

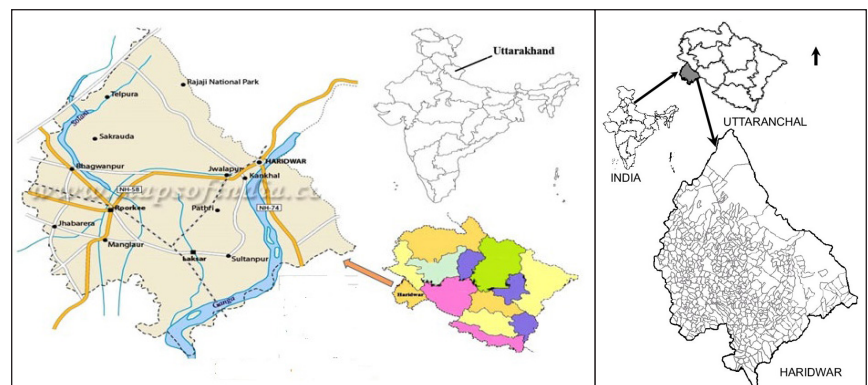
## A checklist of birds of Haridwar, Uttarakhand



Birds are thought to be excellent biological indicators that reflect the health conditions of ecosystems (Collar & Andrew 1988) and its high and low diversities are directly related to environmental conditions of any area (Loreau et al. 2001). The change in the vegetation cover has also affected the diversity, abundance, and distribution of avian species (Gregory et al. 2010; Balodi et al. 2018). Many avian species migrate from short to very long distances in search

of favorable environmental conditions; meanwhile, other species are non-migratory and spend their life cycle in a particular area (Arya et al. 2019). Haridwar hosts many resident avian

species as well as migratory birds (Bhatt et al. 2015). A number of migratory avian species visits Chilla Forest Range, Bheemgoda Barrage, Missarpur Ganga Ghat, Gurukula Kangri University



**Fig 1. Map of the Study Area. (Source: Map of India)**

## Checklist of birds of Haridwar

	Family	Name	Scientific name	Status	Status IUCN
1	Accipitridae	Bonelli's Eagle	<i>Aquila fasciata</i>	R	LC
2		Crested Serpent Eagle	<i>Spilornis cheela</i>	R	LC
3		Changeable Hawk Eagle	<i>Nisaetus (cirrhatu)s limnaeetus</i>	R	LC
4		Palla's Fish Eagle	<i>Haliaeetus leucoryphus</i>	<b>RM</b>	<b>EN</b>
5		Oriental Honey Buzzard.	<i>Pernis ptilorhynchus</i>	R	LC
6		Short-toed Snake Eagle	<i>Circaetus Gallicus</i>	R	LC
7		Steppe Eagle	<i>Aquila nipalensis</i>	R	<b>EN</b>
8		Black Kite	<i>Milvus migrans</i>	R	LC
9		Black-winged Kite	<i>Elanus caeruleus</i>	R	LC
10		Shikra	<i>Accipiter badius</i>	R	LC
11		Cinereous Vulture	<i>Aegypius monachus</i>	<b>WM</b>	<b>NT</b>
12		Egyptian Vulture	<i>Neophron percnopterus</i>	R	<b>EN</b>
13		Griffon Vulture	<i>Gyps fulvus</i>	<b>WM</b>	LC
14		Himalayan Vulture	<i>Gyps himalayensis</i>	<b>WM</b>	<b>NT</b>
15		Red-headed Vulture	<i>Sarcogyps calvus</i>	<b>RM</b>	<b>CR</b>
16		White-rumped Vulture	<i>Gyps bengalensis</i>	<b>RM</b>	CR
17	Aegithinidae	Common Iora	<i>Aegithina tiphia</i>	R	LC
18	Alcedinidae	Common Kingfisher	<i>Alcedo atthis</i>	R	LC
19		White-throated Kingfisher	<i>Halcyon smyrnensis</i>	R	LC
20		Pied Kingfisher	<i>Ceryle rudis</i>	R	LC
21		Crested Kingfisher	<i>Megaceryle lugubris</i>	R	LC
22		Stork-billed Kingfisher	<i>Pelargopsis capensis</i>	<b>WM</b>	LC
23	Anatidae	Indian Spot-billed Duck	<i>Anas poecilorhyncha</i>	R	LC
24		Ruddy Shelduck	<i>Tadorna ferruginea</i>	<b>WM</b>	LC
25		Northern Pintail	<i>Anas acuta</i>	<b>RM</b>	LC
26		Mallard	<i>Anas platyrhynchos</i>	<b>WM</b>	LC
27		Red-crested Pochard	<i>Netta rufina</i>	<b>WM</b>	LC
28		Bar-headed Goose	<i>Anser indicus</i>	<b>WM</b>	LC
29	Anhingidae	Oriental Darter	<i>Anhinga melanogaster</i>	R	<b>NT</b>
30	Ardeidae	Indian Pond Heron	<i>Ardeola grayii</i>	R	LC
31		Grey Heron	<i>Ardea cinerea</i>	R	LC
32		Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	R	LC
33		Purple Heron	<i>Ardea purpurea</i>	R	LC
34		Yellow Bittern	<i>Ixobrychus sinensis</i>	R	LC
35	Bucerotidae	Indian Grey Hornbill	<i>Ocyroceros birostris</i>	R	LC
36		Oriental Pied- Hornbill	<i>Anthracoceros albirostris</i>	R	LC
37		Great Hornbill	<i>Buceros bicornis</i>	R	<b>NT</b>

