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## COMMUNICATION

### AVITOURISM OPPORTUNITIES AS A CONTRIBUTION TO CONSERVATION AND RURAL LIVELIHOODS IN THE HINDU KUSH HIMALAYA - A FIELD PERSPECTIVE

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## AVITOURISM OPPORTUNITIES AS A CONTRIBUTION TO CONSERVATION AND RURAL LIVELIHOODS IN THE HINDU KUSH HIMALAYA - A FIELD PERSPECTIVE

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**Abstract:** The Hindu Kush Himalaya is a biodiversity hotspot subject to multiple anthropogenic stressors, including hydropower plants, pollution, deforestation and wildlife poaching, in addition to changing climate. Bird photography tourism, as a locally important element of avitourism, has the potential to integrate sustainable development and wildlife conservation. We conducted field surveys around the reaches of four Indian Himalayan rivers—the Kosi, western Ramganga, Khoh, and Song—outside of protected national parks (the Corbett and Rajaji tiger reserves) to ascertain the distribution of bird species along river corridors that could be sites of avitourism. Species richness along the surveyed reaches were: Kosi (79), western Ramganga (91), Khoh (52), and Song (79). This study contributes critical data to the existing baseline information on the avifaunal species of Uttarakhand. It further discusses the possibility of developing avitourism for knowledge generation on species distribution and innovative livelihood options for local communities in Uttarakhand, reinforcing local vested interest in bird conservation. The findings have generic applicability worldwide.

**Keywords:** Birds, community-led conservation, eco-tourism, India, Khoh, Kosi, Song, Uttarakhand, western Ramganga.

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Author contribution: NG designed the work, conducted the fieldwork, analysed the data, and wrote the paper. ME assisted with the writing of the paper. IK assisted with the images in the paper. VKB assisted with the data collection.

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## INTRODUCTION

Species conservation in the Hindu Kush Himalaya (HKH henceforth) has often focused on megafauna. The Bengal Tiger *Panthera tigris tigris*, Snow Leopard *Panthera uncia*, Indian Elephant *Elephas maximus indicus*, the Greater One-horned Rhinoceros *Rhinoceros unicornis*, and Red Panda *Ailurus fulgens* are afforded the highest judicial protection, and are the prime recipients of conservation grants. Very little current information is available regarding the distribution in the HKH of previously reported species of birds (based on observations in the wild, visual signs, discussion with communities, unconfirmed reports). It is, however, reasonable to infer that pressures arising from increasing anthropogenic stressors (e.g., hydropower plants, pollution, deforestation, poaching) and changing climatic variables continue to have potentially significant impacts on multiple avian species (INCCA 2010; Shrestha et al. 2015; Alfthan et al. 2018). It is, therefore, critical that information regarding the distribution of birds is made a priority as they play important and diverse roles in the structure, functions and ecosystem services of food webs (Sekercioglu et al. 2004).

Environmental indicators serve important roles in conservation responses and land-use management by constituting simplified summaries synthesising multiple datasets or specific pieces of information within complex systems (Jackson et al. 2000). Birds are perceived as useful environmental quality indicators owing to their conspicuousness and mobility, the scale at which they utilise landscapes, as well as their diversity, roles in food webs, integrated responses to multiple pressures, association with specific habitat types and public appeal (Gregory et al. 2004, 2005). Bird indicators, therefore, provide valuable tools for assessing ecosystem health including in wetland and freshwater systems. One such indicator has been developed for this purpose in Britain (Everard & Noble 2010).

Avitourism, where birdwatching is the primary motivation of a trip, has gained momentum as a niche of nature-based tourism products for birders, conservationists and photographers alike (Connell 2009; Cordell & Herbert 2002). This industry is experiencing a paradigm shift from historically localised birdwatching into a global market, in part due to the increasing affordability of travel (Steven et al. 2014). The avitourists are usually well-off and passionate people willing to travel greater distance just to see endemic and/or endangered species, a significant aspect of societal valuation of species diversity (Sekercioglu 2002).

Avitourism is consequently a rapidly expanding activity, especially in developing countries with high biodiversity. The passion and enthusiasm associated with this recreational pastime have ensured that birders travel to remote locations, bringing along with them livelihood opportunities for local people. There have been previous assessments on the potential development of avitourism globally (Steven et al. 2014). The potential impacts of birdwatching (Biggs et al. 2011; Puhakka et al. 2011), birdwatching destinations, birdwatching festivals, migration events, and their impacts on local people have been examined (Lawton 2009). The social perspective surrounding the activity (Cordell & Herbert 2002; Eubanks et al. 2004; Connell 2009), along with bird species fed artificially for tourism attraction (Jones 2011), have also been studied. As avitourism has huge potential to achieve win-win outcomes for local communities and the objectives of protected area managers, there is a need to establish locally specific interlinkages between birdwatching ecotourism, environmental conservation and economic co-benefits (Vas 2013).

The HKH is the world's most densely populated mountain range (Alfthan et al. 2018), but one that is subject to numerous anthropogenic threats. By the 2050s, temperatures across the region are projected to increase by about 1–2 °C, the monsoon is expected to become longer/more erratic, precipitation is projected to change by 5% on average, and the intensity of extreme rainfall events is likely to increase (Shrestha et al. 2015; Alfthan et al. 2018). These climatic factors are likely to have an adverse impact on the bird habitats across the region (Alfthan et al. 2018).

The HKH region is home to a rich assortment of avifaunal species, and many of these have established an important position in the psyche of local communities through cultural, traditional and religious associations (Singh et al. 2017). It is, therefore, important to involve the public, the private sector, and the government around common interests, which may enable co-creation of solutions to counteract the decline of bird populations, particularly for lesser known avian species (Hausmann et al. 2017; Watts 2018). Nonetheless, it is important to note that unsustainable development, unregulated tourism, and unnecessary feeding may have negative impacts on native bird species.

