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COMMUNICATION

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A SHORT-TERM SURVEY REPORT ON THE POST-WINTER AVIAN DIVERSITY IN CORBETT NATIONAL PARK AND ASSOCIATED AREAS, UTTARAKHAND, INDIA

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Abstract: This study documents a short-term post-winter survey of avifaunal diversity in Corbett National Park and associated areas in Uttarakhand. Qualitative and quantitative avian diversity patterns were assessed from a biomonitoring and conservation perspective. A total of 94 species of birds belonging to 40 families under 15 orders were reported. Among these 10 were winter visitors, six summer visitors and one near-threatened species. Habitat distribution and foraging guild patterns are discussed. Insectivores and nectarivores were found to be the prominent foragers. Open woodland, cultivated land and forest edges provided shelter for many bird populations, while plantation areas supported the lowest numbers of species. The study area was exposed to varying levels of anthropogenic interventions, yet supported a healthy bird diversity with low dominance index.

Keywords: Anthropogenic intervention, avifaunal diversity, biomonitoring, dominance index, foraging guilds, habitat distribution, summer visitor, winter visitor.

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Author Contribution: SG has contributed in field observation, Data collection, Documentation and write-up. TB has contributed in data analysis, interpretation and write-up.

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INTRODUCTION

The Himalaya are a significant avian biodiversity hotspot, harbouring 977 endemic species of birds, of which eight are threatened and deserve special conservation priority (Karmakar et al. 2010). Western Himalaya is an important area for bird diversity, and it has been designated as Endemic Bird Area 28 (Corbett Tiger Reserve Bird Checklist 2001). The unique topography, climate, soil texture and vegetation patterns support diverse ecosystems, habitats, communities and species. The Corbett National Park (CNP), contains a mosaic of broad leaf mixed, dry deciduous, moist deciduous and conifer forests, and is a refuge for 549 species of birds (Corbett Tiger Reserve Bird Checklist 2001; Badola et al. 2010; Kidwai et al. 2013). Like many other parts of the country CNP is also suffering from habitat modification and resource alteration. The objectives of the present study are to prepare an inventory of avian diversity, including quantitative and qualitative assessments of community patterns in relation to existing habitat heterogeneity and foraging guilds, based on conventional niche dimensions like common foraging habitats and foraging components. Relative abundance values of the observed bird species were estimated to obtain an overall picture of community composition in the concerned regions.

MATERIALS AND METHODS

Study Site

Corbett National Park (CNP) is located in the foothills of western Himalaya in the districts of Nainital and Pauri Garhwal in the hill state of Uttarakhand, India (29.5300°N & 78.7747°E). A varied landscape of mosaic habitats prevails, consisting of wet and dry, plain and mountain, gentle and rugged, forests and grasslands crisscrossed by rivers, streams, ridges and wetlands fed by the Ramganga River and its tributaries prevails. Vegetation comprises of three broad categories: northern tropical moist deciduous, northern tropical dry deciduous, subtropical pine forest/shiwalik-chir-pine forest. A mosaic of dry and moist deciduous forest, scrub savannah and alluvial grassland is prominent. The most dominant and widely distributed species is *Shorea robusta*, followed by *Mallotus philippensis* and *Syzygium cumini*. Temperature ranges between 4°C in winter and 42°C in summer on average. Average annual rainfall ranges between 1,500-1,600 mm, most falling during the monsoon (June to September). Little rain may occur

in winter. The study was conducted in the last week of March 2015, representing a post-winter season with average temperature range of 6–12 °C.

Based on available literature and information collected from local forest management personnel, six representative sampling sites were selected, including open grassland, open woodland, forest edges, cultivated patches in buffer zones, dense vegetation with canopy coverage (dense forest) and sites related to water bodies. Each site was visited thrice a day between 07:00–09:00 hr, 11:00–13:00 hr and 15:00–17:00 hr, consecutively for four days. Time frames were selected to optimize observation of bird foraging and nesting in early morning and late afternoon, and resting during early afternoon. Bird census was conducted by following transects, point counts and territory mapping (Bibby et al. 1998). Point counts were used to estimate populations when the topography of the area was not 'open', involving a series of points or stations at which birds were counted (Gregory et al. 2004). Line transect methods were also applied wherever possible (Bibby et al. 1998).

