

Birds and Mammals of the Wakha Valley in Northern India

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Abstract

Ladakh in northern India harbours a diverse assemblage of birds and mammals. The species in the region show close affinity with the Palaearctic bio-geographic realm. We conducted a survey on mammals and birds in the Wakha Valley of Kargil district in Ladakh in 2013. This area remains virtually unknown in terms of its biodiversity. During the survey, we recorded mammalian herbivores like the Asiatic ibex *Capra ibex siberica*, Ladakh urial *Ovis vignei vignei* and long-tailed marmot *Marmota caudata*. Mammalian carnivores included the charismatic snow leopard *Panthera uncia*, Tibetan wolf *Canis lupus chanco*, Himalayan brown bear *Ursus arctos isabellinus* and red fox *Vulpes v. montana*. Avifauna comprised 45 species belonging to 19 families and five orders. Most of the bird species were of the order Passeriformes (36 species). Forty nine percent of the species were resident, while the rest were migratory that visit the area in summer as well as in winter. Bird species were mostly observed in riverine habitats. This is the first documentation of the diversity of birds and mammals in the Wakha valley of Ladakh.

Keywords: Birds; Mammals; Kargil; Ladakh; Trans-Himalaya

Introduction

Ladakh, spanning over an area of about 85,000 km² lies in the rain shadow of the Greater Himalaya. Due to its location at the boundary between two bio-geographic realms, it harbours a diverse assemblage of birds and mammals [1]. Mammalian fauna comprises 34 species which include eight wild ungulates and twelve carnivores [2-3]. Over 320 species of birds have been reported from the region [2,4,5].

Ladakh was an important hunting area for the British officials in the 20th Century, and anecdotal and

preliminary information on mammals of the region can be found in the diaries of many British hunters [6]. However, scientific investigation on mammals began only in the 1970s [7], and more detailed researches on the taxon were conducted [3,8,9] followed by species specific surveys to know the status and distribution of mammals such as Ladakh urial [10], Tibetan gazelle [11,12], Tibetan argali [13], and the snow leopard [14,15].

Early expeditions to study bird species of Ladakh were initiated in 1859(16). Thereafter, birds were studied by several researchers [17-19]. After the Independence of India, Ladakh remained closed for western explorers till

late 1970. Holmes visited Ladakh in 1986 to study the distribution of birds in the Suru Valley, and then many more followed suit [4,5,20-22].

Most of the studies on birds and mammals in Ladakh were carried out in the eastern part, and the Kargil area remained virtually unexplored. Only a few studies on birds and mammals in this area [21-24] were carried out. Recognizing this dearth of information, we conducted a survey in the Wakha valley of Kargil to document the birds and mammals of the region.

Study Area

Wakha Valley lies in the Kargil district of western Ladakh. Located at a distance of 47 km from the Kargil town, it has a human population of about 10,000 individuals. The valley is characterized by rugged terrain with altitude ranging from 3200m to 4600 m asl. Precipitation is generally in the form of snowfall during winter. Temperature in the valley plummets to -37°C in winter and surges upto 34°C in summer.

Vegetation in the region is characterized by sub-alpine meadow [25]. Primary productivity is low, and the area is virtually devoid of forest cover except for isolated patches of junipers and planted varieties of poplar and willow along major water courses [9]. Tree species such as willow *Salix* spp., Juniper *Juniperus semiglobosa* and *Beluta utilis* are confined to riparian areas [25].

People are dependent on agriculture and livestock farming for livelihood. Water for irrigation, drinking and livestock is sourced from Wakha River, which originates from the Kanji glacier. Agricultural season starts in May and ends in September. Barley and wheat, the staple crops of the region are cultivated during this short growth season. Sheep, goat, yak, cow and donkey are the main livestock types reared by farmers.

Methods

Data on mammals were collected in February and March, while data on birds were collected in April and May, 2013. We stratified the valley into five habitat types' namely riverine, agricultural, alpine meadows, steppe

vegetation and barren areas. Riverine areas included areas along river and streams with willow and poplar plantation whereas alpine meadows were characterised by gentle slopes with forb vegetation. Steppe vegetation areas are habitats with *Artemesia* spp. and *Tanacetum* spp. as dominant species.

For the mammals, we scanned the area from vantage points. Equal amount of time was spent in each habitat type. Stratification was necessary as the area has a mosaic of different habitat types. We relied on direct sightings in case of mammalian herbivores, and on signs in case of carnivorous species. Whenever animals were sighted, we recorded the GPS coordinates, altitude and slope angle of their locations. In case of the ungulates, we also recorded the number of individuals in a group, age and sex composition. The age and sex of the animals were determined through observing body size, distinct markings, and horn size [2,7].

To observe birds we walked along the river bank with willow and juniper trees, alpine meadows and trails. We stopped at every 100 meter and spent 10 minutes scanning the trees and vegetated slopes for birds. Whenever a bird was located, we noted down the species name, number of individuals, habitat type and GPS coordinates. We walked in the morning between 0600 and 0900 hrs and in the evening between 1600 and 1830 hrs. Birds were identified using the pocket guide to the birds of the Indian subcontinent [26]. Since no animal was handled during the study we did not need ethical clearance.

Results

Mammals

A total of 8 mammalian species were recorded in the Wakha Valley in an area ranging in altitude from 3200 to 4500 m asl. We counted a total of 93 individuals of Asiatic ibex in 13 groups and 115 Ladakh urial in three groups. We also observed 10 long-tailed marmots, 3 cape hare along the trails (Table 1). We did not observe any large predator except 8 red foxes. We however observed a lot of signs of the Himalayan brown bear (24 signs), Tibetan wolf (18) and snow leopard (10).

