twentieth century (Rahmani 2002).

Most of the earlier studies comprised rapid expeditions in the Deccan Plateau, or focused only on the Great Indian Bustard in a small pocket of the core area of the Nannaj-Mardi Great Indian Bustard Sanctuary, and lacked quantitative data. Due to insufficient data on the status and distribution of birds, and given the rapidity of change in this landscape, it is becoming difficult to implement effective management and conservation initiatives. Our attempt at a more holistic approach tries to fill this gap for the south-western part of the Deccan Plateau region of Maharashtra.

Study area

We covered all representative habitats of the districts of Osmanabad, Solapur, Satara, and Pune (non-hilly parts). An intensive study was conducted in the Great Indian Bustard Sanctuary, Solapur, and its surrounding ~ 50 km radius (Talukas of North Solapur, South Solapur, Mohol, Barshi, and Mangalvedha), while other parts of the districts, with similar representative habitats, were covered opportunistically (17.00°N–19.00°N, 74.00°N–77.00°E; 400–600 m asl). These included areas from the Talukas of Osmanabad, Washi, Lohara, and Tuljapur in Osmanabad District; Baramati, and Indapur in Pune District;

Mahsawad and Man in Satara District; and Ahmedpur in Latur District (Fig. 1). This region is classified under 6B Central Region of Deccan Peninsula by Rodgers & Panwar (1988), and the forest type represents Southern Tropical Thorn Scrub (6A/CI) (Champion & Seth 1968), but includes patches of the tropical dry deciduous forest also.

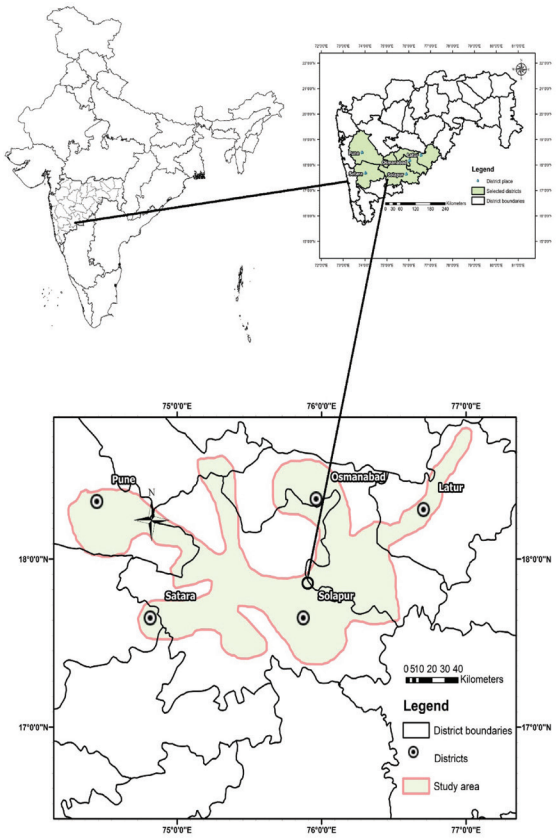

Fig. 1. Study area (intensive study area ~ 50 km radius of Great Indian Bustard Sanctuary, Nannaj, Solapur, and extensive study area as shown above)

1. Climate
2. The climate of the study area is tropical, with hot summers (28–48ºC) and cool winters (13–27ºC), with the average rainfall being 488 mm (450–600 mm) during 1900–2000 (Pathak & Gagrani 2006). During our study, with the exception of 2010 when rainfall was comparatively high (800 mm), the area faced semi-drought conditions in 2012 (400 mm) and 2014 (<400 mm). Scarcity of fodder, during drought years, forced farmers to hold their cattle in government-run stalls and feeding sites called '*chara chavnis*' in Marathi. Out of 11 Talukas of Solapur District hereinafter, Mangalvedha and Sangola, in the western region, are particularly more drought prone, and received very low rainfall (~ 400 mm).

Methods

Our study was conducted from January 2010 to December 2018, with an initial phase of area exploration during 2010–2012, intensive field surveys during 2013–2015, and follow up studies during 2016–2018. The study sites were fixed based on literature review, feedback received from local birdwatchers, and fine-tuned after initial field visits. We customized surveys (Table 1) for (a) common and widely distributed birds in open areas, (b) wetland birds, (c) Great Indian Bustard, (d) other globally threatened species, (e) breeding bird surveys (of Least Concern) grassland obligatory species, and (f) roost site counts of flocking species. For studies of crepuscular, nocturnal, and highly localized species as well as those most detectable in the non-breeding season, we visited the area outside transect duration. We divided the year into three seasons—monsoon (June–September), winter (October–February), and summer (March–May)—to record seasonal variation in the population of birds.

A. **Open area species:** Based on our knowledge of the area, and Google Earth map images, we laid ten transects each, in grassland, agricultural areas, and patches of dry deciduous forests within a 15 km radius of Nannaj-Mardi (17.79ºN, 75.87ºE). Transects (1,000 m x 50 m) were positioned randomly, and visited at least once each season (Bibby *et al.* 2000; Strindberg & Buckland 2004), amounting to an effort of 90 h (Table 1). An observer and a field assistant conducted the surveys in transects spread across the landscape (see Fig. 5) at fixed times of the day: 0600–1000 h and 1600–1830 h during 2013–2015. The average time they took per transect was 20 min. Their counts have been used to analyse the species encounter rate per hour (Appendix 1), as well as box plot for understanding the flock size (Figs. 2, 3). For every transect walked, we counted the number of individuals of all species, and calculated the mean encounter rate in terms of the number of individuals per transect of observation, in each season, and not all

Table 1. Details of the customised field surveys

Sr. No.	Type of survey	Number of sites	Season/months/year	Habitat types covered	Total field hours
A	Open area (transects)	10	3 seasons in 3 years (2013–2015)	3 (Grassland, agriculture, plantations)	90
B	Wetland birds	3	12 monthly surveys	Wetland	18
C	Great Indian Bustard survey	Landscape	3 seasons per year during 2010–2017	Grassland and croplands	1,152 (multiple observers)
D	Globally threatened species	Landscape	Entire study period	Grassland, agriculture, plantations, wetlands	Data extracted from all types of surveys done
E	Breeding bird survey of Least Concern grassland obligatory species	Fortnightly (12 in six months)	February to September 2015	1 sq km area of Nannaj-Mardi	12
F	Roosting sites	37 (23 tree roosts and 14 ground roosts)	2 visits (September 2014–October 2015)	Roosting sites	74

seasons pooled together (*see* Shahabuddin et al. 2017). We did not calculate the encounter rate for nocturnal species and opportunistic sighting records, which were noted while travelling from one place to another and not included in the systematic surveys as provided in table number 1. We used 'Biodiversity-Pro' software (McAleece et al. 1997) to plot a rarefaction curve showing spatial and seasonal variation in species richness of birds in the study area. We created the rarefaction curve by randomly re-sampling the pool of N samples, multiple times, and then plotting the average number of species found in each habitat sample for a season. Box plots were prepared for comparing the flock sizes among a group/cluster of birds. The number of birds detected in various group sizes are arranged in separate columns and considered as a flock/cluster/group.

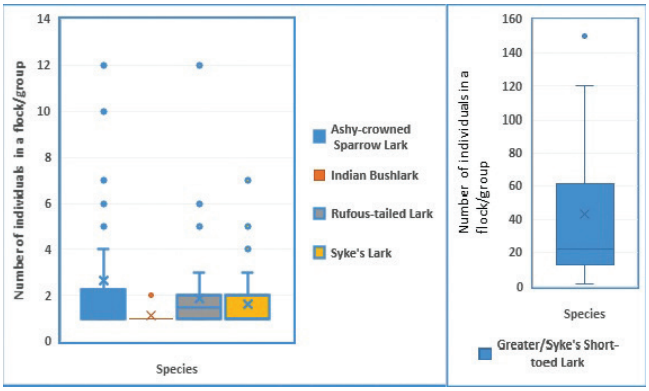

Fig. 2. Box plots showing flock size of the lark species found in study area. Graph for Greater/ Sykes's Short-toed Lark (n=19) given separately as large flock size influnces the visual interpretation of other species.

Note - Box plot splits data into quartiles: the body of boxplot consists of first (Q1) and third (Q3) quartiles, vertical line within the box is median indicates usual flock size of the species and outliers are the occasional congregations seen. Two horizontal lines are called whiskers, one goes from Q1 to smallest non-outlier in data set and other goes from Q3 to largest outlier. Open circles are outliers.

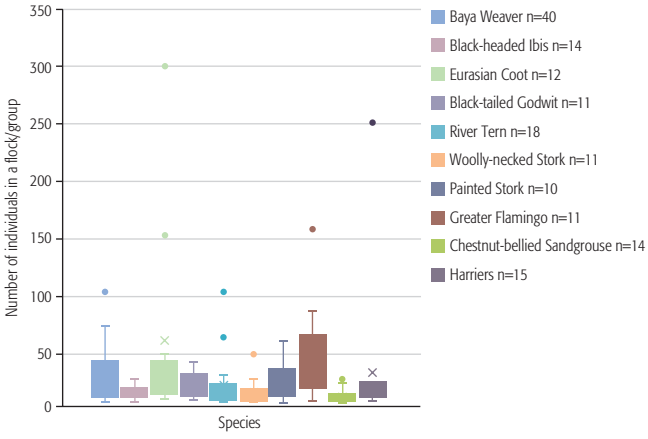

Fig. 3. Box plots showing flock size of the bird species

B. Wetland birds: Counts were carried out at three wetlands: a small wetland of about 150 ha in Masla, Tuljapur Taluka, Osmanabad District; Hotgi, a medium-sized wetland (*c.*300 ha, South Solapur Taluka, Solapur District; and a large-sized wetland (*c.*500 ha) in Hipparga, North Solapur Taluka, Solapur District (Fig. 2). These three wetlands were visited monthly between September 2013 and October 2014, and all the birds exclusively observed on water reservoirs were counted and, hence, the encounter rate for them is calculated using point count hours (Bayani & Dandekar 2017). Visits to the wetlands were made between 1600 h and 1630 h each time to keep uniformity in data collection, amounting to 18 h of effort (Table 1). When the small and medium wetlands were dry in summer, we also visited other adjoining wetlands to check the presence of birds in the study area (data not included here). Monthly variation in bird count at different size of wetlands plotted using bar graphs (Fig. 4).

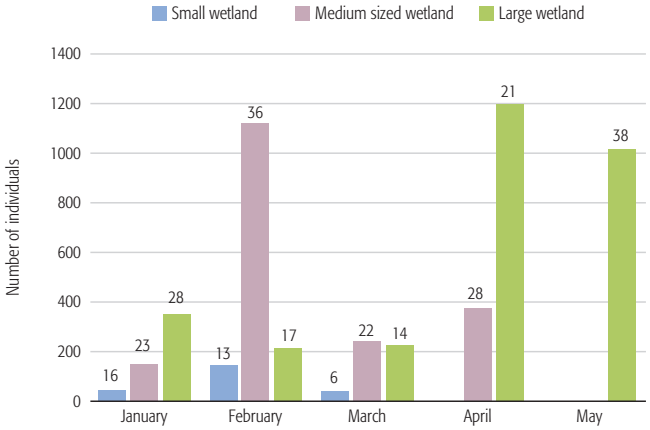

Fig. 4. Monthly variation in bird count at different size of wetlands in study area in 2013 (On top of column, number of species has been mentioned)

C. Great Indian Bustard: Specific survey areas were identified, using historical sighting data (Rahmani et al. 2014). Great Indian Bustard is known to move a lot and can be seen up to 50–100 km from its breeding site. Therefore, to avoid duplicate counts, the maximum number of birds counted in a single day was considered as the estimated population count of the study area (Fig. 1), following the method used by Rahmani (1989). With the help of local NGOs and six volunteers, we conducted three seasonal surveys annually, at landscape level, to understand the seasonal variation in the Great Indian Bustard count in our study area (Fig. 7).

D. Other Threatened and Near Threatened birds: Data has been pooled from transects and point counts for flock/ group size analysis.

E. Other grassland obligatory species: To understand more details of the encounter rate and flock size in lark species, the data were pulled out separately from the transect data (Buckland et al. 2008), and has been plotted by line graph (Fig. 2). One square kilometer of grassland was selected at Nannaj-Mardi (adjacent to Great Indian Bustard Sanctuary) for researching upon breeding birds. Numbers of nests of particular species were counted during March to October 2013 to know fluctuation in the number of nests. We visited the above-mentioned site fortnightly.

F. Roosting birds: Initially we conducted opportunistic surveys at multiple sites, and identified communal roosts with the help of local volunteers (Table 5). Birds were located by

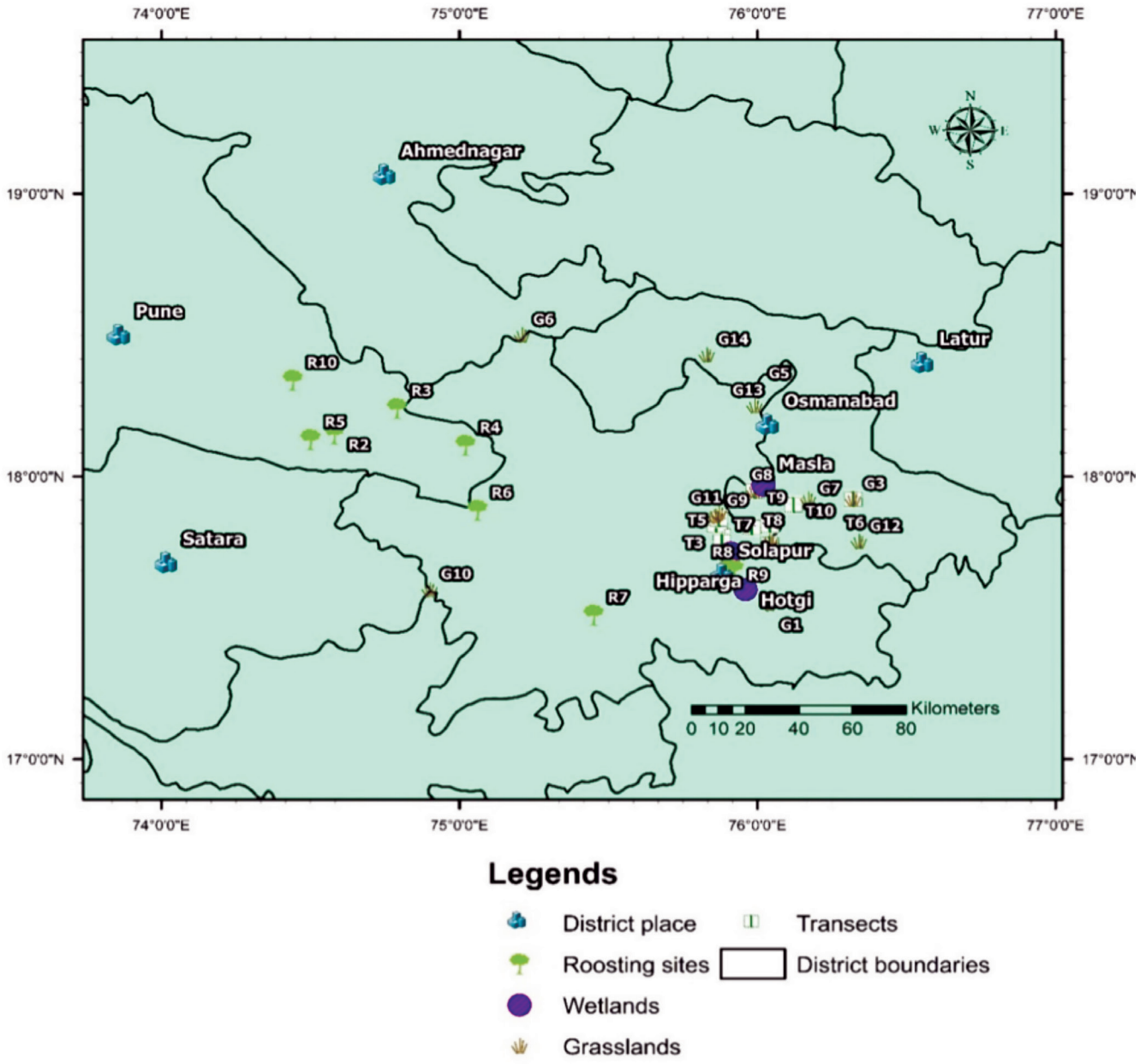

Fig. 5. Map showing study sites such as grasslands, wetlands, tarnsects laid, roosting sites covered across the landscape

Wetlands: Hipparga (large), Hotgi (medium) and Masla (small)

Grasslands: Osmanabad District: G3=Dahivadi-Kati, Taluka Tuljapur; G4=Devkuruli-Katgaon, Taluka Tuljapur; G8=Masla-Pangardarwadi grassland, Taluka Tuljapur; G11=Savargao-Kemwadi, Taluka Tuljapur; G12- Vadacha Tanda, Naldurga, Taluka Tuljapur; G13=Yedshi, Taluka Osmanabad; G14=Yermala, Taluka Kalamb. **Satara District:** G7=Karkhel, Taluka Mhaswad; G10=Rajewadi, Taluka Mhaswad. **Solapur District:** G1=Achegaon-Auj, Taluka South Solapur; G2=Boramani-Dhotri, Taluka South Solapur; G5=Jathar Bablyat, Taluka Mangalvedha; G6=Kamone-Khadki, Taluka Karmala; G9=Nannaj-Vadala-Mardi grassland, Taluka North Solapur.