All birds (sitting, perching, foraging, swimming and flying) were recorded and identified in their natural habitat and distribution areas following existing literature (Ali & Ripley 1983; Bibby et al. 1998; Kazmierczak & Perlo 2000; Grimmett et al. 2011; Praveen et al. 2016), either directly in the field, or from photographs. The assistance of well-trained guides was also relied upon.

Dominance index was calculated following McNaughton & Wolf's (1970) equation: $DI = 100 (Y_1 + Y_2) / Y$; where Y_1 and Y_2 are the number of individuals of the two most common species and Y is the total number of individuals belonging to all the species.

RESULTS AND DISCUSSION

This study documented 94 species (Table: 1) from CNP and nearby regions. Passeriformes was the dominant order comprising 19 families and 43 genera. Table 1 and Fig: 1 reveals that the orders Anseriformes, Cuculiformes, Gruiformes and Strigiformes were represented by single family and single genus each. Seventeen families viz., Anatidae, Cuculidae, Rallidae, Scolopacidae, Strigidae, Upupidae, Picidae, Coraciidae, Campephagidae, Vangidae, Aegithinidae, Rhipiduridae, Laniidae, Motacillidae, Alaudidae, Sylviidae, Certhidae were represented by single species. Three families Columbidae, Accipitridae and Muscicapidae each had maximum number of species (6). Only one



Figure 1. Study area - Corbett National Park

species (*Vanellus duvaucelii*) (Table 1) belonged to Near Threatened (NT) in IUCN Red List of Threatened Species category (IUCN 2014). Most of the species (78) encountered were residents and six species were strict winter visitors. Four winter visiting species viz. *Streptopelia orientalis*, *Charadrius dubius*, *Accipiter nisus* and *Alauda gula gula* sometimes were reported to stay yearlong in the CNP landscape. Likewise five summer visitors were also reported to stay back viz. *Upupa epops*, *Merops orientalis*, *Hirundo rustica*, *Ficedula tricolor*, *Ficedula supercilialis*. There was only one species of strict summer visitor viz., *Eumyias thalassinus* (Grimmet et al. 2011).

Table 1 also reveals that there were 11 common species with relative abundance exceeding 2.5%. *Psittacula cyanocephala* and *Pycnonotus cafer* were the most common species with relative abundance of 4.36% followed by *Dicrurus macrocercus* (3.63%), *Turdoides striata* (3.28%), *Acridotheres tristis* (3.28%), *Psittacula eupatria* (3.28%), *Bubulcus ibis* (3.38%), *Streptopelia chinensis* (2.99%) and *Merops orientalis* (2.79%), *Egretta garzetta* and *Acridotheres ginginianus* (2.65%) in that order. Dominance index (DI) was calculated to be 8.72. Such a low DI is indicative of the homogeneity of the bird community and reflects a relatively stress-free and equitable environment prevailing in CNP. McNaughton & Wolf (1970) showed that the DI increases with the harshness and decreases with the equitability of the environment. Karr (1971) opined that DI for avifauna

declined with the vegetation development. Changes in vegetation compositions along geographical and environmental gradients also influence varying trends of relative abundance of bird species (Lee & Rotenberry 2005).

Forest and edge offer habitats for diverse avian guilds. Increased floral structural complexity and floristic composition are often associated with enriched avian communities (Laislo 2002). As documented in Fig. 2, maximum number of species were supported by open woodland (21%) followed by the forest edge, grassland and cultivated land (15%). Wetlands also supported a considerable proportion (12%) but plantation areas despite their huge vegetation shelter being monoculture only nurture limited number (8%) of birds.