	Family	Name	Scientific name	Status	Status IUCN
38	Burhinidae	Stone-Curlew	<i>Burhinus oedicephalus</i>	R	LC
39	Campephagidae	Scarlet Minivet	<i>Pericrocotus (flammeus) speciosus</i>	R	LC
40		Small Minivet	<i>Pericrocotus cinnamomeus</i>	R	LC
41		Rosy Minivet	<i>Pericrocotus roseus</i>	R	LC
42		Long-tailed Minivet	<i>Pericrocotus ethologus</i>	R	LC
43		Charadriidae	Red-wattled Lapwing	<i>Vanellus indicus</i>	R
44	River Lapwing		<i>Vanellus duvaucelii</i>	R	<b>NT</b>
45	Yellow-wattled Lapwing		<i>Vanellus malabaricus</i>	R	LC
46	Little Ringed Plover		<i>Charadrius dubius</i>	R	LC
47	Chloropseidae	Golden-fronted Leaf bird	<i>Chloropsis aurifrons</i>	R	LC
48	Ciconiidae	Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	<b>WM</b>	<b>NT</b>
49		Black Stork	<i>Ciconia nigra</i>	<b>WM</b>	LC
50		Painted Stork	<i>Mycteria leucocephala</i>	<b>WM</b>	<b>NT</b>
51		Woolly-necked Stork	<i>Ciconia episcopus</i>	<b>WM</b>	<b>VU</b>
52	Cisticolidae	Ashy Prinia	<i>Prinia socialis</i>	R	LC
53		Grey-breasted Prinia	<i>Prinia hodgsonii</i>	R	LC
54		Zitting Cisticola	<i>Cisticola juncidis</i>	R	LC
55		Striated Prinia	<i>Prinia criniger</i>	R	LC
56		Common Tailorbird	<i>Orthotomus sutorius</i>	R	LC
57	Columbidae	Emerald Dove	<i>Chalcophaps indica</i>	R	LC
58		Oriental Turtle Dove	<i>Streptopelia orientalis</i>	R	LC
59		Eurasian Collared Dove	<i>Streptopelia decaocto</i>	R	LC
60		Red Collared Dove	<i>Streptopelia tranquebarica</i>	R	LC
61		Spotted Dove	<i>Stigmatopelia chinensis</i>	R	LC
62		Laughing Dove	<i>Stigmatopelia asenegalensis</i>	R	LC
63		Common Pigeon	<i>Columba livia</i>	R	LC
64		Yellow-footed Green Pigeon	<i>Treron phoenicopterus</i>	R	LC
65	Coraciidae	Indian Roller	<i>Coracias benghalensis</i>	R	LC
66	Corvidae	Indian Jungle Crow	<i>Corvus ulminates</i>	R	LC
67		Large-billed Crow	<i>Corvus macrorhynchos</i>	R	LC
68		House Crow	<i>Corvus splendens</i>	R	LC
69		Rufous-Treepie	<i>Dendrocitta vagabunda</i>	R	LC
70		Grey-Treepie	<i>Dendrocitta formosae</i>	R	LC