Tree roosting sites: Pune District: R2=Baramati, Taluka Baramati; R3=Bhadalwadi, Taluka Indapur; R4=Indapur town, Taluka Indapur; R5 -Malegaon Budruk, Taluka Baramati. **Solapur District:** R1=Balives area, Solapur District Town; R6=Malinagar; R7=Mangalvedha town, Taluka Mangalvedha; R8=Near Hotel Vikram Palace; R9=Police Headquarter, Solapur city; R10=Rupa Bhavani temple.

Transect locations: Osmanabad District: T6=Dahivadi-Kati, Taluka Tuljapur; T9=Masla-Pangardarwadi grassland, Taluka Tuljapur; T10=Kasai, Taluka Tuljapur. **Solapur District:** T1=Akolekati-Mardi road, Taluka North Solapur; T2=Gangewadi, Taluka South Solapur (boundary place); T3=Plantations, Behind Rest House Nannaj, Taluka North Solapur; T4=Boramani-Dhotri, Taluka South Solapur; T5=Courser hill area, Nannaj, Taluka North Solapur; T7=Karamba, Taluka North Solapur; T8=Kasegao-Gangewadi, Taluka South Solapur;

following flight lines, especially in the evenings, and direct observations while walking along roads, alongside wetlands, in villages, and grassland patches. A Global Positioning System (GPS) device was used to record accurate geographical coordinates of all observations. The numbers of birds arriving at roosts, in the evening, were counted till it became dark. This was done once a month, by one observer, from September 2013 to October 2014. It was difficult to get exact numbers and therefore, estimates have been provided as baseline data for further research.

G. **Data from other sources:** We also referred to the earlier records of the birds reported from intensive study area of Great Indian Bustard Sanctuary, Nannaj, Solapur and 50 km radius. Check lists (Hipparga Lake, Hiraj, and Yamai Lake in Pandharpur Taluka of District Solapur; and Tata Institute of Social Science Tuljapur, Gangewadi, and Katgao lakes of District Osmanabad) uploaded on eBird (www.eBird.org; up to March 2020 in the revised manuscript) were referred to capture the overall bird species diversity in our study area during our study period. This list, along with the cited literature, showed us the species that we did not record during our study and details provided along with the citations (Appendix 2).

Results and discussion

We documented 254 bird species and summarised their status in Table 2 (for more details please see Appendix 1). Twenty-seven species, which were recorded by other observers on eBird, are listed separately.

Seasonal variation in the population of birds in different habitats

The species richness, in grasslands, was highest in the monsoon as compared to the other two seasons (Fig. 6). In the monsoons, the Baya Weaver *Ploceus philippinus*, Indian Courser *Cursorius coromandelicus*, larks (Alaudidae), and francolins (*Francolinus* spp.) were seen frequently as they nested in the study area. The Indian Courser was seen congregating at its breeding grounds in undisturbed grassland, and sometimes up to 70 individuals were seen together. During summer, the overall encounter rate of all birds was low, while species richness in the agriculture areas was high in winters as compared to the other two seasons (Fig. 6). Here we would like to give an example of seasonal variation in the count of the Baya Weaver. The Baya Weaver was encountered in flocks of 40–200 birds during transects, and in the hundreds at roost sites (for example nearly ~ 8,000 birds were seen in a forest patch at Ramling, Osmanabad District). We also noted passage migrants. For example, the Indian Paradise-flycatcher *Terpsiphone paradisi* was recorded in some forested areas mainly during September–October and March–April.

Wetland birds

During summer very few birds were present on small and medium-sized wetlands as compared to the larger waterbodies (Fig. 2). In the monsoons, species such as storks (Ciconiidae), herons (Ardeidae), and egrets were seen spreading throughout

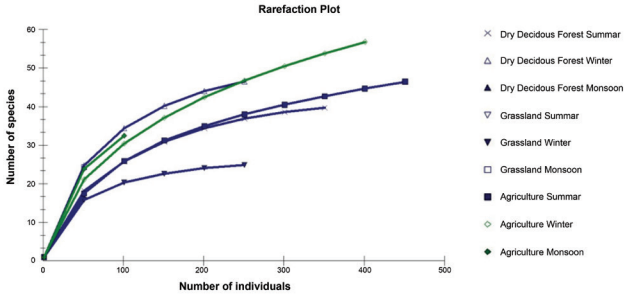

Fig. 6. Rarefraction curve showing spatial and seasonal variation in species richness in study area

the study area. Migratory Black Stork and White Stork were seen occasionally in the study area. Large flocks of passerines, such as larks and weavers, used the edges of these waterbodies in summers. In winter, ducks and geese (Anatidae) were recorded feeding in adjoining croplands in the early mornings and resting during daytime at the waterbodies. We noted a sudden increase in the populations of Eurasian Coot *Fulica atra* and cormorants (*Phalacrocorax* spp.) in the monsoons. Usually 50–100 coots were sighted in the wetlands, but a sighting of more than 1,000 coots in winter (Fig. 4) indicated local movements, although this needs further studies. Ground-nesting colonial water birds such as pratincoles and plovers were seen on the edges of the waterbodies during summer and pre-monsoon seasons. Greater Flamingo *Phoenicopterus roseus* was reported as rare previously in the study area (Deccan Plateau), but flocks of 50–60 birds were commonly seen at almost all major wetlands, with a maximum of over 150 birds during April–May one site (at Hipparga lake) (Fig. 4).

Critically Endangered

Great Indian Bustard One can judge how wide-ranging and abundant the Great Indian Bustard was in the Deccan, in days gone by, from notes in *The Oriental Sports Magazine*, wherein it was mentioned that Robert Mansfield, a British officer, killed 961 bustards in Ahmednagar District during 1809–1829 (Burton 1920). The Great Indian Bustard was recorded from various parts of Maharashtra such as, Nagpur, Vardha, Yawatmal, and Chandrapur districts of the Vidarbha region (Rego 1983; Garde 1993; Pimplapure 2001; Kasambe et al. 2007; Thosar et al. 2007); Vaijapur Taluka of Aurangabad District, Mukhed- and Udgir Talukas of Nanded District, and Parbhani by (Ali & Whistler 1939, 1940; Ahmednagar (Dangre 1966; Kurhade & Jagtap 1998); and Pune (Nalavade 1992). The population of the Great Indian Bustard in the Great Indian Bustard Sanctuary was 50–60

Table 2. Summary of resident and migratory birds in study area

Sr. No.	Migratory/Resident status	Number of species	Criteria
1	Resident (R)	143	Breeds and seen most of the time in study area
2	Locally Migratory (LM)	22	Birds seen in study area most of the time and breeding in neighbouring areas of few km away
3	Long distance migrants (M)	84	Seen only in specific season and not breeding in study area
4	Breeding visitors (BV)	4	Birds breed in study area and not seen regularly during rest of the period
5	Resident-migratory (RM)	1	Part of the bird population breeds in study area while large number of migratory populations seen along with the resident population, in winter

birds in the 1980s (Kulkarni 1981; Rahmani & Manakadan 1990; Kumar et al. 1997), and *c*.30–40 during 2000–2006 (Rahmani & Kalra 2005). This population declined to 13 in 2010, five birds in 2015, and then a single bird was seen in 2016 (Fig. 7) in the Great Indian Bustard Sanctuary, Maharashtra (366.73 sq. km in the districts of Solapur and Ahmednagar). During 1980–1990, after its initial success, bustard conservation failed in many areas because of poor habitat management in protected areas, by the forest department, and the change in land use in non-protected areas (Ali et al. 1984; Rahmani 1989; Rahmani et al. 2014). Extensive infrastructure developments, such as heavy-duty overhead wires, roads, industries, and canals completely changed the habitat on a landscape level (Fig. 8). For example, during our study an adult male Great Indian Bustard collided with a power line in the Nannaj area in September 2015 (Bhagwat Mhaske from Great Indian Bustard Sanctuary, Nannaj, *verbally*, September 2015). A female bustard, with a leg injury (probably due to collision with a power line), was brought to the forest department in February 2012. She was treated and kept in a cage for one-and-a-half months, but died in March 2012 (Source: Pune Wildlife Division).

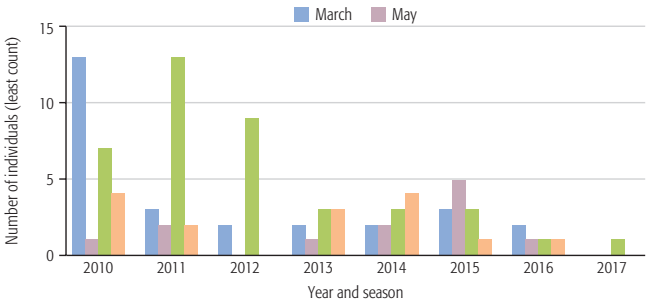

Fig. 7. Graph showing year wise decline in Great Indian Bustard in Great Indian Bustard Sanctuary, Maharashtra

Great Indian Bustard Locations: GIB1=Boramani, Taluka South Solapur, District Solapur; GIB2=Courser hill area, Nannaj, Taluka North Solapur, District Solapur; GIB3=Dahivadi-Kati, Taluka Tuljapur, District Osmanabad; GIB4=Gangewadi, Taluka South Solapur, District Solapur; GIB5=Devkuruli-Katgaon, Taluka Tuljapur, District Osmanabad; GIB6=Karamba, Taluka North Solapur, District Solapur; GIB7=Kasegao-Gangewadi, Taluka South Solapur, District Solapur; GIB8=Katgao, Taluka Tuljapur, District Osmanabad; GIB9=Kemwadi, Taluka Tuljapur, District Osmanabad; GIB10=Masla-Pangardarwadi, Taluka Tuljapur, District Osmanabad; GIB11=Nannaj, Taluka North Solapur, District Solapur; GIB12=Plantations, Behind Rest House Nannaj, Taluka North Solapur, District Solapur; GIB13=Savargao-Kemwadi, Taluka Tuljapur, District Osmanabad; GIB14=Akolekati-Mardi road, Taluka North Solapur, District Solapur; GIB15=Shelgao, Taluka Barshi, District Solapur; GIB16=Raleras=Dhamangao Taluka Barshi, District Solapur; GIB17=Lohara, Taluka Lohara, District Osmanabad; GIB18- Osmanabad, Taluka Osmanabad, District Osmanabad

Existing and proposed industrial developments: 1=Chincholi MIDC; 2- Pump house; 3=Cement Godown; 4=Proposed Domestic airport; 5=Katare Spinning mill; 6=Balajji Amines Chemical factory; 7=Stone quarries and stone crushers; 8=Solar power plant; 9=poultry industry; 10=Educational and industrial hub; 11=Textile Industry; 12=Siddheshwar sugar factory; 13=NTPC thermal power plant; 14=Zuari and Penna cement plant; 15; Jai Hind Sugar Factory; 16=Birla Cement Factory; 17=City expansion twin Solapur; 18=proposed wind mills at Devkuruli, Taluka Tuljapur, District Osmanabad (proposed); 19=proposed wind mills at Naldurga, Taluka Tuljapur, District Osmanabad (proposed); 20=Solar power plant, at Naldurga, Taluka Tulajpur, District Osmanabad; 21=proposed wind mills at Lohara, District Osmanabad (proposed); 22=GIB Sanctuary, Nananj-Mardi, District Solapur; 23- Maharashtra Industrial Development Corporation; 24=Wind mills at Yermala; District Osmanabad.

Threatened and Near Threatened species

We present detailed account on 15 IUCN Red List species that are in need of immediate protection. Grassland obligatory species that are categorized globally as of Least Concern, but are facing threats of habitat destruction, are discussed separately.

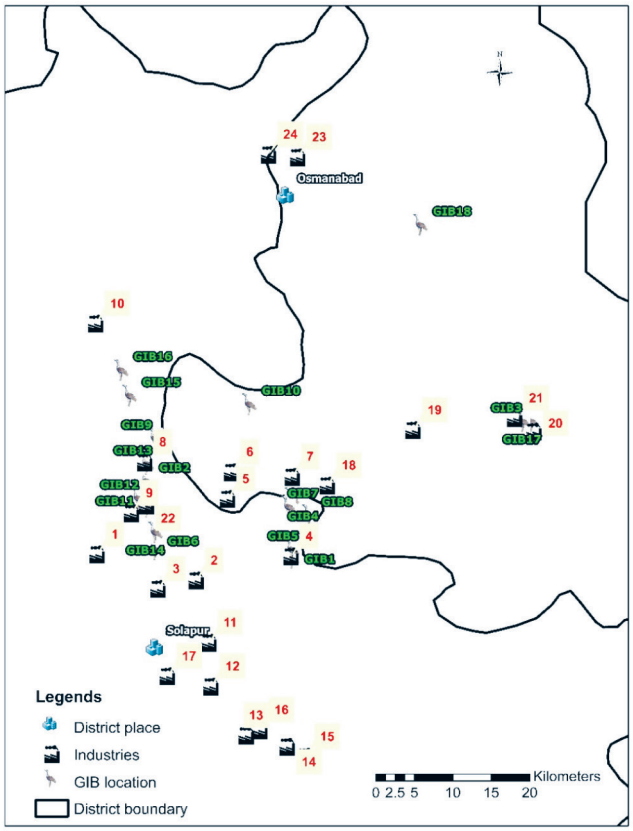

Fig. 8. Great Indian Bustard (GIB) distribution in study area and existing as well as upcoming industrial development

Endangered species

Lesser Florican *Sypheotides indicus* The Lesser Florican was occasionally seen in the Nannaj area in 1980s (Rahmani 1989). The last record of this species in the Nannaj area was in 2006 at Karmala of Solapur District (Rahmani et al. 2014). There were two instances of rescue and release of this bird from the study area: one on 19 September 2017 from Bhigwan village, Pune District (Swapnil Jared, *pers. comm*. 2017), and other on 25 November 2017 from a ground near the police headquarters, Solapur city (Mukund Shete, *pers. comm*. 2017).

Egyptian Vulture *Neophron percnopterus* A single juvenile Egyptian Vulture was sighted at Achegaon village, Solapur District in January 2012, along with two adult birds at a carcass-dump at Kanabas, southern Solapur. It was historically reported from Solapur, and part of Satara in the Deccan plateau (Davidson & Wenden 1878; Burgess 1854) when it was common in the whole state, but has now become rare (Rahmani et al. 2014).

Vulnerable species

Woolly-necked Stork *Ciconia episcopus* We observed this bird usually in groups of two to three individuals foraging in agriculture areas, shallow wetlands, and even grasslands during monsoon, while in winter, groups of 15–20 birds were seen, and occasionally up to 40 (Fig. 4).

Indian Spotted Eagle *Clanga hastata* One at Kanabas in December 2012; one at Terna Lake near Thodsarwadi village

of Osmanabad in November 2013, and one at Katgaon Lake, Tuljapur, Osmanabad in December 2014. While two birds were observed perched on power lines running in between croplands and catching the Black-headed Bunting *Emberiza melanocephala*, in February 2012 at Nannaj.

Greater Spotted Eagle *Clanga clanga* Two or three individuals were seen visiting Hipparga Lake during winter across the study period, 2011 to 2017.

Indian Skimmer *Rynchops albicollis* One bird was reported (Rahmani et al. 2014) in the winter of 2012 from the backwaters of Kurnur Dam of Akkalkot Taluka, Solapur District (Shivanand Hiremath, *pers. comm*. 2012). Burgess (1855) found four or five nests and young ones in Bheema River, probably near Ahmednagar. Butler (1881) also sighted a couple of birds on the Bheema.

Near Threatened species

Lesser Adjutant *Leptoptilos javanicus* Reported near Degaon village, Mangalvedha Road, Solapur, on 09 January 2015 (Vanjari & Vanjari 2015); but rare in the state, with very few reports from south-western Maharashtra (Rahmani et al. 2014).

Painted Stork *Mycteria leucocephala* Flocks of up to 1,000–1,200 birds were sometimes observed (Fig. 5) on large water reservoirs during summer, when a majority of lesser wetlands dried up. We observed its colonial nesting at seven sites Pingali, Man Taluka; Kurawali Lake, Phaltan Taluka Satara District; Bhadalwadi in Ujani backwaters, Indapur Taluka, Pune District; Donaj Lake, Mangalvedha Taluka; Kasegao Lake, South Solapur Taluka, Solapur District; Katgao Lake, Tuljapur Taluka, as well as Terna Lake in Osmanabad District. According to Rahmani et al. (2014) these birds are usually found in flocks of 30–40 in all major wetlands of Maharashtra.

Black-headed Ibis *Threskiornis melanocephalus* Seen at almost all major wetlands, in flocks of 10–20 birds, increasing to 50 birds at times (Fig. 3). Around 250 were seen at Bhadalwadi village area in the Ujani backwater of Pune District, and breeding colonies were recorded at Indapur and Solapur towns. Naik (1990) had earlier recorded a breeding colony in Indapur. Bharucha & Gogte (1990) reported its breeding season as March–June, in the Ujani backwaters. Burgess (1854) had reported this species in this area from before the dam was constructed.