Same species may be represented with different observable densities in different forest types, reflecting microhabitat preferences and resource availability. Such differential distribution patterns were qualitatively documented for species like *Dicrurus hottentottus*, *Turdoides striata*, *Pycnonotus* sp., *Psittacula* sp. etc. in the present study. As they are becoming more specialized feeder rather than a generalised one depending on a particular vegetation type as food resource. The forest with most stable fixed pattern (e.g., Sal forests) entertained more specialist species. As documented in Fig. 2, the highest number (35) of visitor species frequent the mid canopy layer, followed by upper canopy and lower bush levels (30). Understorey, upper bush level and lower canopy also held moderate number of birds whereas wetlands like mud patches, stream banks were preferred by a specific and limited number of species which found that particular habitat suitable. Fifty-seven solitary, 40 pairs and 13 parties were observed in the present study. Often interspecific associations comprising of habitat specific ecological guilds were seen. The dietary guilds as observed are shown in Fig. 3. Carnivores (59%) top the list, followed by herbivores (31%), omnivores (7%) and scavengers (3%) in that order. Among carnivores, insectivores were the most dominant group comprising 60%. Among herbivores, no feeding guild was conspicuously dominant. Frugivores comprised 36%, nectarivores (33%) and graminivore (24%). Variation in foraging structure was caused by several factors like predation risk, physical framework of the habitat and microclimatic constraints (Cueto & Casenave 2002). Members of the same guild exploit the similar resources and become susceptible to potential competition over shared resources and in order to co-exist they would adopt mechanisms to reduce but not necessarily eliminate negative competitive interactions

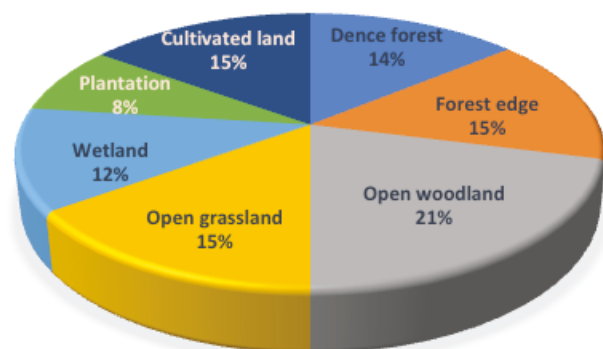


Figure 1. Habitat wise distribution pattern of observed species

(Simberloff & Dayan 1991; Palmer et al. 2003). Herein lies the importance of conserving species-specific habitat patches.

Another interesting finding was related to the appearance of wetland avifaunal distribution encompassing both semiaquatic (river bank, river beds, dam) and aquatic (short stream, pools, wetlands, watery scrubs, water logged marshlands) habitat patches dispersed within the forest stretches. Wetlands played the role of typical indicator of the health of the overall forest ecosystem as 20% of threatened bird species in India inhabit wetlands (IDFC 2002). Wetlands provide a favourable place for roosting and thermoregulation for some birds like *Mycteria leucocephala*. Potential threats to these wetland communities includes the agricultural runoffs, urban-industrial expansions; and dam constructions. Community based conservation measures should be taken to save these forest wetlands (Kingsford 2000). Of 33 species of wetland birds, documented herein, six were winter visitors and only one was a summer visitor.

In the present study, a total of 94 species belonging to 15 orders and 40 families were reported from different forest habitats, including terrestrial, aquatic and semi-aquatic stretches. The low Dominance Index revealed an overall healthy ecosystem. It is now the responsibility of administrative authorities and policy makers to maintain this important hub for avian species.

REFERENCES

- Badola, R., S.A. Hussain, B.K. Mishra, B. Konthoujam, S. Thapliyal & P.M. Dhakate (2010). An assessment of ecosystem services of Corbett Tiger Reserve, India. *Environmentalist* 7: 98–105.
- Bibby, C., M. Jones & S. Marsden (1998). *Expedition Field Techniques Bird Surveys*. Royal Geographic Society, London, 34–45pp.
- Corbett Tiger Reserve Bird Checklist (2001). *Birds of Corbett Tiger Reserve*. Ramnagar, 1–24pp.