This study focuses on the current distribution of birds along four river corridors—the Kosi, western Ramganga (henceforth Ramganga River), Khoh, and Song—in Uttarakhand State of the Indian Himalayan region, focusing on river reaches outside protected

areas (i.e., the core areas of Corbett and Rajaji Tiger Reserves). It proceeds to discuss possible management responses to promote immediate protection and long-term conservation of birds in the region, including promotion of bird photography tourism as a potential livelihood option for local communities. Focus group discussions (FGDs) were undertaken to understand any ongoing avitourism efforts and livelihood benefits that occur here.

## METHODS

### Study area

The field survey of river corridor birds focused on the state of Uttarakhand (30.0668° N, 79.0193° E), lying within the western region of the Indian Himalayan biodiversity hotspot (Gupta et al. 2015). Key characteristics of the four surveyed rivers, described in greater detail by Gupta et al. (2015), are outlined in Table 1 and illustrated in Fig. 1.

Members of communities in this region that engage in aspects of ecotourism provide multiple services such as tour guides, accommodation and food, transportation, and other necessary infrastructure for incoming tourists (Nishikant Gupta, pers. obs. 2010–2019).

### Avifaunal survey

Field surveys were conducted by teams of three surveyors, travelling on foot along the banks of each of the four rivers to collect direct and indirect evidence of the presence of birds. Fieldwork was conducted pre- and post-monsoon, and in the winter months of 2018 and 2019. GPS locations of indirect and direct signs were recorded. Avian species were recorded at 20 independent sites using the line transect method (Chettri et al. 2005). Transect locations were selected based on the presence of bird signs (e.g., nesting sites, droppings). Surveyors walked in a transect parallel to the river, recording evidence of birds (seen by naked eye or with 10x50 binoculars or heard) in 500m sections. Each observation session lasted 60–90 minutes, each transect was surveyed three separate times, and the points travelled (and therefore sampled) were in a specific order, i.e., along the downstream of a particular river stretch. Where possible, birds were photographed. Standard published literature was used to identify bird species. Avifaunal surveys were limited by the dynamic and potentially hazardous nature of some study sites, and occurrence and detection of some bird species were constrained by season and time of the day due to variation in activity levels and behaviour among species (Bashir et al. 2012).

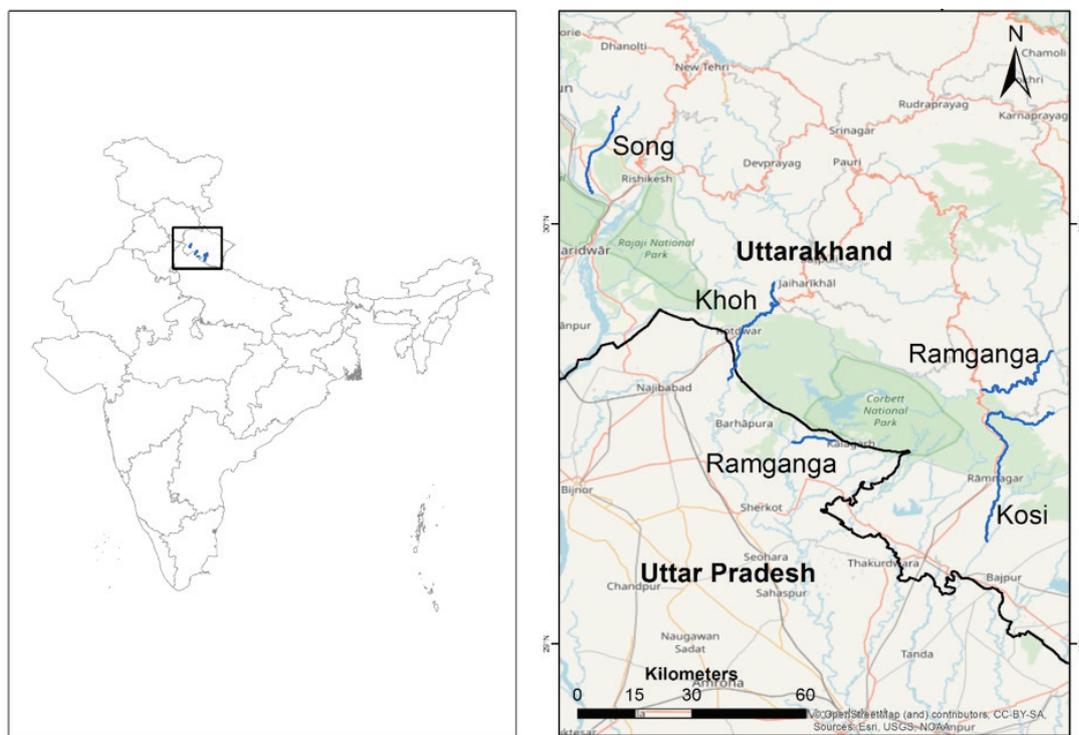


Figure 1. The study area and sampling stations. Each river stretch is labelled in blue, with each transect location spread across at every 500m.

It is important to note that the bird counts may be slightly different during this study, compared to the times that local avitourism operators would take birdwatchers out to look for birds. This could result in the authors missing some of the abundance and diversity of birds at peak dawn and evening hours as we avoided these hours for safety reasons.