Pallid Harrier *Circus macrourus* We observed mixed roosts of three harrier species: Montagu's Harrier *C. pygargus*, Pied Harrier *C. melanoleucos*, and Pallid Harrier, but could not count the species separately at their roost. Around 400 harriers were counted at 14 roosting sites (Table 3), and one of the largest roosts at the Great Indian Bustard Sanctuary, Nannaj, had about 250 individuals (Fig. 3). Earlier also, harriers were seen roosting in large numbers in the Nannaj bustard area of Solapur (Rahmani 1989; Kasambe & Mhaske 2011). Earlier, the Pied Harrier was rare, while Hen- and Marsh Harriers were much more common (Rahmani 1989). Davidson & Wenden (1878) considered harriers common in the Deccan and reported their arrival as early as September, and their departure by April.

Indian River Tern *Sterna aurantia* We observed them in flocks of up to 20 birds, at almost all waterbodies, and with a summer congregation of about 1,000–1,200 individuals at two drying

Table 3. List of ground roosting species and sites in Solapur- and Osmanabad Districts

No.	Species	Area/site	District	High count	Season
	Harriers (*Circus* spp., mixed species roosting)	Achegaon-Auj, Taluka South Solapur	SO	15	W
		Nilegao, Taluka South Solapur,	SO	25	W
		Boramani, South Solapur Taluka	SO	20	W
		Devkuruli-Gangewadi, Taluka South Solapur	SO	8	W
		Masla-Pangardarwadi, Taluka Tuljapur	OS	12	W
		Kasai, Taluka Tuljapur	OS	35	W
		Nannaj-Vadala-Mardi, Taluka North Solapur	SO	250	W
		Vadacha tanda–haldara tanda, Taluka Tuljapur	OS	20	W
	Lesser Sand Plover *Charadrius mongolus*	Katgao Lake, Taluka Tuljapur	OS	15	W
		Itkal-Dhangarwadi lake, Taluka Tuljapur	OS	30	W
	Oriental Pratincole *Glareola maldivarum*	Hipparga, Taluka North Solapur	SO	70	S
		Hotgi lake, Taluka South Solapur	SO	50	S
	Small Pratincole *Glareola lactea*	Hotgi lake, Taluka South Solapur	SO	150	S
	Greater/Sykes's Short-toed Lark *Calandrella brachydactyla/dukhunensis*	Boramani, Taluka South Solapur	SO	400	W
		Masla-Pangardarwadi, Taluka Tuljapur	OS	300	W
		Wadacha Tanda, Naldurga, Taluka Tuljapur	OS	2,000	W
		Nannaj, Taluka North Solapur	SO	300	W
	Sykes's Lark *Galerida deva*	Nannaj, Taluka North Solapur	SO	200	W

Legend: OS=Osmanabad, PU=Pune, SO=Solapur; S=Summer, W=Winter.

wetlands of Hipparga and Hotgi. We also observed colonies on islands in the Bhima River (Fig. 3), near Kalashi and Kumbhargao villages. This bird was also reported breeding earlier by Bradbeer (1987), Bharucha & Gogte (1990), and Bharucha et al. (1988), at Lonavla, Pune District, and by Unnithan & Unnithan (2003) in March–April from the Bhima River, Ujani Dam area.

Red-headed Falcon *Falco chicquera* We observed them in the Nannaj bustard area, usually during July–August (monsoon), and counted 11 individuals in a day-long survey in August 2010 at Nannaj and adjoining areas. In August 2014, we observed only three individuals in the same area. Nesting birds were seen at three locations, one each at Bhat Nimgao village near Akluj, Hipparga Lake area, and, near Nanduri village of Tuljapur, Osmanabad District. The species was previously reported from Ahmednagar (Burgess 1854); Solapur (Davidson & Wenden 1878; Barnes 1888); Pune (Purandare 1989)**;** Pandharpur, Mangalvedha, Mohol, Barshi, and Akkalkot Taluka of Solapur District (Mahabal 1989); Ujani area (Bharucha & Gogte 1990).

Great Thick-knee *Esacus recurvirostris* Single birds, or pairs were especially seen during summer when water level in wetlands was low at Masla, Tuljapur Taluka, Osmanabad; Hotgi Lake, South Solapur Taluka, Solapur; and Hipparga Lake, North Solapur Taluka, Solapur. During the rest of the year their sightings were rare and difficult. It was reported to breed near the Bhima River, Ahmednagar in March (Burgess 1855), while Davidson & Wenden (1876) recorded it in Solapur and Satara districts. In recent years, it was recorded from Pune (Ingalhalikar & Gole 1987; Bradbeer 1987; Purandare 1989; Mahabal & Lamba 1987).

Black-tailed Godwit *Limosa limosa* We recorded them at almost all major wetlands, normally in flocks of 20–40 birds (Fig. 4). In Maharashtra, it was earlier reported from many sites in Vidarbha, Marathwada, and along the western coast (Prasad 2004; Rahmani et al. 2014).

Note - Other species that were recorded historically in Deccan (Davidson & Wenden 1878; Mahabal 1989), and listed by Prasad (2004), such as the White-rumped Vulture *Gyps bengalensis* (Critically Endangered), Sociable Lapwing *Vanellus gregarius* (Critically Endangered), Greater Adjutant *Leptoptilos dubius* (Endangered), and Black-necked Stork *Ephippiorhynchus asiaticus* (Near Threatened) have not been seen during our study.

Status of obligate grassland birds

There is little information available about larks and other ground nesting birds (Fig. 3). The Ashy-crowned Sparrow-lark *Eremopterix griseus* breeds in summer, and at the onset of the monsoons, parents were seen feeding juveniles. They mainly forage in grassland areas, especially in the monsoon and in winters, but in summers, before breeding, these birds were observed along the edges of the waterbodies in groups of 10–30 individuals. The Rufous-tailed Lark *Ammomanes phoenicura* breeds from late summer up to the October, and the Sykes's Lark *Galerida deva*, one of the most widespread, breeds during the monsoon. The Indian Bush Lark *Mirafra erythroptera* was seen breeding soon after the onset of monsoon until the arrival of winter (Table 4). It predominantly uses grasslands and often perches at the height of 2 to 3 m, on bushes in open areas. Greater/Sykes's Short-toed Lark *Calandrella brachydactyla/dukhunensis* is migratory and is usually seen in large flocks of hundreds of birds.

The Chestnut-bellied Sandgrouse *Pterocles exustus* is usually seen in coveys of 10–15 individuals, and occasionally in congregations of about 60 birds, especially at breeding grounds (Fig. 3). No large congregations of this species were seen in the Nannaj area after year 2011. The Indian Courser *Cursorius coromandelicus* is widely distributed, but breeds mainly in undisturbed grasslands. Due to plantation work carried out under the Drought Prone Area Programme, many grassland patches have become unsuitable for ground nesting birds. We observed 70 nests of the Indian Courser in an area termed 'Courser Hill', behind the Forest Rest House in Nannaj in August 2010. Thereafter, we saw a decline of nests at that site: from 40 in 2011, 22 in 2012, 4 in 2013, and 12 in 2014. Similar decreased has been reported by Manjpara & Gadhvi (2010) in Abdasa Taluka, Kachchh, when intensive agricultural and plantation activities took place in the natural grasslands.

Communal roosting of birds

We noted communal roosts of birds, at different places in the study area in winters, summers. Two types of roosts were recorded:

Tree roosts: Tree roosts were mainly on *Acacia* sp., *Ficus* sp., *Bombax ceiba*, tamarind *Tamarindus indica*, mango *Mangifera indica*, and neem *Azadaricta indica*. Twenty-three species of birds were seen roosting on trees in our study area. Some notable large mixed species roosting sites were in Bhadalwadi, Taluka Indapur, District Pune, where *c.*10,000 Little Cormorant *Microcarbo niger*, 600 Painted Stork *Mycteria leucocephala*, and 2,000 Common Myna *Acridotheres tristis* were counted. More than 10,000 Baya Weaver were seen roosting at Ramling Yedshi, Osmanabad District, in winter. A large roost of around 100,000 Rosy Starling *Pastor roseus* was seen at Baramati, District Pune, and of more than 40,000 at Donaj, Mangalvedha, District Solapur. More than 1,000 Rose-ringed Parakeet were seen roosting on mixed species of trees at Malinagar, District Solapur (Table 5).

Ground roosts: Bustards, harriers, coursers, and larks roosted on the ground in grasslands and fallow fields. Bustards roost on the ground in relatively open areas (Rahmani 1989). Some wetland birds, such as pratincoles and sand plovers were also found roosting on ground on edges of wetlands. Mixed species roosts of harriers were seen at eight sites, with a highest count of

Table 4. Comparative account of breeding in lark species in Solapur, based on data collected in year 2013

Heading	Ashy-crowned Sparrow Lark	Rufous-tailed Lark	Syke's lark	Indian Bushlark
Breeding season	March–September	May–September	June–October	June–October
Number of nests observed in sq km area of undisturbed grassland in Nannaj–Mardi area	15	7	13	02

Table 5. List of tree roosting birds and sites in study area

S. No.	Species	Name of area	District	High Count	Season
1.	Little Cormorant *Microcarboniger*	Bhadalwadi, Taluka Indapur	PU	10000	W, S
2.	Indian Shag *Phalacrocorax fuscicollis*	Malinagar	SO	90	Year round
3.	Cattle Egret *Bubulcus ibis*	Sangavi, Taluka Baramati	PU	300	S
		Nira, Taluka Indapur	PU	500	S
		Malegaon, Taluka Baramati	PU	400	S
		Nannaj, Taluka North Solapur	SO	600	W, S
		Nimgao, Malshiras	SO	400	W
		Mangalvedha	SO	800	S
		Solapur town (Rupa Bhavani temple area)	SO	400	R
4.	Grey Heron *Ardea cinerea*	Bhadalwadi, Taluka Indapur	PU	90	W, S
5.	Pond Heron *Ardeola grayii*	Mangalvedha	SO	40	S
6.	Little Egret *Egretta garzetta*	Nimgao, Malshiras	SO	50	W
		Mangalvedha	SO	40	S
		Solapur town (Rupa Bhavani temple area)	SO	50	R
7.	Black-crowned Night Heron *Nycticorax nycticorax*	Bhadalwadi, Indapur Taluka	PU	15	R
		Nimgao, Malshiras	SO	35	R
8.	Painted Stork *Mycteria leucocephala*	Bhadalwadi, Indapur Taluka,	PU	600	W, S
		Indapur town	PU	600	W, S
9.	Black-headed Ibis *Threskiornis melanocephalus*	Bhadalwadi, Taluka Indapur	PU	34	W, S
		Solapur town (Rupa Bhavani temple area)	SO	75	R
10.	Red-naped Ibis *Pseudibis papillosa*	Mangalvedha	SO	34	S
11.	Brahminy Kite *Haliastur Indus*	Plantation, Hotgi lake	SO	23	W
12.	Black Kite *Milvus migrans*	Smruti Udyan, Solapur	SO	60	S
		Baramati town	PU	300	W, S
13.	Rose-ringed Parakeet *Psittacula krameri*	Malinagar	SO	3,000	W, S
		Mangalvedha	SO	500	S
		Solapur town (Rupa Bhavani temple area)	SO	200	R
		Near Hotel Vikram palace, Solapur town	SO	70	W, S
14.	Red-vented Bulbul *Pycnonotus cafer*	Nimgao, Malshiras	SO	70	W
15.	Green Bee-eater *Merops orientalis*	Plantations, Behind Rest House Nannaj	SO	400	W
		Akolekati-Mardi road, Great Indian Bustard Sanctuary area	SO	300	W
		Shiradhon, Tuljapur	SO	70	W
16.	Black-headed Bunting *Emberiza melanocephala*	Rupa Bhavani temple, Solapur town	SO	500	W
17.	Red-headed Bunting *Emberiza bruniceps*	Achegao-Auj, South Solapur	SO	400	W
		Mangalvedha	SO	300	W
18.	House Sparrow *Passer domesticus*	Karamba	SO	500	W
		Old abandoned house, Balives area, Solapur city	SO	400	W
		Kasegao-Gangewadi, Taluka South Solapur	SO	300	W
19.	Baya Weaver *Ploceus philippinus*	RamlingYedshi, Taluka Osmanabad	OS	10,000	S
20.	Common Myna *Acridotheres tristis*	Bhadalwadi, Taluka Indapur	PU	2,000	W, S
		Nimgao, Malshiras	SO	50	W
		Mangalvedha, District	SO	65	S
		Solapur town (Rupa Bhavani temple area)	SO	60	R
		Hanuman Nagar, Solapur town	SO	400	W, S
21.	Rosy Starling *Pastor roseus*	Malinagar, Malshiras	SO	3,000	W, S
		Nimgao, Malshiras	SO	5,000	W
		Donaj, Mangalvedha	SO	40,000	W, S
		Solapur town (Rupa Bhavani temple area)	SO	10,000	R
		Near Hotel Vikram palace, Solapur	SO	1000	W, S
		Baramati	PU	1,00,000	W, S
22.	Brahminy Myna *Sturnia pagodarum*	Mangalvedha	SO	100	W, S
23.	House Crow *Corvus splendens*	Mangalvedha	SO	250	S
		Smriti Udyan, Solapur	SO	40	S
		Near Hotel Vikram palace, Solapur town	SO	150	W, S
		Solapur (Rupa Bhavani temple area)	SO	40	R

Legend: OS=Osmanabad, PU=Pune, SAT=Satara, SO=Solapur; R=Regular, S=Summer, W=Winter

250 birds at of Nannaj-Mardi and lowest, of eight, at Devkuruli-Gangewadi, South Solapur, District Solapur. We also found a large roost of more than 2,000 Greater/Sykes's Short-toed Larks at Wadacha Tanda, Naldurga, District Osmanabad (Table 3).

Conservation challenges for birds and their habitats

We focused our attention on mapping conservation challenges of grassland species around the core area of the Great Indian Bustard Sanctuary.. We surveyed 14 grassland patches of more than 300 ha as a basis for compiling information on current land use and upcoming development projects on each area, development proposed, and projects in progress (Fig. 8). The extent of existing and, on-going developments, and proposed industries indicates great pressure on the remaining grassland habitat (Fig. 8). We saw that except for two protected areas of the Great Indian Bustard Sanctuary, and three non-protected areas, some form of development is proposed on all grassland patches (Fig. 8). Below we list our concerns regarding the survival of grasslands in the study areas.

1. In South Solapur, apart from an existing grinding unit of Grasim Cement, two new cement plants became operational from year 2017 (#14 and 16, Fig. 8). These include mining, transport of limestone, and cement bags (#3, Fig. 8). Grinding and mixing of additives for different cement grades will also have an impact on biodiversity due to the spreading of dust and other cement particles.
2. The Solapur Supercritical Thermal Power Plant was proposed at Fatatewadi village of South Solapur (#13, Fig. 8) in 2010. The Power Plant is operational now and drawing water from the Ujani Reservoir, which is 150 km away. A network of high-tension wires surrounds it. Fly ash and bottom ash, which are released during operations, will negatively impact existing avifauna.
3. A large number of sugar factories have come up during the last two decades. This means more the withdrawal of groundwater for growing sugarcane, and a decrease of the traditional crop, which is more suitable to the semi-arid climate. Though many sugarcane factories claim to have effluent treatment plants, we have observed slurry and molasses being released into the streams and rivers, which affects the aquatic life of Bhima River and its tributaries.
4. Three roads, Solapur–Pune (250 km), Solapur–Yedshi (100 km), and Solapur–Hyderabad highway (300 km) were widened into four-lane express highways after felling a large number of roadside trees, and extraction of soil from adjoining areas, for land filling.
5. The Government of Maharashtra (ttps://maharashtra.mygov.in/en/group/mission-plantation/) launched a massive plantation drive during which 3 million trees were purportedly planted, mainly in open areas and grasslands. This has resulted in loss of native flora and dependent fauna.
6. An increase in the number of illegal/legal stone quarries and stone crushers are also reducing the potential grassland habitats and affecting flora and fauna because of mining, dust, noise, blasting, and movement of trucks and people.
7. On hundreds of square kilometres, the installation of windmills and solar plants is underway, and many more are proposed. This has already destroyed habitat, displaced wild birds, and increased exotic and invasive species. Now there are greater chances of injury and death to birds due to collision with power lines [Avian Power Line Interaction Committee (APLIC) 2012; Narwade et al. 2013].

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Appendix 1. List of birds recorded in south-western Deccan Plateau region of Maharashtra, India. [W=wetland, OA=open area, and RC=rocky cliff.]