	Family	Name	Scientific name	Status	Status IUCN
71	Cuculidae	Asian Koel	<i>Eudynamys scolopaceus</i>	R	LC
72		Greater Coucal	<i>Centropus sinensis</i>	R	LC
73		Common Hawk Cuckoo	<i>Hieroccyx varius</i>	R	
74		Indian Cuckoo	<i>Cuculus micropterus</i>	R	LC
75		Eurasian Cuckoo	<i>Cuculus canorus</i>	R	LC
76		Jacobin Cuckoo	<i>Clamator jacobinus</i>	<b>WM</b>	LC
77		Grey-bellied Cuckoo	<i>Cacomantis merulinus</i>	R	LC
78	Dicruridae	Ashy Drongo	<i>Dicrurus leucophaeus</i>	R	LC
79		Spangled Drongo	<i>Dicrurus hottentottus</i>	<b>WM</b>	LC
80		Black Drongo	<i>Dicrurus macrocercus</i>	R	LC
81		White-bellied Drongo	<i>Dicrurus caerulescens</i>	R	LC
82	Dicaeidae	Thick-billed Flowerpecker	<i>Dicaeum Agile</i>	R	LC
83		Pale-billed Flowerpecker	<i>Dicaeum erythrorhynchos</i>	R	LC
84	Emberizidae	White-capped Bunting	<i>Embriza stewarti</i>	<b>RM</b>	LC
85	Estrilidae	Scaly-Breasted Munia	<i>Lonchura punctulata</i>	R	LC
86		Indian Silverbill	<i>Euodice malabarica</i>	R	LC
87		Tricoloured Munia	<i>Lonchura malacca</i>	<b>RM</b>	LC
88	Falconidae	Collared Falconet	<i>Microhierax caerulescens</i>	<b>RM</b>	LC
89		Shaheen Falcon	<i>Falco peregrinus peregrinator</i>	M	LC
90	Fringillidae	Yellow-breasted Greenfinch	<i>Chloris spinoides</i>	<b>RM</b>	LC
91	Hirundinidae	Barn Swallow	<i>Hirundo rustica</i>	R	LC
92		Streak-throated Swallow	<i>Petrochelidon fluvicola</i>	R	LC
93		Wire-tailed Swallow	<i>Hirundo smithii</i>	R	LC
94		Red-rumped Swallow	<i>Cecropis daurica</i>	R	LC
95		Dusky Crag Martin	<i>Ptyonoprogne concolor</i>	R	LC
96	Laniidae	Bay-Backed Shrike	<i>Lanius vittatus</i>	R	LC
97		Long-tailed Shrike	<i>Lanius schach</i>	R	LC
98		Large Cuckoo Shrike	<i>Tephrodornis virgatus</i>	R	LC
99	Leiothrichidae	White-crested Laughingthrush	<i>Garrulax leucolophus</i>	R	LC
100		Jungle Babbler	<i>Turdoides striata</i>	R	LC
101		Red-billed leiothrix	<i>Leiothrix lutea</i>	R	LC
102		Rufous Sibia	<i>Heterophasia capistrata</i>	R	LC
103	Laridae	Palla's Gull	<i>Ichthyaetus ichthyaetus</i>	<b>WM</b>	LC
104		Brown-headed Gull	<i>Chroicocephalus brunnicephalus</i>	<b>WM</b>	LC
105		Black-headed Gull	<i>Chroicocephalus ridibundus</i>	<b>WM</b>	LC
106		Bar-headed Goose	<i>Anser indicus</i>	<b>WM</b>	LC
107		Indian River Tern	<i>Sterna aurantia</i>	<b>WM</b>	<b>NT</b>
108	Megalaimidae	Coppersmith Barbet	<i>Megalaima haemacephala</i>	R	LC
109		Blue-throated Barbet	<i>Megalaima asiatica</i>	R	LC
110		Brown Headed Barbet	<i>Megalaima zeylanica</i>	R	LC
111		Lineated Barbet	<i>Megalaima lineata</i>	R	LC
112		Great Barbet	<i>Megalaima zeylanica</i>	R	LC