**RESULTS**

The overall avian species richness from the four rivers was 136 (Table 2). Across the individual rivers, the species richness were as follows: Kosi = 79 species, western Ramganga = 91 species, Khoh = 52 species, and Song = 79 species. The data of avian species recorded (overall and from individual rivers) were visualised as a heat map, where the x-axis represented bird population trend, and the y-axis the IUCN Red List Status of Threatened Species. The bars represent the count

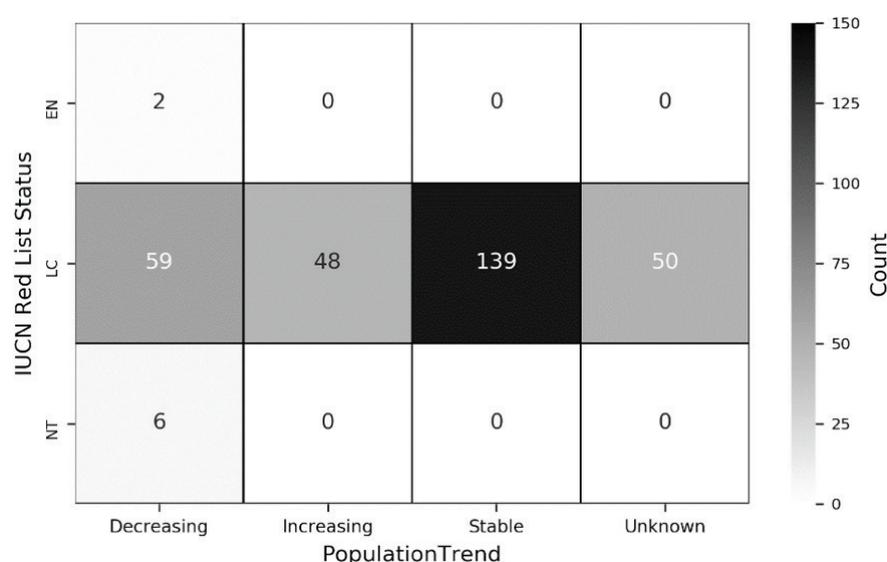
of IUCN Red List Status and corresponding population trend (Figures 2 and 3). Of the overall avian species richness (N=136), 89% were seen (detected visually from river banks) within navigable distances from the villages and tourist-access points, characteristics that could make them the most suitable for avitourism and more general ecotourism in the area. In addition, 75% of the species could be photographed by surveyors in this study, adding extra potential avitourism value.

**DISCUSSION**

Avitourism research is significantly skewed towards the northern hemisphere, and North America in particular, as bird-related activities have constituted significant leisure activities among North Americans over the past century (Connell 2009). Mexico and Colombia, which collectively play host to over 1,900 bird species, are the topmost destinations for US birdwatchers,

**Table 1. Key descriptors of the four surveyed rivers in Uttarakhand.**

River	Source and additional notes	Number of transect	Avian species richness (N)
Kosi	Budha Peenath Village in the Kausani area of Almora district, Uttarakhand. The Kosi is an important tributary of the Ramganga River	20	79
Western Ramganga	Shivalik Himalaya at Dudhatoli in Chamoli district, Uttarakhand. The Ramganga is an important tributary of the Ganges River	20	91
Khoh	Langur in Dwarikhal, Uttarakhand. The Khoh is a tributary of the Ramganga	20	52
Song	Spring-fed stream in the southern slopes of the Mussoorie ridge of the Himalayan range. The Song is a tributary of the Suswa River, which in turn is a tributary of the Ganges	20	79



**Figure 2. Avian species recorded from all the study sites (the x-axis represents the population trend, the y-axis the IUCN Red List Status, and the bars provide the IUCN Red List Status and their corresponding population trend).**