Sr. no.	Species	Habitat	Encounter rate/h: Winter	Encounter rate/h: Summer	Encounter rate/h: Monsoon
1	Lesser Whistling Duck *Dendrocygna javanica*	W	1.21 (±0.63)	2.45 (±1.45)	0.25 (±0.18)
2	Bar-headed Goose *Anser indicus*	W	1.92 (±1.06)	-	-
3	Greylag Goose *Anser anser*	W	[1]	-	-
4	Knob-billed Duck *Sarkidiornis melanotos*	W	1.04 (±0.65)	-	0.42 (±0.14)
5	Ruddy Shelduck *Tadorna ferruginea*	W	0.75 (±1.02)	-	-
6	Cotton Teal *Nettapus coromandelianus*	W	0.63 (±0.51)	0.08 (±0.12)	-
7	Garganey *Spatula querquedula*	W	3.08 (±2.05)	-	-
8	Northern Shoveler *Spatula clypeata*	W	0.25 (±0.44)	-	-
9	Gadwall *Mareca strepera*	W	0.29 (±0.31_	-	-
10	Eurasian Wigeon *Mareca penelope*	W	1.46 (±0.43)	-	-
11	Indian Spot-billed Duck *Anas poecilorhyncha*	W	5.35 (±4.52)	7.12 (±4.02)	2.34 (±1.76)
12	Mallard *Anas platyrhynchos*	W	0.45 (±0.22)	-	-
13	Northern Pintail *Anas acuta*	W	1.46 (±0.56)	-	-
14	Common Teal *Anas crecca*	W	8.33 (±3.45)	-	-
15	Common Pochard *Aythya ferina*	W	0.65 (±0.54)	-	-
16	Tufted Duck *Aythya fuligula*	W	0.43 (±0.15)	-	-
17	Indian Peafowl *Pavo cristatus*	OA	1.21 (±0.77)	0.54 (±0.40)	0.90 (±0.36)
18	Rain/Common *Quail Coturnix coromandelica/coturnix*	OA	0.95 (±0.70)	0.86 (±(0.63)	1.02 (±0.96)
19	Jungle Bush Quail *Perdicula asiatica*	OA	0.61 (±0.25)	0.35 (±016)	0.81 (±0.33)
20	Rock Bush Quail *Perdicula argoondah*	OA	0.63 (±0.17)	0.82 (±0.58)	0.85 (±0.81)
21	Painted Francolin *Francolinus pictus*	OA	0.51 (±0.49)	0.45 (±0.33)	0.54 (±0.37)
22	Grey Francolin *Francolinus pondicerianus*	OA	2.13 (±0.54)	2.69 (±0.65)	1.64 (±1.45)
23	Greater Flamingo *Phoenicopterus roseus*	W	3.5 (±2.77)	-	-
24	Lesser Flamingo *Phoeniconaias minor*	W	[1]	-	-
25	Little Grebe *Tachybaptus ruficollis*	W	1.29 (±0.67)	0.23 (±0.34)	0.46 (±0.21)
26	Rock Pigeon *Columba livia*	OA	9.25 (±3.54)	4.16 (±1.41)	3.32 (±2.7)
27	Eurasian Collared Dove *Streptopelia decaocto*	OA	6.83 (±4.70)	6.20 (±7.72)	2.98 (±3.82)

Appendix 1. List of birds recorded in south-western Deccan Plateau region of Maharashtra, India. [W=wetland, OA=open area, and RC=rocky cliff.]

Sr. no.	Species	Habitat	Encounter rate/h: Winter	Encounter rate/h: Summer	Encounter rate/h: Monsoon
28	Red Collared Dove *Streptopelia tranquebarica*	OA	0.09 (±0.61)	-	0.03 (±0.04)
29	Spotted Dove *Streptopelia chinensis*	OA	[1]	-	-
30	Laughing Dove *Streptopelia senegalensis*	OA	7.95 (±1.98)	2.58 (±1.30)	8.25 (±4.31)
31	Yellow-footed Green Pigeon *Treron phoenicopterus*	OA	0.57 (±0.31)	0.29 (±0.35)	-
32	Chestnut-bellied Sandgrouse *Pterocles exustus*	OA	0.89 (±0.23)	0.29 (±0.57)	±
33	Great Indian Bustard *Ardeotis nigriceps*	OA	T-	-	-
34	Lesser Florican *Sypheotides indicus*	OA	-	-	T
35	Greater Coucal *Centropus sinensis*	OA	1.04 (±0.55)	0.32 (±0.46)	0.52 (±0.33)
36	Sirkeer Malkoha *Taccocua leschenaultii*	OA	-	[1]	[2]
37	Blue-faced Malkoha *Phaenicophaeus viridirostris*	OA	-	-	[2]
38	Pied Cuckoo *Clamator jacobinus*	OA	0.14 (±0.09)	-	0.35 (±0.14)
39	Asian Koel *Eudynamys scolopaceus*	OA	0.58 (±0.16)	0.53 (±0.41)	0.70 (±0.12)
40	Grey-bellied Cuckoo *Cacomantis passerinus*	OA	0.45 (±0.23)	-	0.51 (±0.68)
41	Common Hawk Cuckoo *Hierococcyx varius*	OA	0.89 (±1.01)	0.21 (±0.08)	0.47 (±0.22)
42	Indian Cuckoo *Cuculus micropterus*	OA	[1]	-	[2]
43	Jungle Nightjar *Caprimulgus indicus*	OA	Regularly in dry deciduous plantations, mainly calls in evening	-	-
44	Indian Nightjar *Caprimulgus asiaticus*	OA	-	[3], mainly calls	-
45	Indian House Swift *Apus affinis*	OA	8.12 (±6.57)	4.45 (±3.71)	2.12 (±1.68)
46	Asian Palm Swift *Cypsiurus balasiensis*	OA	1.41 (±0.42)	1.16 (±1.21)	0.67 (±0.14)
47	Common Moorhen *Gallinula chloropus*	W	0.13 (±0.16)	0.06 (±0.04)	0.28 (±0.07)
48	Common Coot *Fulica atra*	W	12.5 (±3.62)	1.1 (±0.25)	6.20 (±8.33)
49	Grey-headed Swamphen *Porphyrio poliocephalus*	W	0.54 (±0.17)	0.20 (±0.63)	0.08 (±0.02)
50	White-breasted Waterhen *Amaurornis phoenicurus*	W	0.13 (±0.15)	-	0.85 (±0.03)
51	Brown Crake *Zapornia akool*	W	-	[1]	-
52	Demoiselle Crane *Grus virgo*	OA	0.45 (±0.60)	-	-
53	Common Crane *Grus grus*	OA	1.25 (±0.81)	-	-
54	Indian Thick-knee *Burhinus indicus*	OA	0.12 (±0.21)	0.15 (±0.34)	0.16 (±0.45)
55	Great Thick-knee *Esacus recurvirostris*	W	-	[1]	[3]
56	Black-winged Stilt *Himantopus himantopus*	W	2.88 (±1.75)	1.04 (±0.67)	1.5 (±0.81)
57	Pacific Golden Plover *Pluvialis fulva*	W	[1]	-	-
58	Yellow-wattled Lapwing *Vanellus malabaricus*	OA	1.07 (±0.54)	1.16 (±0.89)	1.04 (±0.62)
59	Red-wattled Lapwing *Vanellus indicus*	W	0.25 (±0.34)	2.75 (±1.62)	1.21 (±1.02)
60	Lesser Sand Plover *Charadrius mongolus*	W	[1]	-	-
61	Kentish Plover *Charadrius alexandrinus*	W	1.25 (±0.65)	0.06 (±0.15)	-
62	Little Ringed Plover *Charadrius dubius*	W	2.25 (±1.41)	0.25 (±0.45)	0.05 (±0.06)
63	Greater Painted-snipe *Rostratula benghalensis*	W	0.04 (±0.16)	-	0.21 (±0.08)
64	Pheasant-tailed Jacana *Hydrophasianus chirurgus*	W	0.16 (±0.37)	-	0.83 (±0.67)
65	Bronze-winged Jacana *Metopidius indicus*	OA	0.12 (±0.25)	0.05 (±0.08)	0.25 (±0.15)
66	Whimbrel *Numenius phaeopus*	W	[1]	-	-
67	Black-tailed Godwit *Limosa limosa*	W	T	-	-
68	Ruff *Calidris pugnax*	W	[3]	-	-
69	Temminck's Stint *Calidris temminckii*	W	[1]	-	-
70	Little Stint *Calidris minuta*	W	0.70 (±0.83)	-	-
71	Common Snipe *Gallinago gallinago*	W	[1]	-	-

Appendix 1. List of birds recorded in south-western Deccan Plateau region of Maharashtra, India. [W=wetland, OA=open area, and RC=rocky cliff.]

Sr. no.	Species	Habitat	Encounter rate/h: Winter	Encounter rate/h: Summer	Encounter rate/h: Monsoon
72	Common Sandpiper *Actitis hypoleucos*	W	1.33 (±0.33)	-	-
73	Spotted Redshank *Tringa erythropus*	W	0.04 (±0.01)	-	-
74	Common Greenshank *Tringa nebularia*	W	0.09 (±0.06)	-	-
75	Marsh Sandpiper *Tringa stagnatilis*	W	0.12 (±0.5)	-	-
76	Wood Sandpiper *Tringa glareola*	W	0.83 (±0.25)	-	-
77	Common Redshank *Tringa totanus*	W	0.63 (±0.13)	-	-
78	Small Buttonquail *Turnix sylvaticus*	OA	[1]	[1]	[1]
79	Yellow-legged Buttonquail *Turnix tanki*	OA	[2]	[1]	[2]
80	Barred Buttonquail *Turnix suscitator*	OA	0.71 (±0.13)	1.06 (±0.89)	1.33 (±0.57)
81	Indian Courser *Cursorius coromandelicus*	OA	0.57 (±0.35)	0.61 (±0.26)	1.47 (±1.29)
82	Oriental Pratincole *Glareola maldivarum*	W	0.84 (±1.2)	0.65 (±0.41)	0.13 (±0.06)
83	Small Pratincole *Glareola lactea*	W	4.58 (±3.83)	0.80 (±0.54)	1.75 (±1.13)
84	Black-headed Gull *Chroicocephalus ridibundus*	W	0.25 (±0.34)	-	-
85	Brown-headed Gull *Chroicocephalus brunnicephalus*	W	1.08 (±0.58)	-	-
86	Little Tern *Sternula albifrons*	W	0.25 (±0.62)	0.62 (±1.20)	-
87	Gull-billed Tern *Gelochelidon nilotica*	W	[1]	-	-
88	Caspian Tern *Hydroprogne caspia*	W	[1]	-	-
89	Whiskered Tern *Chlidonias hybrida*	W	1.84 (±1.20)	-	-
90	River Tern *Sterna aurantia*	W	12.92 (±7.6)	1.62 (±2.3)	0.38 (±1.4)
91	Asian Openbill *Anastomus oscitans*	W	0.63 (±0.24)	-	0.92 (±0.36)
92	Black Stork *Ciconia nigra*	W	[2]	-	-
93	Woolly-necked Stork *Ciconia episcopus*	W	0.41 (±0.54)	0.18 (±0.07)	0.50 (±0.76)
94	European White Stork *Ciconia ciconia*	W	[1]	-	-
95	Painted Stork *Mycteria leucocephala*	W	3.75 (±2.34)	1.05 (±0.71)	0.83 (±0.45)
96	Oriental Darter *Anhinga melanogaster*	W	0.04 (±0.07)	0.02 (±0.05)	0.08 (±0.03)
97	Little Cormorant *Microcarbo niger*	W	2.29 (±1.06)	0.42 (±0.19)	1.21 (±0.75)
98	Great Cormorant *Phalacrocorax carbo*	W	0.57 (±0.45)	0.21 (±0.07)	0.53 (±0.65)
99	Indian Cormorant *Phalacrocorax fuscicollis*	W	1.25 (±0.51)	0.17 (±0.08)	0.79 (±0.48)
100	Yellow Bittern *Ixobrychus sinensis*	W	-	-	[2]
101	Cinnamon Bittern *Ixobrychus cinnamomeus*	W	-	-	[1]
102	Grey Heron *Ardea cinerea*	W	0.25 (±0.16)	0.21 (±0.32)	0.29 (±0.23)
103	Purple Heron *Ardea purpurea*	W	0.26 (±0.34)	-	0.29 (±0.18)
104	Great Egret *Ardea alba*	W	1.61 (±0.65)	0.22 (±0.17)	0.41 (±0.34)
105	Intermediate Egret *Ardea intermedia*	W	1.41 (±0.46)	0.21 (±0.31)	0.08 (±0.02)
106	Little Egret *Egretta garzetta*	W	1.92 (±1.23)	0.63 (±0.45)	1.25 (±0.86)
107	Cattle Egret *Bubulcus ibis*	W	4.37 (±3.25)	6.08 (±4.95)	7.25 (±5.06)
108	Indian Pond Heron *Ardeola grayii*	W	0.75 (±1.06)	0.46 (±0.51)	0.69 (±0.43)
109	Black-crowned Night Heron *Nycticorax nycticorax*	W	[4]	-	-
110	Glossy Ibis *Plegadis falcinellus*	W	0.29 (±0.45)	0.08 (±0.23)	0.17 (±0.21)
111	Black-headed Ibis *Threskiornis melanocephalus*	W	3.13 (±1.32)	1.09 (±0.88)	1.29 (±o.65)
112	Red-naped Ibis *Pseudibis papillosa*	OA	1.04 (±0.73)	1.85 (±1.12)	3.29 (±2.07)
113	Eurasian Spoonbill *Platalea leucorodia*	W	4.17 (±2.08)	1.34 (±0.65)	1.63 (±1.04)
114	Osprey *Pandion haliaetus*	OA	[2]	-	-
115	Black-winged Kite *Elanus caeruleus*	OA	0.41 (±0.32)	0.40 (±0.18)	0.26 (±0.13)
116	Egyptian Vulture *Neophron percnopterus*	OA	[1]	-	-
117	Oriental Honey Buzzard *Pernis ptilorhynchus*	OA	[2]	-	-

Appendix 1. List of birds recorded in south-western Deccan Plateau region of Maharashtra, India. [W=wetland, OA=open area, and RC=rocky cliff.]

Sr. no.	Species	Habitat	Encounter rate/h: Winter	Encounter rate/h: Summer	Encounter rate/h: Monsoon
118	Crested Serpent Eagle *Spilornis cheela*	OA	[2]	-	-
119	Short-toed Snake Eagle *Circaetus gallicus*	OA	0.17 (±0.08)	-	0.14 (±0.15)
120	Indian Spotted Eagle *Clanga hastata*	OA	T	-	-
121	Greater Spotted Eagle *Clanga clanga*	OA	T	-	-
122	Booted Eagle *Hieraaetus pennatus*	OA	[1]	-	-
123	Tawny Eagle *Aquila rapax*	OA	[2]	-	-
124	Bonelli's Eagle *Aquila fasciata*	OA	0.58 (±0.28)	0.12 (±0.02)	0.26 (±0.13)
125	White-eyed Buzzard *Butastur teesa*	OA	0.22 (±0.08)	0.17 (±0.09)	0.12 (±0.06)
126	Western Marsh Harrier *Circus aeruginosus*	W	0.12 (±0.04)	-	-
127	Pallid Harrier *Circus macrourus*	OA	0.69 (±0.33)	-	-
128	Pied Harrier *Circus melanoleucos*	OA	[2]	-	-
129	Montagu's Harrier *Circus pygargus*	OA	0.52 (±0.25)	-	0.42 (±0.33)
130	Shikra *Accipiter badius*	OA	0.12 (±0.16)	0.02(±0.13)	0.48 (±0.22)
131	Eurasian Sparrowhawk *Accipiter nisus*	OA	[1]	-	-
132	Black Kite *Milvus migrans*	OA	0.69 (±0.13)	0.16 (±0.09)	0.58 (±0.84)
133	Brahminy Kite *Haliastur indus*	OA	0.21 (±0.09)	0.06 (±0.12)	±
134	Common Buzzard *Buteo buteo*	OA	[2]	-	-
135	Long-legged Buzzard *Buteo rufinus*	OA	[1]	-	-
136	Common Barn Owl *Tyto alba*	OA	Regularly near human habitation	-	-
137	Indian Eagle Owl *Bubo bengalensis*	OA	[3] near tunnels, old wells in farmlands	-	-
138	Spotted Owlet *Athene brama*	OA	Regularly and widely	-	-
139	Mottled Wood Owl *Strix ocellata*	OA	[1]	-	[1]
140	Short-eared Owl *Asio flammeus*	OA	[2]	-	-
141	Common Hoopoe *Upupa epops*	OA	0.63 (±0.37)	0.09 (±0.07)	-
142	Indian Grey Hornbill *Ocyceros birostris*	OA	0.13 (±0.21)	0.21 (±0.17)	0.49 (±0.14)
143	Common Kingfisher *Alcedo atthis*	W	[4]	-	-
144	White-throated Kingfisher *Halcyon smyrnensis*	W	0.37 (±0.16)	0.52 (±0.32)	0.41 (±0.67)
145	Pied Kingfisher *Ceryle rudis*	W	0.37 (±0.51)	0.08 (±0.04)	0.12 (±0.05)
146	Green Bee-eater *Merops orientalis*	OA	3.58 (±2.16)	3.29 (±1.92)	1.18 (±0.09)
147	Blue-tailed Bee-eater *Merops philippinus*	OA	[1]	-	-
148	European Roller *Coracias garrulus*	OA	0.27 (±0.09)		0.15 (±0.11)
149	Indian Roller *Coracias benghalensis*	OA	1.02 (±0.41)	0.62 (±0.73)	0.13 (±0.11)
150	Coppersmith Barbet *Psilopogon haemacephalus*	OA	0.26 (±0.07)	0.12 (±0.13)	0.08 (±0.09)
151	Brown-headed Barbet *Psilopogon zeylanicus*	OA	[1]	-	-
152	Eurasian Wryneck *Jynx torquilla*	OA	[2]	-	-
153	Yellow-fronted Woodpecker *Leiopicus mahrattensis*	OA	0.08 (±0.12)	0.07 (±0.20)	0.03 (±0.05)
154	Common Kestrel *Falco tinnunculus*	OA	0.35 (±0.14)	-	-
155	Red-necked Falcon *Falco chicquera*	OA	0.21 (±0.15)	-	0.13 (±0.09)
156	Laggar Falcon *Falco jugger*	OA	[1]	-	-
157	Peregrine Falcon *Falco peregrinus*	OA	[1]	-	-
158	Rose-ringed Parakeet *Psittacula krameri*	OA	2.08 (±1.68)	4.95 (±3.49)	0.43 (±0.83)
159	Plum-headed Parakeet *Psittacula cyanocephala*	OA	0.95 (±0.82)	1.62 (±1.08)	-
160	Indian Pitta *Pitta brachyura*	OA	[1]	-	-
161	Small Minivet *Pericrocotus cinnamomeus*	OA	0.82 (±1.34)	0.43 (±0.56)	0.71 (±0.37)
162	Large Cuckooshrike *Coracina macei*	OA	0.14 (±0.91)	-	-

Appendix 1. List of birds recorded in south-western Deccan Plateau region of Maharashtra, India. [W=wetland, OA=open area, and RC=rocky cliff.]