	Family	Name	Scientific name	Status	Status IUCN
113	Meropidae	Blue-Bearded Bee-eater	<i>Nyctornis athertoni</i>	R	LC
114		Blue-tailed Bee-eater	<i>Merops philippinus</i>	R	LC
115		Green Bee-eater	<i>Merops orientalis</i>	R	LC
116		Chestnut headed Bee-eater	<i>Merops leschenaultia</i>	R	LC
117	Motacillidae	White Wagtail	<i>Motacilla alba</i>	<b>RM</b>	LC
118		Grey Wagtail	<i>Motacilla cinerea</i>	<b>RM</b>	LC
119		Citrine Wagtail	<i>Motacilla citreola</i>	<b>RM</b>	LC
120		Yellow Wagtail	<i>Motacilla flava</i>	<b>RM</b>	LC
121		White-browed Wagtail	<i>Motacilla maderaspatensis</i>	<b>RM</b>	LC
122	Monarchidae	Indian Paradise Flycatcher	<i>Terpsiphone paradisi</i>	R	LC
123	Muscicapidae	Little Forktail	<i>Enicurus scouleri</i>	R	LC
124		Blue Whistling Thrush	<i>Myophonus caeruleus</i>	R	LC
125		Chestnut-bellied Rock Thrush	<i>Monticola rufiventris</i>	R	LC
126		Blue-capped Rock Thrush	<i>Monticola cinclorhynchus</i>	R	LC
127		Black-throated Thrush	<i>Turdus atrogularis</i>	R	LC
128		Indian Robin	<i>Copsychus fulicatus</i>	R	LC
129		Oriental Magpie Robin	<i>Copsychus saularis</i>	R	LC
130		White-capped Water Redstart	<i>Chaimrrornis leucocephalus</i>	<b>RM</b>	LC
131		Plumbeous Water Redstart	<i>Rhyacornis fuliginosa</i>	<b>RM</b>	LC
132		Black Redstart	<i>Phoenicurus ochruros</i>	<b>WM</b>	LC
133		Grey Bushchat	<i>Saxicola ferreus</i>	R	LC
134		Pied Bushchat	<i>Saxicola caprata</i>	R	LC
135		Bluethroat	<i>Luscinia svecica</i>	<b>WM</b>	LC
136		Small Niltava	<i>Niltava macgrigoriae</i>	<b>RM</b>	LC
137		Slaty-blue Flycatcher	<i>Ficedula tricolor</i>	R	LC
138		Blue-throated Blue Flycatcher	<i>Cyornis rubeculoides</i>	R	LC
139		Taiga Flycatcher	<i>Ficedula albicilla</i>	<b>RM</b>	LC
140		Tickell's Blue Flycatcher	<i>Cyornis tickelliae</i>	R	LC
141		Red-breasted Flycatcher	<i>Ficedula albicilla</i>	<b>RM</b>	LC
142		Ultramarine Flycatcher	<i>Ficedula superciliaris</i>	<b>RM</b>	LC
143	Verdict's Flycatcher	<i>Eumyias thalassinus</i>	R	LC	
144	Nectariniidae	Purple Sunbird	<i>Cinnyris asiaticus</i>	R	LC
145		Crimson Sunbird	<i>Aethopyga siparaja</i>	R	LC
146	Oriolini	Black-hooded Oriole	<i>Oriolus xanthornus</i>	R	LC
147		Maroon Oriole	<i>Oriolus trailii</i>	R	LC
148		Indian Golden Oriole	<i>Oriolus kundoo</i>	R	LC
149	Paridae	Great Tit	<i>Parus major</i>	R	LC
150		Green-backed Tit	<i>Parus monticolus</i>	R	LC
151		Fire-capped Tit	<i>Cephalopyrus flammiceps</i>	R	LC
152		Black-throated Tit	<i>Aegithalos concinnus</i>	R	LC