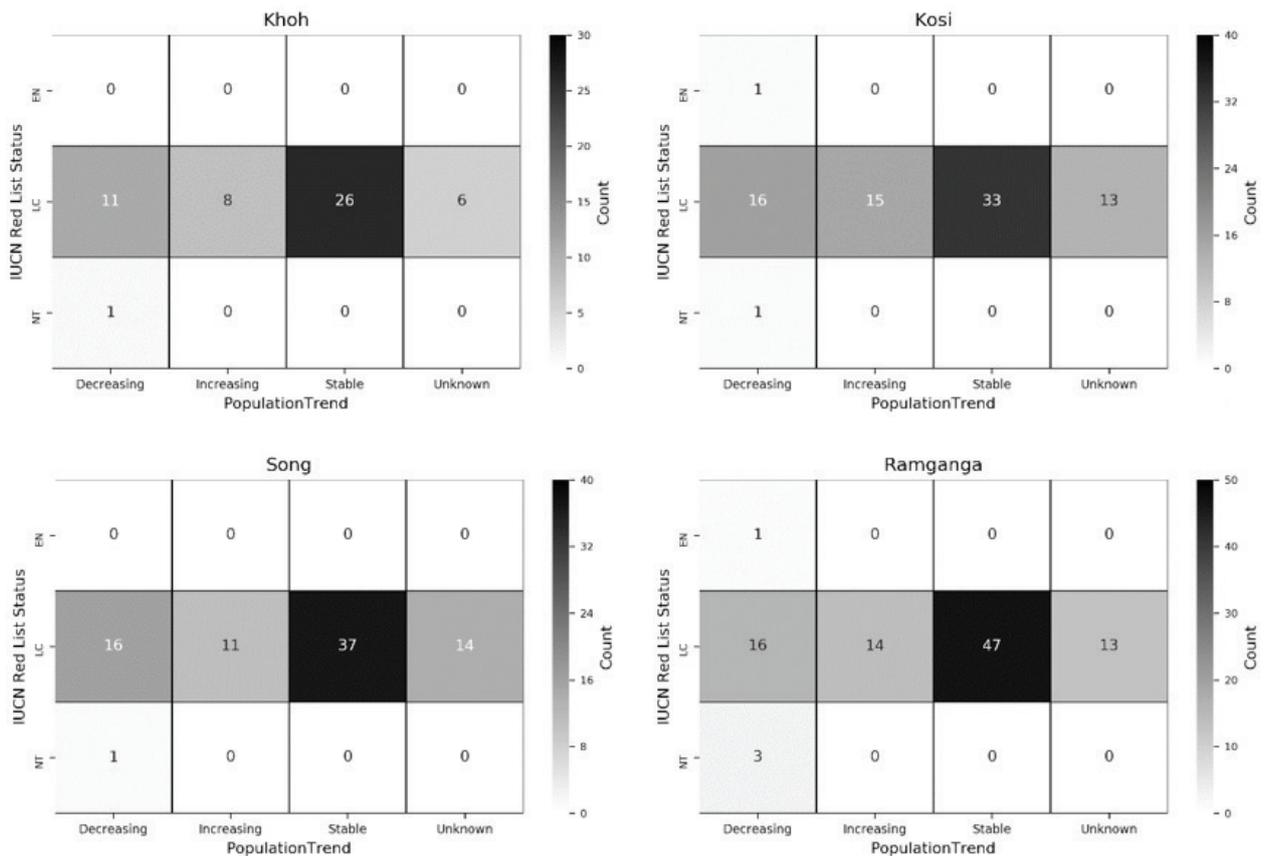


Figure 3. Avian species recorded from the individual rivers (the x-axis represents the population trend, the y-axis the IUCN Red List Status, and the bars provide the IUCN Red List Status and their corresponding population trend). The unit here is the number of species rather than count of individuals.

followed by Venezuela, Costa Rica and Panama (Maldonado et al. 2018). Many countries have thriving bird watching societies, which promote and sponsor trips to destinations where there is an abundance of bird life (Serkercioglu 2003). The socio-economic, ecological, gender and governance dimensions of the birdwatching tourism have been recorded previously (Callaghan et al. 2017). The values that people ascribe to rare or infrequently encountered species, however, have been studied to a lesser extent (Booth et al. 2011).

Avitourism is an important tool with the potential to influence the psyche of local, rural communities and individuals towards a bird species. And it is important that these local communities continue to sustainably work towards increasing the experience of tourists visiting the area. This is because what attracts the birders' 'gaze' and explains the rationale behind their long-distance travel decisions are abundant bird species and good ecological conditions. In addition, reasonable cost, good hospitality of local villagers, and easy approval procedures for entry into birdwatching areas are also important determinants.

Focus group discussions (FGDs) undertaken with village members (N=126), ornithologists (N=5), conservationists (N=10) and bird guides (N=15) in the surveyed areas of Uttarakhand (Nishikant Gupta, per. obs. 2019) revealed that a total of 76% of local households (N=156; 15–65 years; 125 males, 31 females) showed interest in participation in one or more forms of avitourism services if they strengthened livelihood opportunities (when asked regarding the potential applicability of avitourism in their area). Respondents were informed that it is essential to: (a) understand the ecological impacts of feeding to attract birds for tourists, (b) promote organic farming in order to minimise the use of pesticides and fertilisers, (c) regulate the tourist conduct, (d) enhance local environments, and (e) improve the services provided by homestay entrepreneurs (accommodation providers). Ninety-six percent of the respondents revealed that, if sustainably managed, the tourism revenue generated through this activity could protect critical species, economically help the local communities, and potentially lessen the outmigration of men from rural to urban areas seeking