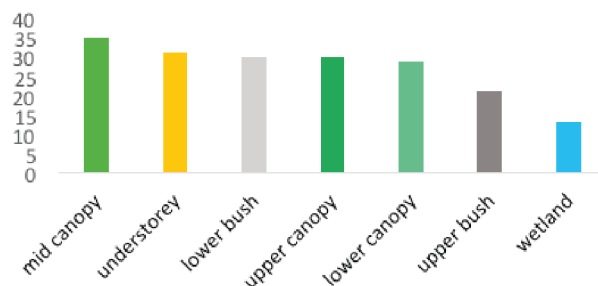


Figure 2. Number of species observed in different microhabitats

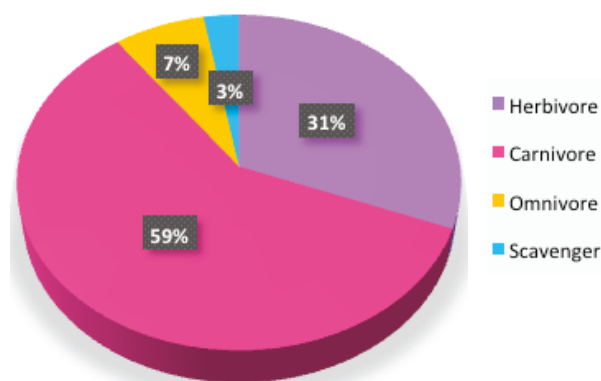


Figure 3. Distribution of the feeding guilds

- Cueto, R.V. & J.L. Casenave (2002). Foraging behavior and microhabitat use of birds inhabiting coastal woodlands in east central Argentina. *The Wilson Bulletin* 114(3): 342–348.
- Gregory, R.D., D.W. Gibbons & P.F. Donald (2004). Bird census and survey techniques. *Suther* 2: 17–54.
- Grimmett, R., C. Inskipp & T. Inskipp (2011). *Birds of the Indian Subcontinent*. Oxford University Press, Delhi, 528pp.
- IDFC (2002). Govt. of Uttaranchal, Food & Agri Division, Forestry & Rural Development Department, State Secretariat, Dehradun. *Agricultural Vision: Uttaranchal*, 14pp.
- IUCN (2014). The 2014 IUCN Red List of Threatened Animals. www.iucnredlist.org.
- Karmakar, S., T. Bhattacharya & S. Karmakar (2010). The status of endemic birds in three Indian hotspots. A review of available data. *Science and Culture* 76(11–12): 524–528.
- Karr, J.R. (1971). Structure of Avian Communities in Selected Panama and Illinois Habitats. *Ecological Monographs* 41(3): 272–283.
- Kazmierczak, K. & B.V. Perlo (2000). *A Field Guide to The Birds of the Indian Subcontinent*. Yale University Press, 352pp.
- Kidwai, Z., M. Matwal, U. Kumar, S. Shrotriya, F. Masood, Z. Moheb, N.A. Ansari & K. Singh (2013). Comparative study of bird community structure and function in two different forest types of Corbett National Park, Uttarakhand, India. *Asian Journal of Conservation Biology* 2(2): 157–163.
- Kingsford, R.T. (2000). Review: Ecological impacts of dams, water diversions and river management on floodplain wetlands in Australia. *Australian Ecology* 25: 109–127.
- Laislo, P. (2002). Effects of habitat structure, floral composition and diversity on a forest bird community in north-western Italy. *Folia Zoologica* 51: 121–128.
- Lee, P. & J.T. Rotenberry (2005). Relationships between bird species and tree species assemblages in forested habitats of eastern North America. *Journal of Biogeography* 32: 1139–1150.

Table 1. Species list of the observed avian fauna, their relative abundance and residential status. Nomenclature and taxonomy based on Praveen et al. (2016)