	Family	Name	Scientific name	Status	Status IUCN
153	Passeridae	House Sparrow	<i>Passer domesticus</i>	R	LC
154		Russet Sparrow	<i>Passer cinnamomeus</i>	R	LC
155		Chestnut-shouldered Petronia	<i>Gymnoris xanthocollis</i>	R	LC
156	Paradoxornithidae	Yellow-eyed Babbler	<i>Chrysomma sinense</i>	R	LC
157	Pellorneidae	Puff-throated Babbler	<i>Pellorneum ruficeps</i>	R	LC
158	Phalacrocoracidae	Great Cormorant	<i>Phalacrocorax carbo</i>	R	LC
159		Little Cormorant	<i>Phalacrocorax niger</i>	R	LC
160	Phasianidae	Red Jungle Fowl	<i>Gallus gallus</i>	R	LC
161		Indian Peafowl	<i>Pavo cristatus</i>	R	LC
162		Grey Francolin	<i>Francolinus pondicerianus</i>	R	LC
163		Black Francolin	<i>Francolinus francolinus</i>	R	LC
164		Khalij Pheasant	<i>Lophura leucomelanos</i>	R	LC
165		Chukar Partridge	<i>Alectoris chukar</i>	R	LC
166		Phylloscopidae	Grey-Hooded Warbler	<i>Phylloscopus xanthoschistos</i>	R
167	Tickell's Leaf Warbler		<i>Phylloscopus affinis</i>	R	LC
168	Sulphur-bellied Warbler		<i>Phylloscopus griseolus</i>	R	LC
169	Lemon-rumped Warbler		<i>Phylloscopus chloronotus</i>	R	LC
170	Hume's Warbler		<i>Phylloscopus humei</i>	R	LC
171	Picidae	Fulvous-breasted Woodpecker	<i>Dendrocopos macei</i>	R	LC
172		Brown-capped Pygmy Woodpecker	<i>Dendrocopos nanus</i>	R	LC
173		Lesser Golden-backed Woodpecker	<i>Dinopium benghalense</i>	R	LC
174		Rufous Woodpecker	<i>Micropternus brachyurus</i>	R	LC
175		Brown-fronted Woodpecker	<i>Dendrocopos auriceps</i>	R	LC
176		Lesser Yellow-naped Woodpecker	<i>Picus chlorolophus</i>	R	LC
177		Greater Yellow-naped Woodpecker	<i>Picus flavinucha</i>	R	LC
178		Himalayan Golden-backed Woodpecker	<i>Dinopium shorii</i>	R	LC
179		Greater Golden-backed Woodpecker	<i>Chrysocolaptes lucidus</i>	R	LC
180		White-naped Woodpecker	<i>Chrysocolaptes festivus</i>	R	LC
181		Streak-throated Woodpecker	<i>Picus xanthopygaeus</i>	R	LC
182	Wryneck	<i>Jynx torquilla</i>	<b>WM</b>	LC	
183	Pittidae	Indian Pitta	<i>Pitta brachyura</i>	R	LC
184	Psittaculidae	Plum-headed Parakeet	<i>Psittacula cyanocephala</i>	R	LC
185		Alexandrine Parakeet	<i>Psittacula eupatria</i>	R	NT
186		Rose-ringed Parakeet	<i>Psittacula krameri</i>	R	LC
187		Slaty-headed Parakeet	<i>Psittacula himalayana</i>	R	LC