Sr. no.	Species	Habitat	Encounter rate/h: Winter	Encounter rate/h: Summer	Encounter rate/h: Monsoon
163	Indian Golden Oriole *Oriolus kundoo*	OA	0.35 (±0.14)	-	0.21 (±0.13)
164	Common Woodshrike *Tephrodornis pondicerianus*	OA	0.25 (±0.15)	0.64 (±0.41)	0.34 (±0.15)
165	Common Iora *Aegithina tiphia*	OA	0.21 (±0.09)	0.34 (±0.37)	0.23 (±0.14)
166	Spot-breasted Fantail *Rhipidura albogularis*	OA	[1]	-	-
167	White-browed Fantail *Rhipidura aureola*	OA	0.57 (±0.14)	0.08 (±0.06)	0.38 (±0.67)
168	Black Drongo *Dicrurus macrocercus*	OA	6.76 (±1.99)	1.58 (±0.83)	0.54 (±0.33)
169	Indian Paradise-flycatcher *Terpsiphone paradisi*	OA	[3]	-	-
170	Isabelline Shrike *Lanius isabellinus*	OA	[2]	-	-
171	Bay-backed Shrike *Lanius vittatus*	OA	0.27 (±0.62)	0.44 (±0.25)	0.51 (±0.22)
172	Long-tailed Shrike *Lanius schach*	OA	1.04 (±0.21)	0.79 (±0.33)	0.66 (±0.36)
173	Great Grey Shrike *Lanius excubitor*	OA	0.54 (±0.41)	0.66 (±0.35)	0.40 (±0.29)
174	Rufous Treepie *Dendrocitta vagabunda*	OA	0.23 (±0.17)	0.09 (±0.02))	-
175	House Crow *Corvus splendens*	OA	1.32 (±1.05)	3.18 (±2.91)	0.57 (±0.29)
176	Large-billed Crow *Corvus macrorhynchos*	OA	0.49 (±0.28)	0.24 (±0.12)	0.22 (±0.81)
177	Grey-headed Canary-flycatcher *Culicicapa ceylonensis*	OA	[2]	-	-
178	Cinereous Tit *Parus cinereus*	OA	0.17 (±0.14)	0.15 (±0.13)	0.21 (±0.15)
179	Indian Black-lored Tit *Machlolophus aplonotus*	OA	[1]	-	-
180	Rufous-tailed Lark *Ammomanes phoenicura*	OA	2.45 (±2.06)	0.86 (±0.87)	3.82 (±0.72)
181	Ashy-crowned Sparrow Lark *Eremopterix griseus*	OA	1.43 (±0.78)	0.83 (±0.37)	0.88 (±0.50)
182	Indian Bushlark *Mirafra erythroptera*	OA	0.54 (±0.40)	0.77 (±0.19)	0.95 (±0.41)
183	Sykes's/Greater Short-toed Lark *Calandrella dukhunensis/brachydactyla*	OA	17.87 (±14.21)	-	-
184	Oriental Skylark *Alauda gulgula*	OA	-	[2]	-
185	Sykes's Lark *Galerida deva*	OA	2.08 (±1.31)	2.16 (±0.67)	4.83 (±1.91)
186	Common Tailorbird *Orthotomus sutorius*	OA	0.37 (±0.62)	1.12 (±0.25)	0.51 (±0.21)
187	Grey-breasted Prinia *Prinia hodgsonii*	OA	0.17 (±0.09)	0.32 (±0.08)	0.70 (±0.21)
188	Jungle Prinia *Prinia sylvatica*	OA	[2]	-	-
189	Ashy Prinia *Prinia socialis*	OA	1.12 (±0.41)	0.89 (±1.13)	1.34 (±1.42)
190	Plain Prinia *Prinia inornata*	OA	4.16 (±1.54)	3.54 (±1.66)	3.75 (±1.2)
191	Zitting Cisticola *Cisticola juncidis*	OA	0.83 (±0.37)	0.70 (±0.21)	0.51 (±0.26)
192	Blyth's Reed Warbler *Acrocephalus dumetorum*	OA	1.09 (±0.34)	-	-
193	Clamorous Reed Warbler *Acrocephalus stentoreus*	OA	0.07 (±0.05)	-	0.06 (±0.04)
194	Barn Swallow *Hirundo rustica*	OA	4.78 (±2.17)	-	-
195	Wire-tailed Swallow *Hirundo smithii*	OA	1.87 (±1.62)	3.65 (±1.87)	2.1 (±1.21)
196	Red-rumped Swallow *Cecropis daurica*	OA	2.51 (±1.91)	1.62 (±0.55)	0.71 (±0.62)
197	Streak-throated Swallow *Petrochelidon fluvicola*	OA	[3]	-	-
198	Red-vented Bulbul *Pycnonotus cafer*	OA	8.41 (±1.39)	4.09 (±1.89)	8.41 (±0.91)
199	Red-whiskered Bulbul *Pycnonotus jocosus*	OA	[1]	-	-
200	White-browed Bulbul *Pycnonotus luteolus*	OA	[1]	-	-
201	Sulphur-bellied Warbler *Phylloscopus griseolus*	RC	[2]	-	-
202	Lesser Whitethroat *Sylvia curruca*	OA	1.06 (±0.35)	-	-
203	Yellow-eyed Babbler *Chrysomma sinense*	OA	0.92 (±0.89)	1.41 (±0.72)	1.05 (±1.34)
204	Indian White-eye *Zosterops palpebrosus*	OA	0.24 (±0.14)	-	-
205	Tawny-bellied Babbler *Dumetia hyperythra*	OA	Only twice	-	-
206	Jungle Babbler *Argya striata*	OA	[2]	[1]	-
207	Yellow-billed Babbler *Argya affinis*	OA	-	[1]	[2]
208	Common Babbler *Argya caudata*	OA	0.20 (±0.07)	0.31 (±0.10)	0.63 (±0.42)

Appendix 1. List of birds recorded in south-western Deccan Plateau region of Maharashtra, India. [W=wetland, OA=open area, and RC=rocky cliff.]

Sr. no.	Species	Habitat	Encounter rate/h: Winter	Encounter rate/h: Summer	Encounter rate/h: Monsoon
209	Large Grey Babbler *Argya malcolmi*	OA	5.6 (±1.38)	6.20 (±1.84)	4.04 (±2.69)
210	Common Starling *Sturnus vulgaris*	OA	[1]	-	-
211	Rosy Starling *Pastor roseus*	OA	43.56 (±30.12)	3.32 (±2.06)	-
212	Brahminy Starling *Sturnia pagodarum*	OA	2.02 (±1.83)	2.95 (±2.72)	1.23 (±0.42)
213	Common Myna *Acridotheres tristis*	OA	4.05 (±2.08)	6.66 (±1.63)	1.45 (±1.16)
214	Orange-headed Thrush *Geokichla citrina*	OA	[3]	-	-
215	Indian Blackbird *Turdus simillimus*	OA	[1]	-	-
216	Asian Brown Flycatcher *Muscicapa dauurica*	OA	0.03 (±0.01)	-	-
217	Indian Robin *Copsychus fulicatus*	OA	1.62 (±0.65)	1.41 (±0.56)	1.25 (±0.77)
218	Oriental Magpie Robin *Copsychus saularis*	OA	0.08 (±0.09)	-	0.16 (±0.14)
219	Tickell's Blue Flycatcher *Cyornis tickelliae*	OA	[1]	-	-
220	Bluethroat *Luscinia svecica*	OA	0.21 (±0.09)	-	-
221	Red-breasted Flycatcher *Ficedula parva*	OA	0.05 (±0.03)	-	-
222	Black Redstart *Phoenicurus ochruros*	OA	035 (±0.14)	-	-
223	Blue Rock Thrush *Monticola solitarius*	OA	0.084 (±0.02)	-	-
224	Siberian Stonechat *Saxicola maurus*	OA	2.57 (±1.42)	-	-
225	Pied Bushchat *Saxicola caprata*	OA	1.51 (±0.43)	1.20 (±0.84)	0.91 (±0.38)
226	Isabelline Wheatear *Oenanthe isabellina*	OA	[1]	-	-
227	Desert Wheatear *Oenanthe deserti*	OA	[1]	-	-
228	Thick-billed Flowerpecker *Dicaeum agile*	OA	[1]	-	-
229	Pale-billed Flowerpecker *Dicaeum erythrorhynchos*	OA	[1]	-	-
230	Purple-rumped Sunbird *Leptocoma zeylonica*	OA	0.19 (±0.13)	0.12 (±0.07)	0.37 (±0.16)
231	Purple Sunbird *Cinnyris asiaticus*	OA	1.47 (±0.38)	0.56 (±0.24)	0.12 (±0.09)
232	Baya Weaver *Ploceus philippinus*	OA	9.03 (±5.32)	4.06 (±2.23)	11.09 (±6.92)
233	Red Munia *Amandava amandava*	OA	3.41 (±3.05)	3.87 (±2.12)	1.51 (±1.07)
234	Indian Silverbill *Euodice malabarica*	OA	5.4 (±4.7)	2.33 (±5.87)	8.83 (±5.8)
235	Scaly-breasted Munia *Lonchura punctulata*	OA	6.39 (±1.71)	2.97 (±1.70)	7.71 (±2.29)
236	Tricoloured Munia *Lonchura malacca*	OA	3.69 (±1.42)	1.21 (±0.87)	1.17 (±1.41)
237	House Sparrow *Passer domesticus*	OA	7.75 (±6.33)	0.70 (±0.63)	1.83 (±1.52)
238	Yellow-throated Sparrow *Gymnoris xanthocollis*	OA	5.66 (±2.43)	3.7 (±2.6)	-
239	Forest Wagtail *Dendronanthus indicus*	OA	Present	-	-
240	Grey Wagtail *Motacilla cinerea*	W	1.38 (±0.79)	-	-
241	Western Yellow Wagtail *Motacilla flava*	W	4.04 (±1.29)	-	-
242	Citrine Wagtail *Motacilla citreola*	W	0.13 (±0.42)	-	-
243	White-browed Wagtail *Motacilla maderaspatensis*	W	0.94 (±0.55)	[2]	[3]
244	White Wagtail *Motacilla alba*	W	0.61 (±0.23)	-	-
245	Richard's/Blyth's Pipit *Anthus richardi/godlewskii*	OA	2.37 (±3.18)	-	-
246	Paddyfield Pipit *Anthus rufulus*	OA	1.79 (±0.69)	0.58 (±0.76)	0.49 (±0.61)
247	Tawny Pipit *Anthus campestris*	OA	[1]	-	-
248	Tree Pipit *Anthus trivialis*	OA	[4]	-	-
249	Olive-backed Pipit *Anthus hodgsoni*	OA	0.58 (±0.28)	-	-
250	Common Rosefinch *Carpodacus erythrinus*	OA	[1]	-	-
251	Crested Bunting *Emberiza lathami*	OA	[1]	-	-
252	Black-headed Bunting *Emberiza melanocephala*	OA	11.7 (±6.04)	-	-
253	Red-headed Bunting *Emberiza bruniceps*	OA	10.43 (±8.26)	-	-
254	Grey-necked Bunting *Emberiza buchanani*	OA	4.63 (±3.81)	-	-

Appendix 2. List of birds recorded by others

No	Species	Individuals	Site and District	Reference
1.	Sanderling *Calidris alba*	50	Vishnupad Templae lake, Pandhrapur, SO	Badave (2020)
2.	Dusky Crag-Martin *Ptyonoprogne concolor*	1 15 8 1	Mohol, SO Great Indian Bustard Sanctuary, Nannaj, SO; Hipparga lake, SO Sambhaji lake, SO	Nalavade (2003); Shenai (2020a) Shenai (2020b) Taylor (2012)
3.	Baillon's Crake *Zapornia pusilla*	1 2	Yamai lake, SO Great Indian Bustard Sanctuary, Nannaj, SO	Badave (2018) Correia (2019)
4.	Rufous-fronted Prinia *Prinia buchanani*	4 1	Great Indian Bustard Sanctuary Nannaj, SO	Jacob (2016) Khopkar (2017)
5.	Western Crowned Warbler *Phylloscopus occipitalis*	1	Great Indian Bustard Sanctuary, Nannaj, SO	Rahane (2015)
6.	Taiga Flycatcher *Ficedula albicilla*	1 2	Smruti Udyan, Solapur city, SO Solapur city	MigrantWatch (2015) Abdulpurkar (2020)
7.	Common Chiffchaff *Phylloscopus collybita*	1	Great Indian Bustard Sanctuary, Nannaj, SO	Kher (2014)
8.	Chestnut-tailed Starling *Sturnia malabarica*	10 1	Great Indian Bustard Sanctuary, Nannaj, SO Solapur city	Staton (2013) Abdulpurkar (2018)
9.	Savanna Nightjar *Caprimulgus affinis*	X	Great Indian Bustard Sanctuary, Nannaj, SO	Viswanathan (2011)
10.	Booted Warbler *Iduna caligata*	1 1 1	TISS Campus, Tuljapur, OS Gangewadi, OS; Great Indian Bustard Sanctuary, Nannaj, SO; Hiraj, SO Vishnupad Temple, SO	Thakur (2015) Mohan (2019a) Sagare (2020b)
11.	Brown Shrike *Lanius cristatus*	1 1	Gangewadi, OS and Great Indian Bustard Sanctuary, Nannaj, SO Yamai lake, Pandharpur, SO	Mohan (2019c) Badave (2017b)
12.	Tawny Pipit *Anthus campestris*	1 1 1	Gangewadi, OS Yamai lake, Pandharpur, SO Great Indian Bustard Sanctuary, Nannaj, SO	Mohan (2019c) Badave (2017b) Gaekwad (2020b)
13.	Blyth's Pipit *Anthus godlewskii*	1	Gangewadi, OS	Mohan (2019)
14.	Hume's Warbler *Phylloscopus humei*	1	TISS Campus, Tuljapur, OS	Thakur (2015)
15.	Ashy Drongo *Dicrurus leucophaeus*	2 4 1	TISS Campus, Tuljapur, OS Great Indian Bustard Sanctuary, Nannaj, SO Hiraj, SO	Dutta (2019); Pawar (2020) Mohan (2019b)
16.	Greenish Warbler *Phylloscopus trochiloides*	2 1 1	TISS Campus, Tuljapur, OS Great Indian Bustard Sanctuary, Nannaj, SO; Hiraj, SO Sambhaji lake, SO	Thakur (2015); Mohan (2019a) Taylor (2012)
17.	Sykes's Warbler *Iduna rama*	1	Great Indian Bustard Sanctuary, Nannaj, SO	Prashanth (2019)
18.	Eurasian Curlew *Numenius arquata*	1	Hipparga, SO	Abdulpurkar (2013)
19.	White-bellied Drongo *Dicrurus caerulescens*	2	Great Indian Bustard Sanctuary, Nannaj, SO	Mandavkar (2018)
20.	Long-billed Pipit *Anthus similis*	1 1	Yamai lake, Pandharpur, SO Great Indian Bustard Sanctuary, Nannaj, SO	Badave (2017a) Zaveri (1991)
21.	Common Quail *Coturnix coturnix*	3	Kumbhargaon, Bhigwan, PU	Desai (2015)
22.	Alpine Swift *Apus melba*	1	Great Indian Bustard Sanctuary, Nannaj, SO	Praveen (2006)
23.	Asian Pied Starling *Gracupica contra*	1	Great Indian Bustard Sanctuary, Nannaj, SO	Mehta (2019)
24.	Green Sandpiper *Tringa ochropus*	1 1 1 1	Hipparga, SO Yamai lake, Pandharpur, SO Great Indian Bustard Sanctuary, Nannaj, SO; Hiraj, SO Sambhaji lake, SO	Gaekwad (2020a) Sagare (2020a) Mohan (2019a,b) Taylor (2012)
25.	Indian Scops-Owl *Otus bakkamoena*	1	Yamai lake, Pandharpur, SO	Badave (2017a)
26.	Singing Bushlark *Mirafra cantillans*	1	Great Indian Bustard Sanctuary, Nannaj, SO	Jacob (2016)
27.	European Bee-eater *Merops apiaster*	1	Great Indian Bustard Sanctuary, Nannaj, SO	Vaghela (2019)

Abbreviations: OS=Osmanabad; SO=Solapur.