**Table 2. Avian species recorded from all the study sites in alphabetical order.**

	Family	Order	Common name	Scientific name	IUCN Red List Status <sup>a</sup>	Population trend <sup>a</sup>
1	Cisticolidae	Passeriformes	Ashy Prinia	<i>Prinia socialis</i>	LC	Stable
2	Meropidae	Coraciiformes	Asian Green Bee-eater	<i>Merops orientalis</i>		Increasing
3	Ploceidae	Passeriformes	Baya Weaver	<i>Ploceus philippinus</i>		Stable
4	Pycnonotidae		Black Bulbul	<i>Hypsipetes leucocephalus</i>		
5	Timaliidae		Black-chinned Babbler	<i>Cyanoderma pyrrhops</i>		
6	Dicruridae		Black Drongo	<i>Dicrurus macrocercus</i>		Unknown
7	Accipitridae	Accipitriformes	Black Kite	<i>Milvus migrans</i>		
8	Paridae	Passeriformes	Black-lored Tit	<i>Machlolophus xanthogenys</i>		Stable
9	Muscicapidae		Black Redstart	<i>Phoenicurus ochruros</i>		Increasing
10	Accipitridae	Accipitriformes	Black-shouldered Kite	<i>Elanus caeruleus</i>		Stable
11	Recurvirostridae	Charadriiformes	Black-winged Stilt	<i>Himantopus himantopus</i>		Increasing
12	Muscicapidae	Passeriformes	Blue Rock-thrush	<i>Monticola solitarius</i>		Stable
13	Megalaimidae	Piciformes	Blue-throated Barbet	<i>Psilopogon asiaticus</i>		
14	Muscicapidae	Passeriformes	Blue-throated Blue-flycatcher	<i>Cyornis rubeculoides</i>		
15			Blue Whistling-thrush	<i>Myophonus caeruleus</i>		Unknown
16	Sturnidae		Brahminy Starling	<i>Sturnia pagodarum</i>		
17	Cinclidae		Brown Dipper	<i>Cinclus pallasi</i>		Stable
18	Strigidae	Strigiformes	Brown Fish-owl	<i>Ketupa zeylonensis</i>		Decreasing
19	Muscicapidae	Passeriformes	Brown Rockchat	<i>Oenanthe fusca</i>		Stable
20	Ardeidae	Pelecaniformes	Cattle Egret	<i>Bubulcus ibis</i>		Increasing
21	Accipitridae	Accipitriformes	Changeable Hawk-eagle	<i>Nisaetus cirrhatus</i>		Decreasing
22	Sittidae	Passeriformes	Chestnut-bellied Nuthatch	<i>Sitta cinnamoventris</i>		Unknown
23	Meropidae	Coraciiformes	Chestnut-headed Bee-eater	<i>Merops leschenaulti</i>		Increasing
24	Passeridae	Passeriformes	Chestnut-shouldered Bush-sparrow	<i>Gymnoris xanthocollis</i>		Stable
25	Sturnidae		Chestnut-tailed Starling	<i>Sturnia malabarica</i>		Unknown
26	Hirundinidae		Collared Sand Martin	<i>Riparia riparia</i>		Decreasing
27	Leiotrichidae		Common Babbler	<i>Argya caudata</i>		Stable
28	Upupidae	Bucerotiformes	Common Hoopoe	<i>Upupa epops</i>		Decreasing
29	Aegithinidae	Passeriformes	Common Iora	<i>Aegithina tiphia</i>		Unknown
30	Alcedinidae	Coraciiformes	Common Kingfisher	<i>Alcedo atthis</i>		
31	Sturnidae	Passeriformes	Common Myna	<i>Acridotheres tristis</i>		Increasing
32	Scolopacidae	Charadriiformes	Common Sandpiper	<i>Actitis hypoleucos</i>		Decreasing
33	Muscicapidae	Passeriformes	Common Stonechat	<i>Saxicola torquatus</i>		Stable
34	Cisticolidae		Common Tailorbird	<i>Orthotomus sutorius</i>		
35	Megalaimidae	Piciformes	Coppersmith Barbet	<i>Psilopogon haemacephalus</i>		Increasing
36	Emberizidae	Passeriformes	Crested Bunting	<i>Emberiza lathami</i>		Stable
37	Alcedinidae	Coraciiformes	Crested Kingfisher	<i>Megaceryle lugubris</i>		Decreasing
38	Accipitridae	Accipitriformes	Crested Serpent-eagle	<i>Spilornis cheela</i>		Stable
39	Hemiprocnidae	Caprimulgiformes	Crested Treeswift	<i>Hemiprocne coronata</i>		
40	Nectariniidae	Passeriformes	Crimson Sunbird	<i>Aethopyga siparaja</i>		
41	Columbidae	Columbiformes	Eastern Spotted Dove	<i>Spilopelia chinensis</i>		Increasing
42	Columbidae		Eurasian Collared-dove	<i>Streptopelia decaocto</i>		
43	Picidae	Piciformes	Fulvous-breasted Woodpecker	<i>Dendrocopos macei</i>		Stable

	Family	Order	Common name	Scientific name	IUCN Red List Status <sup>#</sup>	Population trend <sup>#</sup>
44	Megalaimidae		Great Barbet	<i>Psilopogon virens</i>		
45	Phalacrocoracidae	Suliformes	Great Cormorant	<i>Phalacrocorax carbo</i>		Increasing
46	Ardeidae	Pelecaniformes	Great Egret	<i>Ardea alba</i>		Unknown
47	Paridae	Passeriformes	Great Tit	<i>Parus major</i>		
48	Cuculidae	Cuculiformes	Greater Coucal	<i>Centropus sinensis</i>		Stable
49	Picidae	Piciformes	Greater Yellownappe	<i>Chrysophlegma flavinucha</i>		
50	Nectariniidae	Passeriformes	Green-tailed Sunbird	<i>Aethopyga nipalensis</i>		
51	Cisticolidae		Grey-breasted Prinia	<i>Prinia hodgsonii</i>		
52	Columbidae	Columbiformes	Grey-capped Emerald Dove	<i>Chalcophaps indica</i>		Decreasing
53	Picidae	Piciformes	Grey-capped Woodpecker	<i>Picoides canicapillus</i>		Stable
54			Grey-faced Woodpecker	<i>Picus canus</i>		Increasing
55	Stenostiridae	Passeriformes	Grey-headed Canary-flycatcher	<i>Culicicapa ceylonensis</i>		Stable
56	Timaliidae		Grey-hooded Babbler	<i>Cyanoderma bicolor</i>		Decreasing
57	Phylloscopidae		Grey-hooded Warbler	<i>Phylloscopus xanthoschistos</i>		Stable
58	Corvidae		Grey Treepie	<i>Dendrocitta formosae</i>		Decreasing
59	Motacillidae		Grey Wagtail	<i>Motacilla cinerea</i>		Stable
60	Pycnonotidae		Himalayan Bulbul	<i>Pycnonotus leucogenys</i>		Increasing
61	Corvidae		House Crow	<i>Corvus splendens</i>		Stable
62	Passeridae		House Sparrow	<i>Passer domesticus</i>		Decreasing
63	Phalacrocoracidae	Suliformes	Indian Cormorant	<i>Phalacrocorax fuscicollis</i>		Unknown
64	Muscicapidae	Passeriformes	Indian Robin	<i>Saxicoloides fulicatus</i>		Stable
65	Bucerotidae	Bucerotiformes	Indian Grey Hornbill	<i>Ocyroceros birostris</i>		
66	Monarchidae	Passeriformes	Indian Paradise-flycatcher	<i>Terpsiphone paradisi</i>		
67	Phasianidae	Galliformes	Indian Peafowl	<i>Pavo cristatus</i>		
68	Picidae	Piciformes	Indian Pygmy Woodpecker	<i>Picoides nanus</i>		Increasing
69	Ardeidae	Pelecaniformes	Indian Pond-heron	<i>Ardeola grayii</i>		Unknown
70	Coraciidae	Coraciiformes	Indian Roller	<i>Coracias benghalensis</i>		Increasing
71	Ardeidae	Pelecaniformes	Intermediate Egret	<i>Ardea intermedia</i>		Decreasing
72	Leiotrichidae	Passeriformes	Jungle Babbler	<i>Turdoides striata</i>		Stable
73	Sturnidae		Jungle Myna	<i>Acridotheres fuscus</i>		Decreasing
74	Strigidae	Strigiformes	Jungle Owlet	<i>Glauclidium radiatum</i>		Stable
75	Phasianidae	Galliformes	Kalij Pheasant	<i>Lophura leucomelanos</i>		Decreasing
76	Corvidae	Passeriformes	Large-billed Crow	<i>Corvus macrorhynchos</i>		Stable
77	Accipitridae	Accipitriformes	Lesser Fish-eagle	<i>Ichthyophaga humilis</i>	NT	Decreasing
78	Picidae	Piciformes	Lesser Yellownappe	<i>Picus chlorolophus</i>	LC	Stable
79	Megalaimidae		Lineated Barbet	<i>Psilopogon lineatus</i>		
80	Phalacrocoracidae	Suliformes	Little Cormorant	<i>Microcarbo niger</i>		Unknown
81	Ardeidae	Pelecaniformes	Little Egret	<i>Egretta garzetta</i>		Increasing
82	Campephagidae	Passeriformes	Long-tailed Minivet	<i>Pericrocotus ethologus</i>		Stable
83	Laniidae		Long-tailed Shrike	<i>Lanius schach</i>		Unknown
84	Accipitridae	Accipitriformes	Mountain Hawk-eagle	<i>Nisaetus nipalensis</i>		Decreasing
85	Hirundinidae	Passeriformes	Nepal House Martin	<i>Delichon nipalense</i>		Stable
86	Turdidae		Orange-headed Thrush	<i>Geokichla citrina</i>		Decreasing
87	Accipitridae	Accipitriformes	Oriental Honey-buzzard	<i>Pernis ptilorhynchus</i>		Stable
88	Muscicapidae	Passeriformes	Oriental Magpie-robin	<i>Copsychus saularis</i>		