	Common name	Scientific name	Relative abundance (100.n/N)	Residential status
I. Order: Anseriformes				
1. Family: Anatidae				
1	Red-crested Pochard	<i>Netta rufina</i> (Pallas, 1773)	1.57	WV
II. Order: Galliformes				
2. Family: Phasianidae				
2	Red Jungle Fowl	<i>Gallus gallus</i> (Linnaeus, 1758)	0.15	R
3	Indian Peafowl	<i>Pavo cristatus</i> Linnaeus, 1758	1.08	R
4	Kalij Pheasant	<i>Lophura leucomelanos</i> (Latham, 1790)	0.39	R
III. Order: Columbiformes				
3. Family: Columbidae				
5	Rock Pigeon	<i>Columba livia</i> J.F. Gmelin, 1789	1.91	R
6	Emerald Dove	<i>Chalcophaps indica</i> (Linnaeus, 1758)	0.2	R
7	Oriental turtle Dove	<i>Streptopelia orientalis</i> (Latham, 1790)	0.15	R, WV
8	Spotted Dove	<i>Streptopelia chinensis</i> (Scopoli, 1786)	2.99	R
9	Laughing Dove	<i>Streptopelia senegalensis</i> (Linnaeus, 1766)	0.2	R
10	Eurasian Collared Dove	<i>Streptopelia decaocto</i> (Fridvaldsky, 1838)	0.15	R
IV. Order: Caprimulgiformes				
4. Family: Apodidae				
11	Asian Palm Swift	<i>Cypsiurus balaisensis</i> (J.E. Gray, 1829)	2.16	R
12	Himalayan Swiftlet	<i>Aerodramus brevirostris</i> (Horsfield, 1840)	0.44	R
13	Indian House Swift	<i>Apus affinis</i> (J.E. Gray, 1830)	1.87	R
V. Order: Cuculiformes				
5. Family: Cuculidae				
14	Greater Coucal	<i>Centropus sinensis</i> (Stephens, 1815)	0.2	R
VI. Order: Gruiformes				
6. Family: Rallidae				
15	White-breasted Waterhen	<i>Amaurornis phoenicurus</i> (Pennant, 1769)	0.44	R
VII. Order: Pelecaniformes				
7. Family: Ciconiidae				
16	Asian Openbill	<i>Anastomus oscitans</i> (Boddaert, 1783)	1.37	R
17	Painted Stork	<i>Mycteria leucocephala</i> (Pennant, 1769)	1.91	R
8. Family: Ardeidae				
18	Little Egret	<i>Egretta garzetta</i> (Linnaeus 1766)	2.65	R

	Common name	Scientific name	Relative abundance (100.n/N)	Residential status
19	Cattle Egret	<i>Bulbulcus ibis</i> (Linnaeus, 1758)	3.38	R
20	Black-crowned Night Heron	<i>Nycticorax nycticorax</i> (Linnaeus, 1758)	0.83	R
21	Indian Pond Heron	<i>Ardeola grayii</i> (Sykes, 1832)	2.16	R
9. Family: Phalacrocoracidae				
22	Little Cormorant	<i>Microcarbo niger</i> (Vieillot, 1817)	1.62	R
23	Great Cormorant	<i>Phalacrocorax carbo</i> (Linnaeus, 1758)	2.01	R
VIII. Order: Charadriiformes				
10. Family: Charadriidae				
*24	River Lapwing	<i>Vanellus duvaucelii</i> * (Lesson 1826)	0.79	R
25	Red-wattled Lapwing	<i>Vanellus indicus</i> (Boddaert, 1783)	0.54	R
26	Little Ringed Plover	<i>Charadrius dubius</i> Scopoli, 1786	0.4	R, WV
11. Family: scolopacidae				
27	Wood Sandpiper	<i>Tringa glareola</i> Linnaeus, 1758	0.54	WV
IX. Order: Accipitriformes				
12. Family: Accipitridae				
28	Black Kite	<i>Milvus migrans</i> (Boddaert, 1783)	0.4	R
29	Brahminy Kite	<i>Haliastur indus</i> (Boddaert, 1783)	0.15	R
30	Crested Serpent Eagle	<i>Splinteris Cheela</i> (Latham, 1790)	0.2	R
31	Northern Goshawk	<i>Accipiter gentilis</i> (Linnaeus, 1758)	0.1	WV
32	Eurasian Sparrowhawk	<i>Accipiter nisus</i> (Linnaeus, 1758)	0.05	R, WV
33	Shikra	<i>Accipiter badius</i> (J.F. Gmelin, 1788)	0.1	R
X. Order: Strigiformes				
13. Family: Strigidae				
34	Spotted Owlet	<i>Athene brama</i> (Temminck, 1821)	0.15	R
XI. Order: Bucerotiformes				
14. Family: Bucerotidae				
35	Oriental Pied Hornbill	<i>Anthraceroceros albirostris</i> (Shaw, 1808)	0.88	R
36	Indian Grey Hornbill	<i>Ocyrceros birostris</i> (Scopoli, 1786)	1.81	R
15. Family: Upupidae				
37	Common Hoopoe	<i>Upupa epops</i> Linnaeus, 1758	0.4	R, SV
XII. Order: Piciformes				
16. Family: Picidae				
38	Lesser Golden-backed Woodpecker	<i>Dinopium benghalense</i> (Linnaeus, 1758)	0.29	R
17. Family: Ramphastidae				
39	Great Barbet	<i>Psilopogon virens</i> (Boddaert, 1783)	0.1	R