Note: Checklists from the intensive study area of the Great Indian Bustard Sanctuary, Nannaj, Solapur, and ~50 km radius (Hipparga Lake; Hiraj; Yamai Lake, Pandharpur of District Solapur, and Tata Institute of Social Science, Tuljapur; Gangewadi; Katgao Lake of District Osmanabad) were referred. The Red Spurfowl Galloperdix spadicea 10 individuals reported at Hipparga Lake, Solapur, on 01 December 2019, by Vishwanath Vhatkar, are considered doubtful.

Tracing the untraced sites in *Threatened Birds of Asia*, mostly from north-eastern India

Anwaruddin Choudhury

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The two-volume work, *Threatened Birds of Asia* (BirdLife International 2001a,b), published two decades ago, was an outstanding, unique, and comprehensive status summary of threatened Asian birds. Since then a lot of information in those volumes has been updated, and is available in dispersed places, as a revised edition of the volumes was never published. However, many contemporary articles, papers, and regional books still cite this important work, which is available freely online.

I try and rectify an important issue that has not been addressed in the two decades since its publication, by presenting an updated gazetteer, which includes some places wrongly mentioned, incorrectly spelt, or that could not be located and were listed as 'untraced'. This is important as this work has become, over the years, one of the key reference materials for the continent, and hence, tracing out the untraced locations should be done as it relates to a set of highly threatened birds. The select species, with their traced out locations, or wrong locations, are listed below, with corrections and approximate coordinates. Unless otherwise stated, all locations are within Assam.

Greater Adjutant *Leptoptilos dubius*

Original site details	Revised/corrected site details	Coordinates (approx.)	Remarks
Sonapur, Nagaon District	In Kamrup (Metropolitan) District	26.11°N, 91.98°E	Saikia (1995)
Hojai (Nilbagan), Karbi Anglong District	In Hojai District (erstwhile undivided Nagaon District)	Hojai (26.00°N, 92.83°E), Nilbagan (26.06°N, 92.90°E)	Hojai and Nilbagan are different sites but was never part of Karbi Anglong District
Keotkuchi	In Barpeta District	26.53°N, 91.01°E	
Senga	Chenga, Barpeta District	26.27°N, 91.17°E	
Mongoldoi	Mangaldoi, Darrang District	26.45°N, 92.01°E	
Amulapatty, Noiapara, Japara, Kutuha, Phulbagan	In Dibrugarh District	27.47°N, 94.91°E	All these sites are in and around Dibrugarh town
Bhugdoi River	Bhogdoi River, Jorhat District	26.75°N, 94.20°E	Coordinates of probable site
Gormur	In Majuli District	26.95°N, 94.17°E	Formerly part of undivided Jorhat District
Janjimukh	In Jorhat District	26.92°N, 94.38°E	
Alikask	Alikash, Kamrup District	26.12°N, 91.28°E	
Dadara and Singimari	In Kamrup District	26.20°N, 91.63°E	
Adabari	In Kamrup District	26.30°N, 91.42°E	
Daulasala	Daulasal, Nalbari District	26.25°N, 91.22°E	
Ghograpara	Ghograpar, Nalbari District	26.45°N, 91.45°E	
Bota (Lowkhowa road), Chinapatty, Haibargoan (North Hoibargaon), Kharampatty, Daurabeel, Sialmari, Khutikatia	In Nagaon District	26.35°N, 91.68°E	These sites are in or adjacent to Nagaon town
Chapormukh	In Nagaon District	26.20°N, 91.50°E	
Dhuliapar, Kuwarpur, Mothadang–Nadipar, Mothadang, Ranghar Chariali, near Sat Sang Bihar, Bagharchuk	In Sivasagar or Sibsagar District	26.98°N, 91.60°E	All these sites are in or around Sivasagar or Sibsagar town
Na-Pukhuri	In Sivasagar or Sibsagar District	26.97°N, 91.75°E	
Dumnichoki	In Darrang District	26.35°N, 91.82°E	
Gohain *beel* and Singia	Dhakuakhana subdivision, Lakhimpur District	27.28°N, 94.40°E	Choudhury (2000). Nearby places
Koling *beel*	In Lakhimpur District	27.10°N, 94.20°E	
Between Balipara and Jamuguri	In Sonitpur District	26.83°N, 92.80°E	
Koliabor	In Nagaon District	26.52°N, 93.10°E	
Jagi Road	Jagiroad, Morigaon District	26.12°N, 92.20°E	Rahmani et al. (1990)
Manaha	In Morigaon District	26.27°N, 92.17°E	
Barpujia (Bhorbugia)	Barapujia, Nagaon District	26.25°N, 92.50°E	Changkakati & Das (1991)
Bamanigaon	Bamunigaon, Kamrup District	26.00°N, 92.28°E	

BirdLife International (2001a) erroneously quoted (Choudhury 1993), stating that two nesting trees existed in Islampur in 1990 and subsequent years, when, in fact, Choudhury (1993) had no mention of Islampur. I think it was a mix up of Islampur graveyard in Guwahati city and this article on Nagaon and Sivasagar. Islampur is not a nesting site, but a roost.

White-rumped Vulture *Gyps bengalensis*

Original site details	Revised/corrected site details	Coordinates (approx.)	Remarks
Bhurtpur	Bharatpur, Rajasthan	25.20ºN, 77.50ºE	
Jaldapar National Park, Assam	Jaldapara National Park, West Bengal	26.67ºN, 89.25ºE	
Krishnai and Paikan, Kamrup District	Krishnai and Paikan, Goalpara District	26.02ºN, 90.65ºE	Nearby places

Manipur Bush Quail *Perdicula manipurensis*

The map in BirdLife International (2001a: 827) shows a site south of the Brahmaputra, but this Mornai or Mornoi is actually on its north (see below, under Slender-billed Babbler).

Chestnut-breasted Partridge *Arborophila mandelli*

Assam. Bhutan Duars, collected in April (Hume 1874), this referred to specimens of *A. mandelli*. The Bhutan Duars is no longer in Bhutan, but partly in northern West Bengal (around one-third), and partly in western Assam (slightly more than two-third).

Blyth's Tragopan *Tragopan blythii*

Original site details	Revised/corrected site details	Coordinates (approx.)	Remarks
Samagooting, SimaGooding, Nagaland	Chumukedima, Dimapur District, Nagaland	25.75ºN, 93.80ºE	Godwin-Austen (1872a): The collection sites were apparently in the Barail range, as such heights, as mentioned, are only found in that range, which is at least 15–20 km away.
Noklak	Noklak, Tuensang District, Nagaland	26.20ºN, 95.00ºE	A mounted specimen, apparently of local origin, found in 1996 (Choudhury 1997)

Sarus Crane *Grus antigone*

The only records for Meghalaya are from: Shillong, East Khasi Hills District, June 1999 (Choudhury et al. 1999), and elsewhere in the district at Lady Hydari Park, June 1999 (Choudhury et al. 1999). These localities refer to the same site, and had only captive birds, and should not be considered. Lady Hydari Park is located within the heart of Shillong city (1,500 m asl) and houses the Shillong Zoo and Forest Museum, which held the birds in June 1999 when I visited.

Bengal Florican *Houbaropsis bengalensis*

Original site details	Revised/corrected site details	Coordinates (approx.)	Remarks
Mornai, Goalpara			See under Slender-billed Babbler
Demoo Nuddie	Between Tamulpur and Darrangamela in Baksa District	26.67–75ºN, 91.50–53ºE	In Pollok (1879) South of the eastern buffer of Manas Tiger Reserve
Hazoo	Hajo, Kamrup District	26.25ºN, 91.52ºE	In Pollok (1879) A pilgrim site for muslims, buddhists and hindus
Jargoan	Jargaon or Jhargaon, South-east of Tamulpur town, Baksa District	26.60ºN, 91.62ºE	In Pollok (1879)
Maji Koochie	Maji Kuchi, Udalguri District (formerly part of undivided Darrang District)	26.60–63ºN, 91.75–80ºE	In Pollok (1879) This is a region (locally called *mouza*) comprising several villages. It is *c.*20 km south of Bornadi Wildlife Sanctuary
Kharjan	30 km east/north-east of Dibrugarh town	27.53ºN, 95.12ºE	In Dibrugarh District (Stevens 1914, 1915a,b)
Mina Muttee	Mainamati in Bajali area, Barpeta District	26.55ºN, 91.12ºE	In Pollok (1879) *c.*3 km north-west of Pathsala town
Nokhroy	06 km north-west of Tinsukia town in Tinsukia District	27.55ºN, 95.30ºE	Till 1989, Tinsukia was part of Dibrugarh District. During Stevens's time (Stevens 1914, 1915a,b) it was part of undivided Lakhimpur District
Paka Marah	Pakhamara, near Borbori, Baksa District	26.63ºN, 91.35ºE	In Pollok (1879) *c.*3.5 km east of Musalpur. Till 2003, it was part of Nalbari District
Kumblepur	Tamulpur, Baksa District	26.33ºN, 91.58ºE	In Pollok (1879) Tamulpur is north of Rangiya

Marsh Babbler *Pellorneum palustre*

BirdLife International (2001b: 2086), quoting Hume (1888), mentions a place called 'Dibung', April–May 1877, Sadiya (Sadia), Assam, but in parentheses states, 'possibly Dibang River, and therefore possibly in Arunachal Pradesh'. The Dibang River is not entirely in Arunachal Pradesh. Before its confluence with Lohit River, it passes through the Sadiya subdivision of Assam for at least 16 km (*c.*27.83–97°N, 95.58–60°E).

BirdLife International (2001b) confirms Bangladesh records from 'wetlands at Bholaganj (Bolagunj), Sylhet, at the base of the Khasia Hills, *c.*1869–1870 (Godwin-Austen 1872b, specimens in the British Museum of Natural History [now Natural History Museum]; Hume 1888)'. This site is right on the Meghalaya–Bangladesh border (*c.*25.17°N, 91.75E) and the grassland/marshy areas exist on both sides, and the birds could be from either side. Even inside Khasi Hills, the area is a flat plain and there was no clear-cut boundary demarcation as it is now fenced. I visited Bholaganj, in Meghalaya, in 2013 to see the current situation. A few stands of elephant grass stood near small pools, but owing to paddy cultivation, there was no chance of extension of grassland. On the Bangladesh side, visible from near the fence, the condition was similar.

Tawny-breasted Wren Babbler *Spelaeornis longicaudatus*

Original site details	Revised/corrected site details	Coordinates (approx.)	Remarks
Mahadeo	Mahadeo Peak or Mahadev Tilla, east of Haflong, North Cachar Hills (Dima Hasao) District, Assam	25.13ºN, 93.17ºE	Specimens in the American Museum of Natural History (AMNH #573699) and in the Natural History Museum, London

Rasmussen & Anderton (2012) did not include North Cachar in its range, stating these specimens to be untraced. This location clarification resolves this issue and extends its range to the North Cachar Hills, assuming both the specimens were correctly identified. The AMNH specimen is still incorrectly listed from the West Khasi Hills, which may be corrected.

Black-breasted Parrotbill *Paradoxornis flavirostris*

For Bholaganj (=Bolagunj), Sylhet, see observations under Marsh Babbler, and for Mornai Tea Estate, see observations under Slender-billed Babbler.

Slender-billed Babbler *Argya longirostris*

The site 'near Mornai tea estate', Goalpara District, has been shown south of the Brahmaputra River on the map in BirdLife International (2001b: 2121). There are two tea estates with the same name: one is located near Goalpara town, south of the Brahmaputra, and the other in the *duars,* north of the river. None of the antedated articles and reports mentions the location in relation to the river, or in *duars*, or away from the *duars*. In the description of the Manipur Bush Quail *Perdicula manipurensis inglisi*, the collector had stayed with A. M. Primrose at Mornai, or Mornoi (Ogilvi-Grant & Inglis 1909). Primrose's place of stay at that time as per his own articles (Primrose 1905a,b) was Mornai or Mornoi Tea Estate (*c.*26.33ºN, 89.88ºE), with Tamarhat as the Post Office. Hence, this tea estate, which was source of many crucial specimen records must have been located north of the Brahmaputra and is now in present day Kokrajhar District.

Bristled Grassbird *Schoenicola striatus*

"A specimen was possibly taken at the Garo Hills, Meghalaya, 1869–1870 (Godwin-Austen 1870). However, as Godwin-Austen included many species shot nearby in Sylhet or Mymensingh (at the base of the Garo or Khasia Hills, an area perhaps more likely to hold populations of this species), this record is probably from Bangladesh rather than Meghalaya" (BirdLife International 2001b).

It is very much possible that it was actually taken from the Garo Hills as there were large plain areas with tall grass in the wide valleys across Garo Hills where even the wild water buffalo *Bubalus arnee* (Choudhury 2010) and the great Indian one-horned rhinoceros *Rhinoceros unicornis* (Pollok 1879) used to occur.

Beautiful Nuthatch *Sitta formosa*

Original site details	Revised/corrected site details	Coordinates (approx.)	Remarks
Asalu, Khasia Hills (in Meghalaya)	Asalu, North Cachar Hills (Dima Hasao) District, Assam	25.18ºN, 93.22ºE	On the slopes of Barail range

Finn's Weaver *Ploceus megarhynchos*

Original site details	Revised/corrected site details	Coordinates (approx.)	Remarks
Ronikata Camp, Goalpara	Runikhata, north of the Brahmaputra River, Chirang District	26.63ºN, 90.40ºE	The map shows a site south of the Brahmaputra River because of the location of Goalpara town. Chirang was part of undivided Goalpara District

Discussion and Conclusions

Many of the untraced north-eastern Indian sites mentioned in BirdLife International (2001a,b) are listed and rectified in this note, in an effort to standardise our common knowledge base. BirdLife International (2001a,b) covered species that were threatened with extinction owing to various reasons, and was compiled so that effective conservation measures could be taken. Correct locations are extremely important in such matters.

In a recent review, Hortal et al. (2015) stated that despite recent efforts to gather two centuries of biodiversity inventories into comprehensive databases, many crucial research questions remain unanswered. They presented seven key shortfalls of current biodiversity data, which included knowledge gaps for species distribution as one of them. They further said that shortfalls on species and distribution data have the farthest-reaching influence because data on the identity and distribution of species are vital for identifying broad-scale patterns in biodiversity and the processes that modify biodiversity (e.g., extinction). The distribution data shortfall (they call it 'Wallacean shortfall') can also have profound impacts on estimates of conservation threat status. Range size is frequently used in conservation planning, including IUCN red-listing, in which species with small ranges are given higher extinction risk status and conservation priority.

It is therefore recommended that future authors should use this work in conjunction with *Threatened Birds of Asia* to correctly plot these locations. Also, the locations mentioned in the catalogues of the natural history museums should also be updated to reflect the changes proposed in this work.

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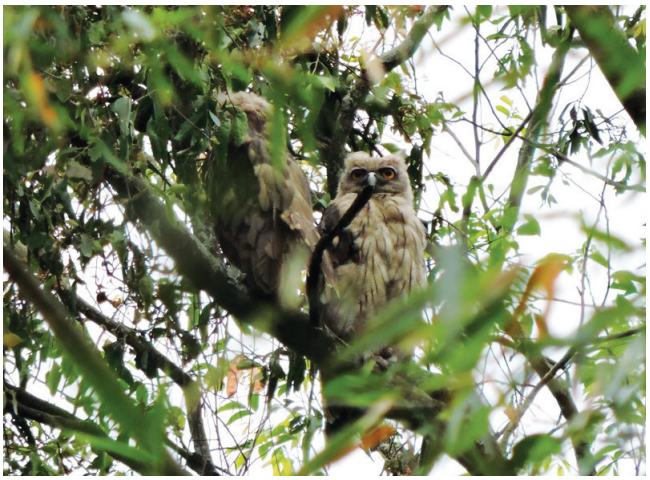
Recent breeding records of the Dusky Eagle Owl *Bubo coromandus* from upper Assam

The Dusky Eagle Owl *Bubo coromandus* is a resident breeding bird in the northern parts of the Indian Subcontinent and South-east Asia (Konig et al. 1999). Its distribution range is well documented from Pakistan, along most of the sub-Himalayan region in India up to the western and lower regions of Assam, Manipur, Meghalaya in north-eastern India, and Bangladesh (Ali & Ripley 1983; Rasmussen & Anderton 2012). The breeding of this owl has never been studied in Assam or north-eastern India. The earlier evidences of its breeding in Assam were from Pobitora Wildlife Sanctuary, Morigaon District, in central Assam (Choudhury 2000); where one of us (SR) also recorded three juveniles on 26 April 2004. However, since 2013, during our study and surveys on vultures, we were able to record eight nests of this large species of owl from Upper Assam—a region that starts from Golaghat District and extends east/northeast till Tinsukia.

Table 1 lists the nesting records we documented from Upper Assam. In all cases the adults were seen with nests, which were large saucer like platform. All the nests were placed on tall trees, the tallest in the neighbourhood, but specifically, close to waterbodies. Seven of the eight nests were on simul *Bombax ceiba*, while one was on a *Ficus* sp. Tree heights ranged from 15–21 m (median 19 m), and nest height 11–20 m (median 15m).

From 2018 to 2020, four nests at Demow, Sivasagar, were observed more than once: January–March 2018 (n=5), November 2019 (n=2), and January–March 2020 (nest1 [n=2] and nest 2 [n=5]). The remaining nests were only observed once (n=5). All these opportunistic observations (n=19) were recorded from November to April. In these nine nesting attempts, only one failure was recorded. At Demow, during 2018–2020, the adults were seen roosting near the nesting location in the non-breeding season (n=12).