	Family	Order	Common name	Scientific name	IUCN Red List Status <sup>#</sup>	Population trend <sup>#</sup>
89	Columbidae	Columbiformes	Oriental Turtle-dove	<i>Streptopelia orientalis</i>		
90	Zosteropidae	Passeriformes	Oriental White-eye	<i>Zosterops palpebrosus</i>		Decreasing
91	Accipitridae	Accipitriformes	Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>	EN	
92	Muscicapidae	Passeriformes	Pied Bushchat	<i>Saxicola caprata</i>	LC	Stable
93	Alcedinidae	Coraciiformes	Pied Kingfisher	<i>Ceryle rudis</i>		Unknown
94	Muscicapidae	Passeriformes	Plumbeous Water-redstart	<i>Phoenicurus fuliginosus</i>		Stable
95	Psittacidae	Psittaciformes	Plum-headed Parakeet	<i>Psittacula cyanocephala</i>		Decreasing
96	Nectariniidae	Passeriformes	Purple Sunbird	<i>Cinnyris asiaticus</i>		Stable
97	Corvidae		Red-billed Blue Magpie	<i>Urocissa erythroryncha</i>		Increasing
98	Leiostrichidae	Passeriformes	Red-billed Leiostrich	<i>Leiostrichus lutea</i>		Decreasing
99	Psittacidae	Psittaciformes	Red-breasted Parakeet	<i>Psittacula alexandri</i>	NT	
100	Phasianidae	Galliformes	Red Junglefowl	<i>Gallus gallus</i>	LC	
101	Hirundinidae	Passeriformes	Red-rumped Swallow	<i>Cecropis daurica</i>		Stable
102	Pycnonotidae		Red-vented Bulbul	<i>Pycnonotus cafer</i>		Increasing
103	Charadriidae	Charadriiformes	Red-wattled Lapwing	<i>Vanellus indicus</i>		Unknown
104	Pycnonotidae	Passeriformes	Red-whiskered Bulbul	<i>Pycnonotus jocosus</i>		Decreasing
105	Charadriidae	Charadriiformes	River Lapwing	<i>Vanellus duvaucelii</i>	NT	
106	Columbidae	Columbiformes	Rock Dove	<i>Columba livia</i>	LC	
107	Sturnidae	Passeriformes	Rosy Starling	<i>Pastor roseus</i>		Unknown
108	Muscicapidae		Rufous-bellied Niltava	<i>Niltava sundara</i>		Stable
109	Leiostrichidae		Rufous Sibia	<i>Heterophasia capistrata</i>		Unknown
110	Anatidae	Anseriformes	Ruddy Shelduck	<i>Tadorna ferruginea</i>		
111	Corvidae	Passeriformes	Rufous Treepie	<i>Dendrocitta vagabunda</i>		Stable
112	Passeridae		Russet Sparrow	<i>Passer cinnamomeus</i>		
113	Timaliidae		Rusty-cheeked Scimitar-babbler	<i>Erythrogonys erythrogonys</i>		
114	Caprimulgidae	Caprimulgiformes	Savanna Nightjar	<i>Caprimulgus affinis</i>		
115	Accipitridae	Accipitriformes	Shikra	<i>Accipiter badius</i>		
116	Muscicapidae	Passeriformes	Slaty-blue Flycatcher	<i>Ficedula tricolor</i>		
117	Psittacidae	Psittaciformes	Slaty-headed Parakeet	<i>Psittacula himalayana</i>		
118	Dicruridae	Passeriformes	Spangled Drongo	<i>Dicrurus bracteatus</i>		
119	Muscicapidae		Spotted Forktail	<i>Enicurus maculatus</i>		
120	Accipitridae	Accipitriformes	Steppe Eagle	<i>Aquila nipalensis</i>	EN	Decreasing
121	Ardeidae	Pelecaniformes	Striated Heron	<i>Butorides striata</i>	LC	
122	Leiostrichidae	Passeriformes	Striated Laughingthrush	<i>Grammatoptila striata</i>		
123	Accipitridae	Accipitriformes	Tawny Eagle	<i>Aquila rapax</i>		
124	Strigidae	Strigiformes	Tawny Fish-owl	<i>Ketupa flavipes</i>		Stable
125	Sittidae	Passeriformes	Velvet-fronted Nuthatch	<i>Sitta frontalis</i>		
126	Columbidae	Columbiformes	Western Spotted Dove	<i>Spilopelia suratensis</i>		Increasing
127	Alcedinidae	Coraciiformes	White-breasted Kingfisher	<i>Halcyon smyrnensis</i>		
128	Rallidae	Gruiformes	White-breasted Waterhen	<i>Amaurornis phoenicurus</i>		Unknown
129	Motacillidae	Passeriformes	White-browed Wagtail	<i>Motacilla maderaspatensis</i>		Stable
130	Muscicapidae		White-capped Water-redstart	<i>Phoenicurus leucocephalus</i>		
131	Leiostrichidae		White-crested Laughingthrush	<i>Garrulax leucolophus</i>		Decreasing
132	Rhipiduridae		White-throated Fantail	<i>Rhipidura albicollis</i>		Stable