	Family	Name	Scientific name	Status	Status IUCN
188	Pycnonotidae	Ashy Bulbul	<i>Hemixos flava</i>	R	LC
189		Himalayan Bulbul	<i>Pycnonotus leucogenys</i>	R	LC
190		Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>	R	LC
191		Red-vented Bulbul	<i>Pycnonotus cafer</i>	R	LC
192		Black-crested Bulbul	<i>Pycnonotus (melanicterus) flaviventris</i>	R	LC
193	Rallidae	White-breasted Waterhen	<i>Amaurornis phoenicurus</i>	R	LC
194	Rhipiduridae	White-browed Fantail	<i>Rhipidura aureola</i>	R	LC
195		White-throated Fantail	<i>Rhipidura albicollis</i>	R	LC
196	Saxicolinae	Brown Rock Chat	<i>Oenanthe fusca</i>	R	LC
197	Scolopacidae	Green Sandpiper	<i>Tringa ochropus</i>	R	LC
198		Common Sandpiper	<i>Actitis hypoleucos</i>	R	LC
199		Common Greenshank	<i>Tringa nebularia</i>	R	LC
200	Sittidae	Chestnut-bellied Nuthatch	<i>Sitta (castanea) cinnamoventris</i>	R	LC
201		Velvet-fronted Nuthatch	<i>Sitta frontalis</i>	R	LC
202	Stenostiridae	Grey-headed Canary-Flycatcher	<i>Culicicapa ceylonensis</i>		
203		Yellow-bellied Fantail	<i>Chelidorhynch hypoxantha</i>	R	LC
204	Strigidae	Barn Owl	<i>Tyto alba</i>	R	LC
205		Indian Scops Owl	<i>Otus bakkamoena</i>	R	LC
206		Spotted Owlet	<i>Athene brama</i>	R	LC
207		Jungle Owlet	<i>Glaucidium radiatum</i>	R	LC
208		Brown Fish Owl	<i>Ketupa zeylonensis</i>	R	LC
209	Sturnidae	Brahminy Starling	<i>Sturnia pagodarum</i>	R	LC
210		Common Starling	<i>Sturnus vulgaris</i>	<b>WM</b>	LC
211		Asian Pied Starling	<i>Gracupica contra</i>	R	LC
212		Common Myna or Indian Myna	<i>Acridotheres tristis</i>		
213		Bank Myna	<i>Acridotheres ginginianus</i>	R	LC
214	Sylviidae	Lesser Whitethroat	<i>Sylvia curruca</i>	R	LC
215	Treskiornithidae	Red-naped Ibis	<i>Pseudibis papillosa</i>	R	LC
216		Black-headed Ibis	<i>Threskiornis melanocephalus</i>	R	NT
217		Glossy Ibis	<i>Plegadis falcinellus</i>	R	LC
218	Tichodromadidae	Wallcreeper	<i>Tichodroma muraria</i>	<b>RM</b>	LC
219	Timaliidae	Tawny-bellied Babbler	<i>Dumetia hyperythra</i>	R	LC
220		Black-chinned Babbler	<i>Cyanoderma pyrrhops</i>	R	LC
221	Turdidae	Orange-headed Thrush	<i>Zoothera citrina</i>	R	LC
222		Scaly Thrush	<i>Zoothera dauma</i>	<b>RM</b>	LC
223	Upupidae	Common Hoopoe	<i>Upupa epops</i>		
224	Vangidae	Bar-winged Flycatcher-shrike	<i>Hemipus picatus</i>	R	LC
225		Common Woodshrike	<i>Tephrodornis pondicerianus</i>	R	LC
226	Zosteropidae	Indian White-eye	<i>Zosterops palpebrosus</i>	R	LC

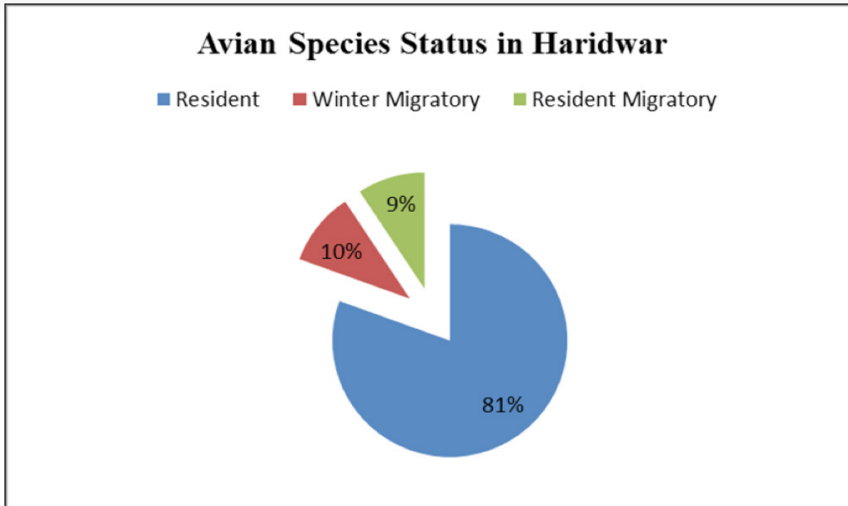


Fig 2. Avian species status in study area.