Though these observations were made prior to the publication of the extensive guidelines for nesting biology studies (Barve et al. 2020a, b), our studies do not violate any of the guidelines. Five of the eight nests were opportunistic observations and were visited only once each. Three nests were visited fortnightly for documenting the nesting success. The nests were documented from a distance, from regular road or safari jeep tracks, in the case of Kaziranga National Park. All visits to protected areas were with due permits and tickets. We did not disturb any of the breeding birds while documenting them. We did not climb the nesting trees for any purpose, and estimates of nest/tree heights were arrived at from the ground. None of the nests, or nesting trees, were marked and all observations were carried out during late morning or afternoon.



63. Dusky Eagle-owl fledglings at Demow, Sivasagar, 2014.

64. Dusky Eagle-owl adult at Kaziranga National Park, 2018.

Both: Sachin Ranade

Table 1. Nest locations of Dusky Eagle Owl in Assam

Date	Breeding stage	Nest tree	Tree height (in m)	Nest height (in m)	Location	District	Observer
13 February 2013	Active nest	*Bombax ceiba*	20	15	Demow	Sivasagar	SR
27 April 2014	3 fledglings	*Bombax ceiba*	18	15	Demow	Sivasagar	SR **[63]**
28 February 2018	2 fledglings	*Ficus* sp	21	20	Central Range, Kaziranga NP	Golaghat	SR **[64]**
27 February 2018*	2 fledglings	*Bombax ceiba*	17	15	Demow	Sivasagar	SR, RG
14 November 2019	Active nest	*Bombax ceiba*	21	18	Eastern Range, Kaziranga NP	Golaghat	SR, **[65]**
01 November 2019*	Active nest	*Bombax ceiba*	21	20	Demow	Sivasagar	SR, RG **[66]**
10 January 2020*	Nest abandoned	*Bombax ceiba*	15	11	Demow	Sivasagar	SR, RG
20 February 2020*	2 fledglings	*Bombax ceiba*	17	15	Demow	Sivasagar	SR, RG

*Visited more than once in the breeding season

Sachin Ranade

65. Dusky Eagle-owl adult at Kaziranga National Park, 2019.

Rounaq Ghosh

66. Dusky Eagle-owl, adult and nestling at Demow, 2019.

Stevens (1915) did not mention this species, though he mentioned several other species of large owls, like the Brown Fish Owl *Ketupa zeylonensis*, Buffy Fish Owl *K. ketupu*, Tawny Fish Owl *K. flavipes*, and Spot-bellied Eagle Owl *Bubo nipalensis*. Barua & Sharma (1999) recorded the presence of the Dusky Eagle Owl in Kaziranga National Park as an 'occasional', and were unsure about its status as resident species. There were 89 sightings of this species from Assam that were uploaded to eBird by May 2020, and Choudhury (2000) mentioned it as a rare resident. Ali & Ripley (1983) mentioned its preferred nesting trees, such as, *Ficus religiosa, Stephegyne* (now *Mitragyna*) *parvifolia*, and *Dalbergia sisoo* in northern India; while Baker (1934) mentioned *Tamarindus indica* as an example of a nesting tree. Prakash (1988) recorded thirteen nests during 1985–1986 and 1987–1988 in Keoladeo National Park, Bharatpur, Rajasthan. The tree species used there were *Mitragyna parvifolia*, *Acacia nilotica*, and *Syzygium cumini*, and the average nest height was 12 m. During our observations the preferred tree was simul, probably one of the commoner tall tree in the north-eastern India.

The species is known to occupy old nests of kite, vulture, and eagle (Ali & Ripley 1983). In Kaziranga, on both instances, the owl occupied nests of the Grey-headed Fish Eagle *Haliaeetus ichthyaetus*, and at Demow, twice, it used the nest of the Slender-billed Vulture *Gyps tenuirostris*.

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A partially leucistic Indian Peafowl *Pavo cristatus* from Tamil Nadu, India

On 07 March 2017, at Botanical Survey of India's (henceforth, BSI) staff quarters, Pappanaicken Pudur, Coimbatore (11.02°N, 76.92°E; 440 m asl), Tamil Nadu, we noticed a peahen with a peculiar colour pattern. It had white patches on head, neck, wings, and tail. These were not commonly seen among the other individuals of Indian Peafowl *Pavo cristatus* **[67A]**. We observed the peahen for a couple of months, and on 21 ↑April ↑2017 we realised that it had more white in its plumage **[67B]**. On 27 August 2017, we spotted it with a normally coloured male peafowl, that was display dancing **[68A,B]**. Based on the plumage characteristics, this appears to be a case of partial leucism with normal coloured bill and feet.

Colour aberrant wild peafowls appear to be rare. No instance was reported in a comprehensive review of colour aberrant birds from country by van Grouw et al. (2016). The only instance we know of is a colour aberrant male Peafowl from the Thar Desert, Rajasthan, India, reported by Parihar (2015) as a case of albinism. However, mutant peafowl have been well-known in aviculture and hence the origin of the present bird needs an evaluation. The

67A. Leucistic peahen with normal coloured peahen on 7th March 2017;
67B. Leucistic peahen on 21th April 2017.

68A,B. Leucistic peahen with normal coloured peacock on 27th August 2017.

Both: Ravi Kiran Arigela

BSI staff quarters are adjacent to the Boluvampatti Reserve Forest of the Nilgiri Biosphere Reserve, Coimbatore. Since 2013, we have observed a free-roaming wild population of Indian Peafowl that also roost in the coconut trees *Cocos nucifera* on the campus. We are not aware of any aviculture activities within the neighbourhood and certainly not inside the premises of BSI staff quarters, which belongs to the Ministry of Environment, Forest & Climate Change, Government of India. On the basis of this, it is likely that our bird was in fact a wild mutant.

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An aberrant White-rumped Shama *Copsychus malabaricus* with a white throat

On 14 March 2020, we visited Mamanduru Reserve Forest, Chittoor District, Andhra Pradesh, for bird watching. The reserve forest consists of moist vegetation with interspersed patches of bamboo thickets, which are fed by seasonal streams that flow through this forest. Sightings of White-rumped Shama *Copsychus malabaricus* in these bamboo thickets are very common. On our way back from the Mamanduru Stream, VKL and NG heard a song at 1013 h (13.76°N, 79.47°E) from a nearby bamboo thicket and identified it as that of a White-rumped Shama. Upon searching for it, they came across an individual with unusual, prominent white throat **[69]**. The observed individual did not show any usual signs of albinism such as total lack of both melanins in feathers, eyes, and skin; or leucism such as partial or total lack of eumelanin or phaeomelanin in the feathers (Grouw 2006).

Naman Goyal

69. Photograph of the White-rumped Shama showing the noted aberration.

Although the White-rumped Shama is sexually dimorphic, this particular individual had brownish wings and black body which created confusion in determining its sex. Nonetheless, it had a prominent white rump and rufous vent, which is typical for the species, along with the long tail, clinching the bird's specific identity. We are not aware of any instance of colour aberration in this species from India (Mahabal et al. 2016). We reviewed the literature post that paper, as well as online citizen science platforms (eBird 2020; Oriental Bird Images 2020) from India, and found no record of the observed plumage.

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Leucism in Brahminy Starling *Sturnia pagodarum*

On 15 April 2020, while I was sitting at a window of my home in Shevgaon (19.35°N, 75.22°E), Ahmednagar District, Maharashtra, at 0930 h, I saw this unusual bird that I photographed **[70]**. The plumage defied me and I could not immediately identify it though, from the behavior and calls, it resembled other Brahminy Starlings *Sturnia pagodarum* that accompanied it. The bird has been a regular visitor since then till 05 June 2020. When I shared these pictures with other birding friends, they suggested an albino Brahminy Starling. However, further research led me to the conclusion that this was, more likely, leucism, as the eyes of the bird are normal in colour (van Grouw 2013). This is probably the first instance of leucism reported in this species from India (Mahabal et al. 2016).

Mahesh Phalke

70. Leucistic Brahminy Starling.

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Sighting of the White-capped Bunting *Emberiza stewarti* in West Bengal, India

On the afternoon of Sunday, 24 November 2018 we were birding at Brindabanpur (22.30°N, 86.97°E), Jhargram District, West Bengal. The area had rocky slopes interspersed with grass. We watched Rosy Starlings *Pastor roseus*, Brahminy Starlings *Sturnia pagodarum*, Jungle Babblers *Turdoides striata*, Black Drongos *Dicrurus macrocercus*, and Blue-throated Barbets *Megalaima asiatica*. Suddenly we noticed a small bird in a tree that looked a little different. From a distance it looked like a warbler, but when BM, who first photographed it **[71]**, realized that it was a bunting; subsequently others also photographed it. It had a grey head, black eye-stripe and throat, chestnut breast-band, and chestnut rump, and it uttered a sharp '*tzi-tzi-tzi-tzi*' while perched. All these features helped AD identify it as a male White-capped Bunting *Emberiza stewarti*.

Biswarup Mandal

71. White-capped Bunting in Jhargram District, West Bengal.

When AD discussed this sighting with Kanad Baidya, we realized that it is a rarity in West Bengal. We revisited that place in next few days, regularly, and the bird was still there and was last spotted by BM on 06 January 2019.

The White-capped Bunting breeds from the mountains of Central Asia up to Kashmir and Himachal Pradesh, while it winters mostly in north-western India, apart from Pakistan and southern Afghanistan. The known eastern limits of the bird in India are from Madhya Pradesh, north-eastern Maharashtra, and central Uttar Pradesh; and Nepal (Grimmett et al. 2011; Rasmussen & Anderton 2012; eBird 2020; Madge 2020). We are not aware of any records from West Bengal or eastern India: Bihar, Jharkhand, Chattisgarh, or Odisha, nor from further east in north-eastern India or Bangladesh.

We thank Sayan Dasmahapatra and Kanad Baidya for helping us to write this short note.

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Records of Merlin *Falco columbarius* in Himachal Pradesh

The Merlin *Falco columbarius* is a small, dashing, sexually dimorphic falcon, with short pointed wings. It has Holarctic, northern Neotropical and marginally Indomalayan distribution (Ferguson-Lees & Christie 2001; Warkentin et al. 2020). This short note describes Merlin records from Himachal Pradesh.

1. On 25 February 2009, at 0845 h, during his first visit to Nagrota Surian, Pong Lake, Himachal Pradesh (32.03°N, 76.06°E; *c.*420 m asl), CA saw an unfamiliar falcon that was much smaller than a Peregrine Falcon *F. peregrinus* **[72]**. It was perched on a stone, in the vast flats around the lake. At the slightest disturbance it took a short flight to settle on a nearby, similar, low perch. It had blue-grey upperparts and whitish underparts that were heavily streaked. Its moustachial stripe was weak, which differentiated it from an Eurasian Hobby *F. subbuteo*. The limited amount of rufous on head and different underpart markings, differentiated it from a Red-necked Falcon *F. chicquera*. It was identified as a male Merlin. It was, overall, a dark individual, with darkish blue-grey upperparts.

72. Merlin at Nagrota Surian, Pong Lake on 25 February 2009.

2. On 06 November 2011, at 0830 h, CA saw a falcon in recently ploughed fields, around the lake, at Nagrota Surian **[73, 74, 75]**. It had a greyish-blue crown with some rufous. The posterior part of weak supercilium, nape, ear coverts, weak moustachial stripe, and sides of throat were rufous-brown with fine, dark streaking. The upperparts were greyish-blue while the underparts, excluding the throat, were pale rufous with prominent dark rufous-brown streaking. The throat was whitish with fine streaking. It was initially identified as an adult male Merlin. Later, Prasad Ganpule pointed out that it was, in fact, a blue-tinged female because of the multiple broad bands in tail, face pattern, and the marking on underparts (*in litt.*, e-mail dated 14 May 2020).

73.

All: C. Abhinav

73, 74. Merlin at Nagrota Surian, Pong Lake on 06 November 2011.


C. Abhinav

75. Habitat shot of Merlin Nagrota Surian, Pong Lake on 06 November 2011.

3. Suryawanshi (2014) observed and photographed a male Merlin, from a distance, at Thinam, Spiti, Lahaul & Spiti District (32.31°N, 78.06°E; *c.*4,640 m asl) on 07 October 2014.
4. AV observed a small falcon at Dumla, Spiti, Lahaul & Spiti District (32.21°N, 77.59°E; *c.*4,100 m asl) on 13 September 2016 at 1610 h. It was sighted from a vantage point overlooking a gully. The brown upperparts and boldly streaked underparts could be easily noted since the bird was flying at almost eye-level. The face was rather plain and no striking features were noted. It was identified as female Merlin.

Ganpule & Bhatt (2013) reported *pallidus* as the commonest race in the Little Rann of Kachchh, Gujarat; but at Pong Lake, the observed individuals didn't look like this race, as they were darker, with strongly marked underparts (in both male and female). The female seen by CA **[73,74]** is particularly interesting as the blue-grey upperparts, the strongly patterned underparts, and the tail barring is suggestive of *aesalon* or of *aesalon*-type; the racial identification of other individuals seen here was not attempted by us as a detailed paper on the racial identification of Merlins in India is under preparation (Prasad Ganpule, in litt., e-mail dated 28 May 2020).

The Merlin is a rare winter visitor to northern and north-western India (Grimmett et al. 1998; Naoroji 2006; Ganpule & Bhatt 2013). Ali & Ripley (1987), Kazmierczak (2000), and Grimmett et al. (2011) have not mentioned/shown any record of the species from Himachal Pradesh. Naoroji (2006) did not mention any record from Himachal Pradesh, but suspected its presence in the state. den Besten (2004) did not observe the species during his extensive avian surveys between 1997 and 2003, in Kangra District, which included Pong Lake. Dhadwal & Kanwar (2018) mentioned it as a rare autumn passage migrant in Himachal Pradesh.

The neighbouring states of Punjab, and Haryana, and the Union Territories of Jammu, and Kashmir are in its regular wintering range, and in Ladakh, it is a rare passage migrant (Pfister 2004; Naoroji 2006). Mohan & Sondhi (2017) did not mention the species from Uttarakhand, but, there is one sight record from Kanchala, Amrutganga Valley, Kedarnath, Rudraprayag District at 2,600 m asl (Dixit et al. 2016; Viral Joshi, *pers comm*., dated 26 May 2020).

The record of Merlin from Pong Lake, on 25 February 2009, is probably the first properly documented record of this species from Himachal Pradesh. All other records of Merlin in Himachal Pradesh have been noted during its migration, except for the first sighting, which was in February, and could be treated as a late winter sighting. These few records suggest that the Merlin is a rare passage migrant in the state.

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First record of the Chinese Rubythroat *Calliope tschebaiewi* in Uttarakhand, India

The New Forest campus of the Forest Research Institute (FRI) is located in the Dehradun Valley in Uttarakhand. It is rich in avian diversity, including both, migratory as well as resident birds. Its avian checklist stands at a phenomenal 252 species within its small area of 4.5 sq. km (Kumar 2018). New Forest is surrounded by extensive human inhabitation, except for a weak linkage to degraded forests on its northern side, at the base of the Mussoorie Range of the outer Himalaya. A tributary of Yamuna River runs through its north-western boundary.

On 17 February 2020, HC was birding in New Forest, near the rivulet, in an area dominated by dense thickets of *Lantana camara* (30.354°N, 77.988°E; *c.*610 m asl). At 0857 h, HC heard a bird singing. On approaching the singing bird, he spotted a Rubythroat perched on the branch of *Lantana camara* **[76]**. It had a striking red throat, bordered by a black breast band. It had prominent white supercilium and moustachial stripe. The

upperparts were brownish grey. Photographs were taken and later send to CA. The Siberian Rubythroat *Calliope calliope* was ruled out as the bird in the photographs had a black breast band and was considerably darker. The prominent white moustachial stripe ruled out the closely related Himalayan Rubythroat *C. pectoralis*. CA identified it as a male Chinese Rubythroat *C. tschebaiewi*, one of the three Rubythroat species found in the Indian Subcontinent.

Himanshu C.

76. Chinese Rubythroat in Uttarakhand, India.

The Chinese Rubythroat was earlier included under the White-tailed Rubythroat, along with three other subspecies: *C. p. pectoralis*, *C. p. bailloni*, and *C. p. confusa* (Ali & Ripley 1987; Grimmett et al. 1998; Rasmussen & Anderton 2012). Now it is considered a separate species (Liu et al. 2016; Clements et al. 2019; del Hoyo et al. 2020). Breeding range of Chinese Rubythroat extends from extreme eastern Kashmir, through southern Tibetan Plateau to northern Bhutan, northern Arunachal Pradesh, eastern and north-eastern Tibetan Plateau, central China and extreme northern Myanmar (Rasmussen & Anderton 2012; del Hoyo et al. 2020). Recently it was reported from Spiti during summer season, in the neighboring state of Himachal Pradesh (Abhinav & Kuriakose 2019). It breeds between 2,600 and 4,800 m asl, mostly above 4,000 m asl, and winters in the foothills of eastern Nepal, north-eastern India, north-eastern Bangladesh, northern Myanmar, and southern Yunnan (Ali & Ripley 1987; del Hoyo et al. 2020). It is rare in Nepal, but common in the Assam Valley and the South Assam Hills (Rasmussen & Anderton 2012).