	Family	Order	Common name	Scientific name	IUCN Red List Status <sup>#</sup>	Population trend <sup>#</sup>
133	Tyrannidae		White-throated Flycatcher	<i>Empidonax albigularis</i>		
134	Alcedinidae	Coraciiformes	White-throated Kingfisher	<i>Halcyon smyrnensis</i>		Increasing
135	Sylviidae	Passeriformes	Yellow-eyed Babbler	<i>Chrysomma sinense</i>		Stable
136	Columbidae	Columbiformes	Yellow-footed Green-pigeon	<i>Treron phoenicopterus</i>		Increasing

<sup>#</sup>The IUCN Red List of Threatened Species 2019 | LC—Least Concern | NT—Near Threatened | EN—Endangered.

better employment opportunities (see Everard et al. 2019 for discussion of outmigration pressures in the Indian Himalaya).

Avitourism can be a cost-effective way to simultaneously create jobs whilst delivering conservation and human development benefits (Biggs et al. 2011), as birdwatchers are willing to travel to remote and less-developed locations, providing livelihood opportunities to areas that hold unique or locally characteristic bird resources. Increasing the number of tourists and the socio-economic and ecological benefits they create also raise associated ecological challenges that will require sensitive management. It is also important to ensure that benefits accrue to local communities in addition to tour operators, if incentives for local conservation action are to be guaranteed (Everard & Kataria 2011). A comprehensive management plan (CMP) including avitourism, with support from local government for developing more scientific and sustainable approaches will become essential in the coming years.

## CONCLUSION

One of the key highlights of this work was that it was undertaken outside of the two critical protected areas of the region: Corbett and Rajaji tiger reserves (Figure 1). Avitourism performed outside of protected areas has the potential to assist in protecting bird habitats that are not subject to such a high level of statutory protection, and spreading societal benefits and tourism pressures including reducing disturbance to threatened species within the protected areas (Basnet et al. 2019). Such supportive benefits have also been previously reported from southern Poland, where riverine habitats constitute biodiversity hotspots for migratory birds (Figarski & Kajtoch 2015). It is important to note that birdwatching tourism is dependent upon the diversity and visibility of species in the target destination, with sightings of migratory birds, songbirds and birds of prey also in popular demand from avitourists (Maldonado et al. 2018). This fundamental requirement is compatible

with conservation goals. Birdwatching activities at the study sites can not only boost the economic potential of the local community, but also help in the gathering of information on little known/Data Deficient species. Avitourism can, thus, make a significant contribution to the growing need for knowledge-gathering to support the conservation of species other than those with specific conservation designations or in formally protected areas (Whitelaw et al. 2014).

## REFERENCES

- Alfthan, B., N. Gupta, H.L. Gjerdi, T. Schoolmeester, M. Andresen, M. Jurek & N.K. Agrawal (2018). Outlook on climate change adaptation in the Hindu Kush Himalaya. Mountain Adaptation Outlook Series. United Nations Environment Programme, GRID-Arendal and the International Centre for Integrated Mountain Development: Vienna, Arendal and Kathmandu, 96pp.
- Bashir, T., S.K. Behera, A. Khan & P. Gautam (2012). An inventory of mammals, birds and reptiles along a section of the river and banks of upper Ganges, India. *Journal of Threatened Taxa* 4(9): 2900–2910. <https://doi.org/10.11609/JoTT.o2692.2900-10>
- Basnet, D., P. Kandel, N. Chettri, Y. Yang, M.S. Lodhi, N.Z. Htun, K. Uddin & E. Sharma (2019). Biodiversity research trends and gaps from the confluence of three global biodiversity hotspots in the far-eastern Himalaya. *International Journal of Ecology* 2019(1323419): 1–14. <https://doi.org/10.1155/2019/1323419>
- Biggs, D., J. Turpie, C. Fabricius & A. Spenceley (2011). The value of avitourism for conservation and job creation – an analysis from South Africa. *Conservation and Society* 9: 80–90.
- Booth, J.E., K.J. Gaston, K.L. Evans & P.R. Armsworth (2011). The value of species rarity in biodiversity recreation: A birdwatching example. *Biological Conservation* 144: 2728–2732.
- Callaghan, C.T., M. Slater, R.E. Major, M. Morrison, J.M. Martin & R.T. Kingsford (2017). Travelling birds generate eco-travellers: The economic potential of vagrant birdwatching. *Human Dimensions of Wildlife* 23(1): 71–82.
- Chettri, N., D.C. Deb, E. Sharma & R. Jackson (2005). The relationship between bird communities and habitat. *Mountain Research and Development* 25(3): 235–43.
- Connell, J. (2009). Birdwatching, twitching and tourism: towards an Australian perspective. *Australian Geographer* 40: 203–217.
- Cordell, H. & N. Herbert (2002). The popularity of birding is still growing. *Birding* 34: 54–61.
- Eubanks, T.L., J.R. Stoll & R.B. Ditton (2004). Understanding the diversity of eight birder sub populations: socio-demographic characteristics, motivations, expenditures and net benefits. *Journal of Ecotourism* 3(3): 151–172.
- Everard, M. & D. Noble (2010). The development of bird indicators for British fresh waters and wetlands. *Aquatic Conservation: Marine and Freshwater Ecosystems* 20: S117–S124.