campus, Haridwar and Rajaji National Park of Haridwar District (which is parallel to river Ganga) every year from different parts of the world through central Asian Flyway, East Asian Australian Flyway & West Pacific Flyway etc. Most of the migratory birds arrived in India through Asian-Central Flyways. Some of these fly

over the higher Himalaya to reach India. We observed the resident and migratory avian species from 2017–2020 and prepared a checklist of avian species. The research area consists of a forest cover and river Ganga which provides plenty of food and shelter to these birds for their breeding and roosting. We recorded a total number of

226 species of birds in the district Haridwar, Uttarakhand that includes 57 water birds. Twelve species fall under the various categories of IUCN. This study was conducted in urban, suburban and wetlands/Ganga River and Chilla Forest Range of Rajaji National Park (29.96861°N, 78.19861°E), Bheemgoda Barrage (29.95638°N, 78.18083°E), Missarpur Ganga Ghat (29.89055°N, 78.14027°E) and adjacent areas in Haridwar.

We observed the resident and migratory avian species from 2017 to 2020 and prepared a checklist. Field visits were made almost fortnightly to these sites. Line transects and point count methods were used

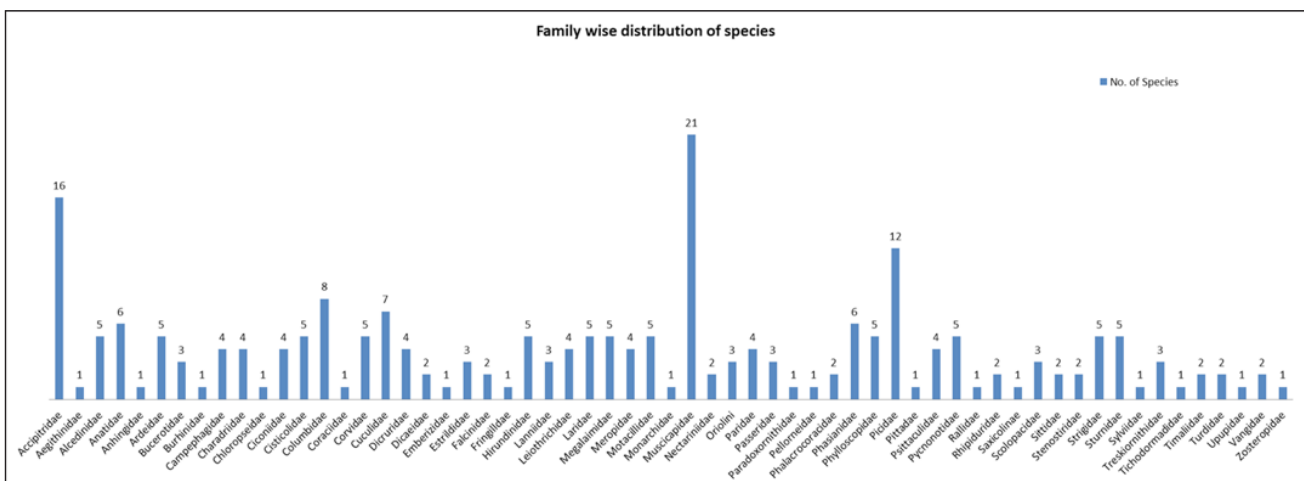


Fig 3. Familywise distribution of bird diversity recorded during the study period.



Image 2. Pallas' Fish Eagle.



Image 6. Flock of Northern Pintail and Red-crested Pochard.



Image 3. Bar-headed Goose.



Image 7. Flock of Gulls.



Image 4. Black-necked Stork.

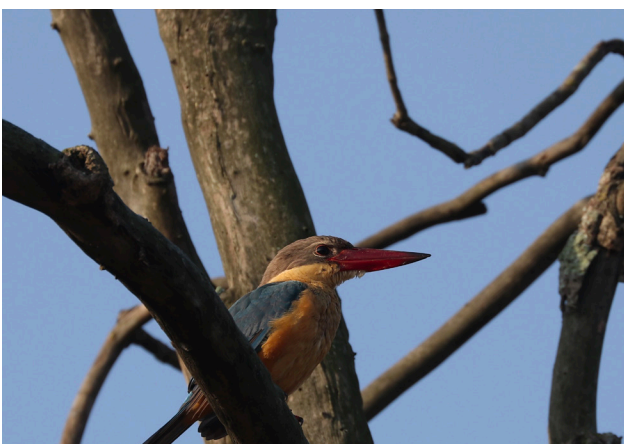


Image 5. Stork-billed Kingfisher.