New Forest and the Dehradun Valley are well-heeled birdwatching regions (Wright 1957; George 1962; Guha 1967; Mohan 1993, 1997; Singh 2000). There have been no records of the Chinese Rubythroat from Uttarakhand (Ali & Ripley 1987, Mohan & Sondhi 2017; eBird 2020) and the present record is the first for the state. This record is surprising as the species' wintering range starts from eastern Nepal (Ali & Ripley 1987; del Hoyo et al. 2020), which is *c.*800 km eastwards of this record, and 17 February is too early for spring migration. This single record should be considered as a vagrant record; however birders should remain vigilant for its presence in the foothills of Western Himalayas during winter season.

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On the occurrence of the Green Sandpiper *Tringa ochropus* in Mizoram, India

The Green Sandpiper *Tringa ochropus* is a winter visitor to India (Ali & Ripley 1987). In north-eastern India it is common in Assam (Choudhury 2000). It affects waterbodies including *beels*, marshes, and riverbanks. In Mizoram, it has not been reported (Choudhury 2005, 2006, 2016). Choudhury (2008) has not included it in the main bird list, but mentioned that it is likely to occur. Lalthanzara & Kasambe (2015) also did not mention anything about the species.

On 21 November 2016, I started a boat journey (country boat fitted with a small motor) along the Assam–Mizoram border, following the Pakwa or Teirei River, a tributary of the Dhaleswari. In its upper reaches this river marks the eastern boundary of the Dampa Tiger Reserve. The objective was to inspect a Border Police Out Post located at Gutguti, in Inner Line Reserved Forest, Assam. At 1035 h, a sandpiper was seen flying on and off (disturbed a bit by the boat), sometimes landing on the sand banks on the right, and sometimes on the left of the river. The right bank was in Mizoram's Mamit District, and the left, in

Assam's Hailakandi District. There were also Common Sandpipers *Actitis hypoleucos* and Little Ringed Plovers *Charadrius dubius* en route, and high up in the sky were several migrating Amur Falcons *Falco amurensis*. I did not make any attempt to identify the waders from the fast-moving boat, but took photographs. A few years later, while checking some photos, I came across this one, a very conspicuous Green Sandpiper, hitherto unreported from Mizoram **[77]**. The less distinct spots on its upperparts, shorter greenish legs, tail not projecting beyond closed wings, and somewhat larger size, eliminated both, the Wood Sandpiper *T. glareola*, and the Common Sandpiper.

Anwaruddin Choudhury

77. Green Sandpiper in Mizoram, India.

The species has been recorded across the border in Assam, Manipur, Tripura, Bangladesh, and Myanmar, but not near the border as the nearby areas of these countries and states are hilly and mountainous. The bird might be a regular, but scarce, passage migrant along the streams and rivers, which are not accessible to many birdwatchers in Mizoram.

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Black-capped Kingfisher *Halycyon pileata* from Dibang Valley, Arunachal Pradesh, and its status in north-eastern India

The Black-capped Kingfisher *Halycyon pileata* is known to predominantly inhabit coastal habitats. Vagrants have been found inland upto *c.*1,600 m from the coast, landing there, presumably, due to unfavourable rainfall patterns—amongst other factors (Rasmussen & Anderton 2012; Woodall & Kirwan 2020).

We encountered single birds on two separate days **[78]** whilst carrying out our routine bird survey (Mohanty 2018a,b; WII 2019). On both occasions, the bird was readily identified by its black cap (or head) and shoulders, purple-blue wings, and its other identifiable features that include a rufous underbelly, white collar and neck (Grimmett et al. 2011).

L: Sumit Arya; R: Arundhati Mohanty

78. Black-capped Kingfisher from Dibang Valley, Arunachal Pradesh.

Our first sighting on the 13 May 2018, was at 0730h. The bird was perched in the lower canopy of a tree in Dus Kilo village (28.63ºN, 95.94ºE; 894 m asl) and was actively feeding at the time. The second sighting was at 1100h on the 15 May 2018 wherein the kingfisher was perched on a powerline near Atunli Village (28.66ºN, 96.03ºE; 1,127 m asl).

The aerial distance between the two locations is nine kilometers, and both are in close proximity to the Tangon River. Peak summer, when the birds were seen, is also their breeding season in India (Fry & Fry 2010).

The inland occurrence of this bird is sparsely recorded throughout the Indian Subcontinent with a majority of the records being from the central Indian states. We reviewed all its historical, and contemporary records from north-eastern India, primarily using the eBird range map, and subsequently delving into published records (Fig. 1). We found that it has been recorded as an occasional visitor/vagrant to the north-eastern states known as the seven-sisters (Table 1).

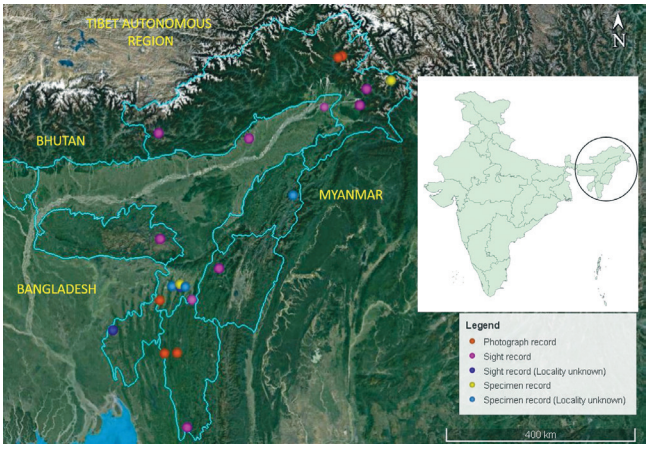

Fig. 1. Past and present records of the Black-capped Kingfisher from north-eastern India. [The boundaries depicted in the map are only for illustration, and may not be accurate.]

Table 1. Records of Black-capped Kingfisher from north-eastern India, listed state-wise and chronologically

State	District	Locality	Month	Year	Type	Reference/Notes
Arunachal Pradesh*	West Kameng	Foothills Range headquarters	April	1991	O	Singh (1995)
	Anjaw	Hotspring	September	1991	S	Purportedly killed locally at 3,300m (Singh 1995),which is probably an altitude record for India, though it has been reported at the same elevation in Bhutan (Spierenburg 2005)
	Lohit	Wakro	May	2002	O	Dutta (2002)
	Lohit	Khupa	May	2013	O	Restlessly flying from perch to perch as if guarding a territory (Sharma et al. 2014)
	Dibang Valley	Dus Kilo	May	2018	P	This work
	Dibang Valley	Atunli	May	2018	P	This work
Assam	Tinsukia	Sadiya	–	Pre-1977	O	Godwin-Austen (1877)
	Cachar	Hylakandy (Barak Valley)	–	Pre-1892	S	In 1897, C.M. Inglis wrote about a specimen he got 'five years ago' (Inglis1898a)
	Cachar	Chutla Beel, Kattal	October	1897	S	Collected by A.M. Primrose and presumably referenced in Inglis (1898b), and Baker (1901); the specimen is now housed in the Sofia Museum (Boev 1997)
	Cachar	Chutla Beel, Kattal	–	Pre-1901	O	A.M. Primrose apparently saw one in addition to the one he collected (Baker 1901)
	North Lakhimpur	In a small stream (=*jan*) of Dejoo River	April	1904	O	One sighting on 07 April,when the bird was not wary, and was probably not breeding (Stevens 1904)
	Cachar	Inner line RF	April	1988	O	Choudhury (2000). Anwaruddin Choudhury, *pers. comm*., March 2020
	Karimganj	Makunda Christian Hospital	September	2013	P	Ismavel (2013)
Manipur	Tamenglong	Zeiland Lake	January	2001	O	Choudhury (2009)
Meghalaya	Jaintia Hills	Norpuh Block 1	April	1997	O	Choudhury (2000)
Mizoram	Siaha	Phura Village	April	2001	O	Birand & Pawar (2004)
	Mamit	Dampa Tiger Reserve	January	2013	P	Don (2013)
	Aizwal	Tlawng Road	April	2019	P	Sawant (2019)
Nagaland	Eastern Naga Hills, north of Manipur	–	–	Pre-1878	S	Godwin-Austen (1878), and location basis statement in Hume (1888)
Tripura	West Tripura	–	–	1991	O	Year deduced from the year of sampling (Majumdar et al. 2002)

Abbreviations: O=Observation; P=Photograph; S=Specimen.
*A checklist compiled from Mishmi Hills and adjoining areas, includes this species, but the actual record is untraceable:
Website URL:https://www.kolkatabirds.com/trip_reports/mishmitriplist.html

Records of this bird from north-eastern India suggest its presence there, predominantly between April and May (n=10),whilst being tagged as a rare/occasional visitor. Other records are from January (n=2), and September–October (n=3); five records are missing the month information. Its presence here, being recorded mostly during spring and autumn, points to the possibility of passage migration given that its distribution range is not limited to India, and extends to adjoining Bangladesh, Myanmar, and China (Woodall & Kirwan 2020). Whether any of these birds breed in north-eastern India, as alluded by Sharma et al. (2014), is presently only a matter of conjecture.

All sightings have been in close proximity to sources of water, be it rivers or streams, which strengthen the inference that the bird chooses to be close to its foraging substrates.

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Postcard from Mumbai—My garbage dump

It's one in the afternoon and bird life has slowed at my garbage dump in Chembur, Mumbai.

The dump, an elevated concrete structure with metal grating doors on the upper side, was built for everlasting life, as our wet waste disposal unit where wonderful life giving compost is born. It's a paradise for breeding insects: larvae, grubs of different shapes and sizes that crawl around while adults flit, fly, or jump; a lavish spread for insectivores and omnivores. Squeezed between a mango on one side and a large kamini on the other, amidst a plethora of potted plants, providing hiding space for man and others alike.

We are into the 56th day of the nationwide lockdown, hiding fearfully behind masks and doors, trying to escape from the dreaded Corona virus. Braving it out only for bare essentials. After dealing with all housework, we search the screens, our senses straining for news of a remedy, but alas!

During this period I decided to visit our garbage dump regularly. Am I scavenging too? Yes, maybe for some insight into our backyard's natural world where life goes on without much ado.

Armed with a camera I now spend many hours hiding behind plants to catch the latest, observing the relations between the denizens of this micro-habitat. Gradually the complex relationship between all the visitors, including myself, started to unravel and become apparent.

The metal grating allowed most birds through, but not crows. Yet crows hung around trying their luck, a fruit peel or other tasty bits and pieces could have been carelessly left outside. Inveterate omnivores, they try everything, including harassing others who have salvaged a beak-full of food, like the mynahs or bulbuls. Two species of crow lurk here. Large-billed Crows, glistening in handsome black, are usually solitary, or in twos. They hold their ground even against a murder of four to five House Crows, who respectfully keep their distance. But House Crows will try to unnerve their larger opponent who are comparatively slower and ponderous in their approach. I found my presence kept the crows of all hues at a distance. This threw open the gates for the others.

Mynahs and the Red-vented Bulbuls pottered around fearlessly, diving into the depths of the dump. For the mynahs, getting in and out was difficult due to their size. On one occasion I saw a mynah struggling to escape from the inside, as I approached with stuff to add to the rotting heap. Mynahs were careful in my presence, but bulbuls were nonchalant. Their interest in this space has been, at best, occasional. The absence of crows and the presence of mynahs and bulbuls seemed a cue for the Magpie-Robin to swoop in, chasing all away.

The Magpie-Robin seems a paradoxical mixture of aggression and shyness, firmly chasing away all other birds, but scooting at the mere glimpse of me or the camera. With the progress of time, I am allowed a little more access, but only a wee bit more. The magpie-robins have also been in song, as males chase each other, or occupy vantage points, singing lovely courtship serenades. On occasions they have been seen collecting sticks or carrying food, hopefully for a waiting brood.

Under my gaze the doors open for Tickell's Flycatcher. In the early days, until the tenth of April, it scrapped with a female Paradise Flycatcher, and then later jousted with Fan-tailed Flycatchers. The Tickell's is built in the style of a thickset boxer of the flycatcher world. Flashily dressed in a hoodie of shimmering blue-grey, from head to tail, and a rich rufous apron from chin to mid-abdomen, even though its sweet metallic notes belie aggression. It's hunting strategy is to sit still and then erupt into a quick short sally to capture its prey. A success rate of one in five dives seems pretty good. As time progressed I realized that I was actually seeing Mr. and Mrs. Tickell's Flycatcher. It was great to catch them displaying on a couple of occasions, within a few feet of where I sat. Unfortunately I did not see any signs of their

nest, though I caught them hunting in tandem for many days. No young have been seen either.

Dashing out from a perch, twisting and turning in midair to pluck insects out of thin air, the female Paradise Flycatcher is a striking combination of pointed black head gear, and rich rufous body. She kept dive bombing the Tickell's, but to no avail. She preferred to perch on the mango or the kamini offering a commanding view of the entire area. On many occasions I looked up to find her sitting a few feet above my head. Once she came within six feet of me and performed maneuvers 'for my eyes only'. I was bewitched, but she had other ideas. The last I saw of her was around the sixth of April. Hope to see her again this winter.

The bravest are the Ashy Prinias. Crows and Blyth's Reed Warblers give them a tough time. The dump provides for easy, satiating meals compared to the lurking dangers. Here were two individuals that pranced around in the plants, and before you knew it they were on the dump, long tails swishing left to right as they peeped below the grating for a hiding morsel.

The Blyth's Reed Warbler inhabiting the area was extremely shy and would not let me within ten meters. I saw very little of it, but its hard 'chuck, chuck' calls were easy to follow through the shrubs till mid-April.

In shinning black, wearing a necklace of white pearls on a black collar band on their whitish abdomen—their tails a Japanese fan in the hands of royalty—their shrill, complex call of 'Ti-tede-tede-ti-de' piercing the silence: I watched the Fan-tailed flycatchers (see photo on back cover); they were nesting in a bamboo thicket. Carrying twigs and cobwebs initially, later hurriedly carrying grubs, insects, throwing caution to the wind. Aggressively riding on the backs of crows or spinning circles around coucals and cats, harassing them into retreat. Now since mid-May they are frequenting the dump. The area they chose is quite disturbed, being the entrance of housing societies, where people and macaques wreck havoc regularly.

The fantails are now letting me in very close as parental duties no longer make them wary. They take chances of coming to the dump despite the scolding Tickell's, being very quick and even-tempered, with no time for petty squabbles. Hunting is a hoppity, skippity, jump, and dive after their prey that is plucked in mid-air. Tail flared in varying degree balancing the maneuvers. For all the energy this bird exudes, it's strike rate must be high in order to replenish all those calories. When the Tickell's Flycatcher's aggression became unbearable, they resorted to skimming around the mango's trunk, chasing their prey in a manner where they are unchallenged.

Cats, monkeys, squirrels, and also a mongoose have all come looking for goodies.

Squirrels pass by checking for a worthwhile snack, hustling along the limbs of the mango, ever watchful for suspicious characters, like myself, that the world at large must be warned about in a high-pitched, repetitive, 'chit chit' that resonates until the danger passes. They jump playfully from the building to the mango and circling the area in an aerial acrobatic feat.

A mongoose has been spotted many a time over the years. We surprised each other at the dump, till he sauntered away nonchalantly. Thus began a ritual bringing us face to face time and again, sometimes just three meters apart. One day I hope to get him in my frame.

– Badruddin Ali

Letter to the Editor

Is the Indian Peafowl *Pavo cristatus* moving higher up in the mountains? Withdrawal of two elevation records from Nepal

Thapa et al. (2020) reviewed the records for Indian Peafowl *Pavo cristatus* from Nepal and India to assess the evidence of the upward altitudinal movement of peafowl in the mountains. They used secondary data from eBird lists from Nepal, where 2,275 m in the Barekot area in Karnali (Bhusal 2016), and 3,532 m in Lantang National Park, Nepal (Gurung 2013), were mentioned as the range of elevation. The authors used the elevation of the location for which checklists were entered in eBird (www.eBird.org).

For further confirmation, we contacted the observers in Nepal to discuss their sightings and elevation details. These observers confirmed that the altitudinal elevations of peafowl greatly differed from the elevations mentioned in Thapa et al. (2020). Bhusal (2016) recorded peafowl in the Barekot area where the actual elevation is *c.*1,000 m asl (contra 2,275 m asl), and Gurung (2013) confirmed that his record was from Chitwan National Park (*c.*100–815 m asl), but had incorrectly marked it as Langtang National Park as they were birding from Chitwan to Langtang during that trip. So far, the confirmed highest elevation record of peafowl in Nepal is 3,196 m from Pyuthan, western mid hill (Khanal et al., in press).

We also contacted the corresponding author of Thapa et al. (2020) who accepted that the elevations they had taken were obtained from the eBird dataset (Lalit Kumar Sharma, *in litt*., e-mail dated 30 June 2020). We here request that the altitudinal elevation records mentioned in Thapa et al. (2020), from Nepal, be withdrawn. However, this does not impact the results and conclusions of that letter, as Peafowl has been recorded above 3,000 m in Nepal.

In general, the location accuracy of checklists/observations on citizen science platforms varies and we recommend caution while using them directly without assessing for potential errors. Effort and distance in the checklist is a good indicator of the accuracy, particularly while dealing with records in mountainous, non-uniform terrain and habitat. Other species in the same checklist are other useful indicators. Finally, it is always recommended to contact the original observer to verify the accuracy of these observations and make required adjustments, or entirely drop them, before analysis.

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