- Everard, M. & G. Kataria (2011). Recreational angling markets to advance the conservation of a reach of the western Ramganga River. *Aquatic Conservation* 21(1): 101–108.
- Everard, M., N. Gupta, C.A. Scott, P.C. Tiwari, B. Joshi, G. Kataria & S. Kumar (2019). Assessing livelihood-ecosystem interdependencies and natural resource governance in Indian villages in the middle Himalayas. *Regional Environmental Change* 19: 165–177.
- Figarski, T. & L. Kajtoch (2015). Alterations of riverine ecosystems adversely affect bird assemblages. *Hydrobiologia* 744: 287–296.
- Gregory, R.D., D. Noble & J. Custance (2004). The state of play of farmland birds: population trends and conservation status of lowland farmland birds in the United Kingdom. *Ibis* 146: 1–13.
- Gregory, R.D., A. van-Strien, P. Vorisek, A.W. Gmelig Meyling, D.G. Noble, R.P.B. Foppen & D.W. Gibbons (2005). Developing indicators for European birds. *Philosophical Transactions of the Royal Society B* 360: 269–288.
- Hausmann, A., T. Toivonen, V. Heikinheimo, H. Tenkanen, R. Slotow & E. Di Minin (2017). Social media reveal that charismatic species are not the main attractor of ecotourists to sub-Saharan protected areas. *Scientific Reports* 7: 763.
- ICIMOD (2019). Regional workshop on developing birdwatching tourism in Baihualing, Yunnan, China. ICIMOD Workshop Report 2019. ICIMOD, Kathmandu, 32pp.
- INCCA (2010). Indian Network for Climate Change Assessment. Ministry of Environment & Forests, Government of India. Climate Change and India: a 4x4 assessment. A sectoral and regional analysis for 2030s, 164pp.
- Jackson, L.E., J.C. Kurtz & W.S. Fisher (2000). Evaluation Guidelines for Ecological Indicators. Environmental Protection Agency: Washington DC, Report No. EPA/620/R-99/0005.
- Jones, D. (2011). An appetite for connection: why we need to understand the effect and value of feeding wild birds. *Emu* 111(2): i–vii.
- Lawton, L.J. (2009). Birding festivals, sustainability, and ecotourism: an ambiguous relationship. *Journal of Travel Research* 48: 259–267.
- Maldonado, J.H., R.D.P. Moreno-Sanchez, S. Espinoza, A. Bruner & J.G. Myers (2018). Peace is much more than doves: The economic benefits of bird-based tourism as a result of the peace treaty in Colombia. *World Development* 106: 78–86.
- Puhakka, L., M. Salo & I.E. Sääksjärvi (2011). Bird diversity, birdwatching tourism and conservation in Peru: a geographic analysis. *PLoS ONE* 6(11): e26786.
- Sekercioglu, C. (2002). Impacts of birdwatching on human and avian communities. *Environmental Conservation* 29(3): 282–289.
- Şekercioglu, C.S., G.C. Daily & P.R. Ehrlich (2004). Ecosystem consequences of bird declines. *Proceedings of the National Academy of Sciences of the United States of America* 101: 18042–18047. <https://doi.org/10.1073/pnas.0408049101>
- Shrestha, A.B., N.K. Agarwal, B. Alifthan, S.R. Bajracharya, J. Marechal & B. van Oort (Eds). (2015). The Himalayan Climate and Water Atlas: Impact of climate change on water resources in five of Asia's major river basins. ICIMOD, GRID-Arendal and CICERO. 1–96.
- Singh, S., M. Youssouf, Z.A. Malik & R.W. Bussmann (2017). Sacred groves: myths, beliefs, and biodiversity conservation: a case study from western Himalaya, India. *International Journal of Ecology* 2017(3828609): 1–12.
- Steven, R., C. Morrison & J.G. Castley (2014). Birdwatching and avitourism: a global review of research into its participant markets, distribution and impacts, highlighting future research priorities to inform sustainable avitourism management. *Journal of Sustainable Tourism* 23: 1257–1276.
- Vas, K. (2013). Birding trails as sustainable tourism development. *International Journal of Sustainable Development* 6(3): 23–34.
- Whitelaw, P.A., B.E.M. King & D. Tolkach (2014). Protected areas, conservation and tourism—financing the sustainable dream. *Journal of Sustainable Tourism* 22(4): 584–603.
- Watts, J. (2018). Red list research finds 26,000 global species under extinction threat. *The Guardian* 05 July 2018. Available online at <https://www.theguardian.com/environment/2018/jul/05/red-list-research-finds-26000-species-under-extinction-threat>. Downloaded on 20 June 2018.





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