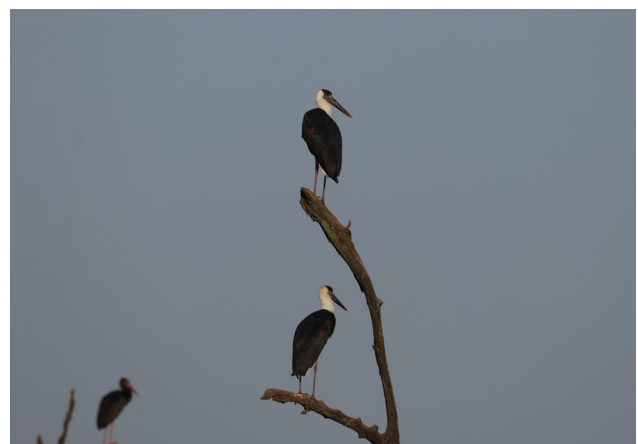


Image 8. Woolly-necked Stork and Black Stork.



Image 9. Eurasian Wryneck.

for bird survey. Line transects method was used for urban, suburban and forest habitats. A transect was one kilometer long and 20m wide on either side during the observation. Point count method was used for wetland bird survey (Bibby et al. 2000). Avifauna survey was done between 07.00–11.00 h and 15.30–19.30 h during April–September and between 08.00–11.00 h during October–March. The species diversity (familywise) indices were calculated by using Shannon-Weavers formula [ $H' = -\sum p_i (\ln p_i)$ ] (Shannon & Weaver 1949). We used a pair of Nikon 10x50 prismatic field binoculars, Canon SX 60 HS, Canon 80D cameras and field guides (Grimmett et al. 2001) for identification and counting of the birds.

We observed a total number of 226 avian species belonging to 61 families during the study period (Table 1). Among these, 182 are resident, 23 are winter visitors and 21 are resident migratory species as identified. The percentage of resident, winter visitor

and resident migratory avian species was found to be 81%, 10%, and 9%, respectively (Fig-2). The maximum number of species recorded from family Muscicapidae (21) followed by Accipitridae (16), Picidae (12) Columbidae (8) (Fig. 3) of which 57 are water bird species found in Haridwar. A total of 12 species fall under the various category of IUCN. The value of diversity index (familywise) was found to be 3.79 during the study period. The study area comes under the western Himalayan region which is also considered as one of the important bird areas (IBAs) Islam et al. 2004). The environmental factors of the area like vegetation composition and canopy are the vital factors that are to blame for the habitat selection choice of the environment and distribution, diversity and richness of the water bird species. Vegetation composition influences the selection of food resources that increase the abundance of the aquatic bird species within the space. The deeper water supports the density of some species especially

ducks and cormorants as they prefer deep open water bodies for hunting (Saini et al. 2017). It's been reported that the population of water residential and migrant birds have declined considerably (Saini et al. 2017). The presence of Bar-headed Goose *Anser indicus* (Plate-4) at Misserpur Ghat arrived in winter season from the central part of Asia, most of the water birds migrate by Central Asian migration route on Indian landmass thereby indicating that natural land is favorable for water migratory birds (Arya et al. 2019). Northern pintail (Image 6) is winter migrant in northern region of Indian subcontinent as reported earlier by (Bhatt et al. 2014). The presence of vulnerable species like Woolly-necked Stork *Ciconia episcopus* (Image 8), Palla's Fish Eagle *Haliaeetus leucoryphus* (Image 2) and threatened species like the Great Hornbill *Buceros bicornis*, Black-necked Stork *Ephippiorhynchus asiaticus* (Image 4), and Painted Stork *Mycteria leucocephala*. Haridwar indicates the want of conservation effort in this space for bird species.

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