	Common name	Scientific name	Relative abundance (100.n _i /N)	Residential status
40	Brown-headed Barbet	<i>Psilopogon zeylanicus</i> (J.F. Gmelin, 1788)	0.2	R
41	Lineated Barbet	<i>Psilopogon lineatus</i> (Vieillot, 1816)	0.54	R
42	Blue throated Barbet	<i>Psilopogon asiaticus</i> (Latham, 1790)	0.69	R
43	Coppersmith Barbet	<i>Psilopogon haemocephalus</i> (StatiusMuller, 1766)	0.54	R
XIII. Order: Coraciiformes				
18. Meropidae				
44	Green Bee-eater	<i>Merops orientalis</i> Latham, 1801	2.79	R, SV
45	Blue-tailed Bee-eater	<i>Merops philippinus</i> Linnaeus, 1767	1.62	WV
19. Family: Coraciidae				
46	Indian Roller	<i>Coracias benghalensis</i> (Linnaeus, 1758)	0.54	R
20. Family: Alcedinidae				
47	Common Kingfisher	<i>Alcedo atthis</i> (Linnaeus, 1758)	0.93	R
48	White-throated Kingfisher	<i>Halcyon smyrnensis</i> (Linnaeus, 1758)	1.42	R
XIV. Order: Psittaciformes				
21. Family: Psittacidae				
49	Alexandrine Parakeet	<i>Psittacula eupatria</i> (Linnaeus, 1766)	3.28	R
50	Rose-ringed Parakeet	<i>Psittacula krameria</i> (Scopoli, 1769)	2.35	R
51	Plum-headed Parakeet	<i>Psittacula cyanocephala</i> (Linnaeus, 1766)	4.36	R
XV. Order: Passeriformes				
22. Family: Campephagidae				
52	Scarlet Minivet	<i>Pericrocotus flammeus</i> (J.R. Forster, 1781)	0.93	R
23. Family: Oriolidae				
53	Maroon Oriole	<i>Oriolus trailii</i> (Vigors, 1832)	0.05	R
54	Indian Golden Oriole	<i>Oriolus kundoo</i> Sykes, 1832	0.39	R
55	Black-hooded Oriole	<i>Oriolus xanthornus</i> (Linnaeus, 1758)	0.93	R
24. Family: Vangidae				
56	Common Wood Shrike	<i>Tephrodornis pondicerianus</i> (J.F. Gmelin, 1789)	0.2	R
25. Family: Aegithinidae				
57	Common Iora	<i>Aegithina tiphia</i> (Linnaeus, 1758)	0.2	R
26. Family: Dicruridae				
58	Hair-crested (Spangled) Drongo	<i>Dicrurus hottentottus</i> (Linnaeus, 1766)	0.3	R

	Common name	Scientific name	Relative abundance (100.n _i /N)	Residential status
59	Greater Racket-tailed Drongo	<i>Dicrurus paradiseus</i> (Linnaeus, 1766)	0.1	R
60	Black Drongo	<i>Dicrurus macrocercus</i> Vieillot, 1817	3.63	R
61	Ashy Drongo	<i>Dicrurus leucophaeus</i> Vieillot, 1817	1.13	R
27. Family: Rhipiduridae				
62	White-throated Fantail	<i>Rhipidura albicollis</i> (Vieillot, 1818)	0.44	R
28. Family: Laniidae				
63	Brown Shrike	<i>Lanius cristatus</i> Linnaeus, 1758	1.03	WV
29. Family: Corvidae				
64	Large-billed Crow	<i>Corvus macrorhynchos</i> Wagler, 1827	1.77	R
65	Yellow-billed Blue Magpie	<i>Urocissa flavirostris</i> (Blyth, 1846)	0.1	R
66	Rufous Tree Pie	<i>Dendrocitta vagabunda</i> (Latham, 1790)	0.59	R
30. Family: Nectariniidae				
67	Purple Sunbird	<i>Cinnyris asiaticus</i> (Latham, 1790)	0.59	R
68	Green-tailed Sunbird	<i>Aethopyga nipalensis</i> (Hodgson, 1836)	0.29	R
69	Crimson Sunbird	<i>Aethopyga siparaja</i> (Raffles, 1822)	0.1	R
31. Family: Motacillidae				
70	Western Yellow Wagtail	<i>Motacilla flava</i> Linnaeus, 1758	0.74	WV
32. Family: Alaudidae				
71	Oriental Skylark	<i>Alauda gulgula</i> Franklin, 1831	0.34	R, WV
33. Family: Cisticolidae				
72	Common Tailorbird	<i>Orthotomus sutorius</i> (Pennant 1769)	2.35	R
73	Plain Prinia	<i>Prinia ionornata</i> Sykes, 1832	0.54	R
74	Ashy Prinia	<i>Prinia socialis</i> Sykes, 1832	0.39	R
34. Family: Hirundinidae				
75	Barn Swallow	<i>Hirundo rustica</i> Linnaeus, 1758	2.1	R,SV
76	Plain Martin	<i>Riparia paludicola</i> (Vieillot, 1817)	0.88	R
35. Family: Pycnonotidae				
77	Red-vented Bulbul	<i>Pycnonotus cafer</i> (Linnaeus, 1766)	4.36	R
78	Red-whiskered Bulbul	<i>Pycnonotus jocosus</i> (Linnaeus, 1758)	1.13	R
79	Black-crested Bulbul	<i>Pycnonotus melanicterus</i> (J.F. Gmelin, 1789)	0.93	R

	Common name	Scientific name	Relative abundance (100.n/N)	Residential status
80	Himalayan Bulbul	<i>Pycnonotus leucogenis</i> (J.E. Gray, 1835)	0.54	R
36. Family: Sylviidae				
81	White-browed Fulvetta	<i>Fulvetta vinipectus</i> (Hodgson, 1837)	0.2	R
37. Leithrochidae				
82	Jungle Babbler	<i>Turdoides striata</i> (Dumont, 1823)	3.28	R
83	White-throated Laughing Thrush	<i>Garrulax albogularis</i> (Gould, 1836)	0.29	R
38. Family: Certhiidae				
84	Bar-tailed Treecreeper	<i>Certhia himalayana</i> Vigors, 1832	0.3	R
39. Family: Sturnidae				
85	Common Myna	<i>Acridotheres tristis</i> (Linnaeus, 1766)	3.28	R
86	Asian Pied Starling	<i>Gracupica contra</i> (Linnaeus, 1758)	2.4	R

	Common name	Scientific name	Relative abundance (100.n/N)	Residential status
87	Bank Myna	<i>Acridotheres ginginianus</i> (Latham, 1790)	2.65	R
88	Brahminy Starling	<i>Sturnia pagodarum</i> (J.F. Gmelin, 1789)	1.57	R
40. Family: Muscicapidae				
89	Oriental Magpie Robin	<i>Copsychus saularis</i> (Linnaeus, 1758)	1.08	R
90	Rufous-bellied Niltava	<i>Niltava sundara</i> Hodgson, 1837	0.2	R
91	Verditer Flycatcher	<i>Eumyias thalassinus</i> (Swainson, 1838)	0.1	SV
92	Ultramarine Flycatcher	<i>Ficedula supercilialis</i> (Jerdon, 1840)	0.15	R, SV
93	Slaty Blue Flycatcher	<i>Ficedula tricolor</i> (Hodgson, 1845)	0.05	R, SV
94	Brown Rock Chat	<i>Oenanthe fusca</i> (Blyth, 1851)	1.62	R

R = residential, WV = winter visitor, SV = summer visitor; * - Near Threatened (IUCN Red List Category Ver.3.1) [IUCN 2014]
 R = 78 species, WV = 6 species, SV = 1 species, R,WV = 4 species, R,SV = 5 species; Common species RA>2.5= 11

McNaughton, S.J. & L.L. Wolf (1970). Dominance and Niche in Ecological Systems. *Science* 167(3915): 131–136.
Palmer, T.M., M.L. Stanton & T.P. Young (2003). Competition and coexistence: exploring mechanisms that restrict and maintain diversity within mutualist guilds. *American Naturalist* 162: 563–579.
Praveen J., R. Jayapal & A. Pittie (2016). A checklist of the birds of India. *Indian Birds* (5&6): 113–172.
Simberloff, D. & T. Dayan (1991). The guild concept and the structure of ecological communities. *Annual Review of Ecology and Systematics* 22: 115–143.





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