Species	Individuals	Groups	Mean group size	Adult Male	Adult Female	Sub-adult
Asiatic ibex	93	13	7	41	33	19
Ladakh urial	115	3	39	17	46	52

Table 1: Wild ungulates observed in the Wakha Valley, Kargil.

Ladakh urials were found in undulating areas where slope angle was less than 30 degrees whereas ibexes were seen in areas with broken and rugged terrains with more than 30 degrees slope angle. Marmots were mostly observed in alpine meadows (Figure 1). The signs of snow leopard were found mostly along valley bottoms and

ridgelines in riverine, alpine meadows and steppe vegetation areas. Brown bear signs were concentrated in riverine and rocky habitats whereas red fox and wolf signs were encountered mostly in alpine meadows and steppe vegetation areas (Figure 2).

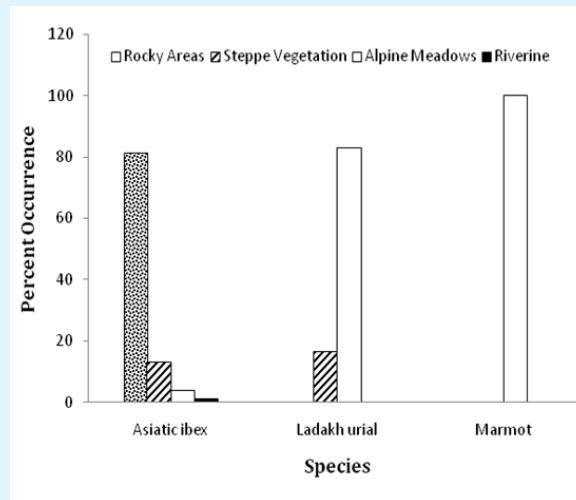


Figure 1: Percent occurrence of herbivore species in different habitat types in the Wakha Valley, Kargil.

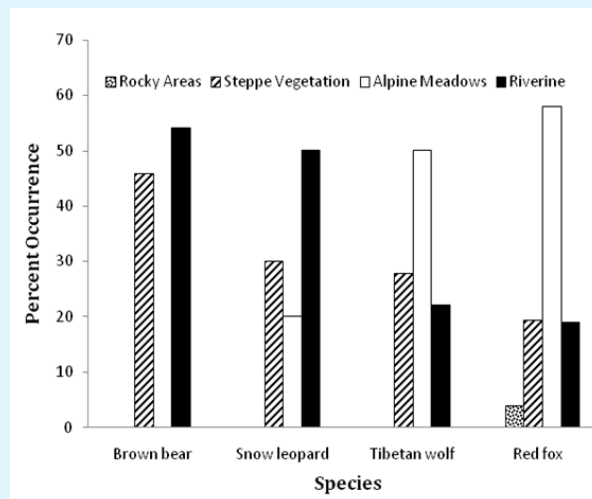


Figure 2: Percent occurrence of carnivore species in different habitat types in the Wakha Valley, Kargil.

Birds

A total of 45 bird species belonging to five orders and 19 families were recorded in the Wakha Valley (Table 2). This represented 17% of the total birds found in Ladakh.

Of the birds recorded, 49% were resident while 47% were summer visitors, 2% winter visitors and 2% were passage migrants. The Passeriformes represented by 36 species predominated the birds recorded (Table 3).

Order	Family	Species	Resident	Summer Visitor	Winter Visitor	Passage Migrant
Bucerotiformes	1	1	0	1	0	0
Columbiformes	1	5	4	1	0	0
Falconiformes	1	1	0	1	0	0
Galliformes	1	2	2	0	0	0
Passeriformes	15	36	16	18	1	1
Total	19	45	22	21	1	1
Percentage			49	47	2	2

Table 2: Birds of different species recorded during the survey in the Wakha Valley, Kargil.

S. No.	Common Name	Scientific Name	Family	Order	Status
1	Black-billed Magpie	<i>Pica pica</i> (Linnaeus, 1758)	Corvidae	Passeriformes	R
2	Black Redstart	<i>Phoenicurus ochruros</i> (S. G. Gmelin, 1774)	Muscicapidae	Passeriformes	SV
3	Blue Rock Thrush	<i>Monticola solitaries</i> (Linnaeus, 1758)	Muscicapidae	Passeriformes	SV
4	Blue Throat	<i>Luscinia svecica</i> (Linnaeus, 1758)	Muscicapidae	Passeriformes	SV
5	Blue Whistling Thrush	<i>Myophonus caeruleus</i> (Scopoli, 1786)	Muscicapidae	Passeriformes	R
6	Brown Accentor	<i>Prunella fulvescens</i> (Severtsov, 1873)	Prunellidae	Passeriformes	R
7	Brown Dipper	<i>Cinclus pallasii</i> (Temminck, 1820)	Cinclidae	Passeriformes	R
8	Chukar Partridge	<i>Alectoris chukar</i> (J.E. Gray, 1830)	Phasianidae	Galliformes	R
9	Citrine Wagtail	<i>Motacilla citreola</i> (Pallas, 1776)	Motacillidae	Passeriformes	SV
10	Common Kestrel	<i>Falco tinnunculus</i> (Linnaeus, 1758)	Falconidae	Falconiformes	SV
11	Common Raven	<i>Corvus corax</i> (Linnaeus, 1758)	Corvidae	Passeriformes	R
12	Common Rosefinch	<i>Erythrura erythrura</i> (Pallas, 1770)	Frangillidae	Passeriformes	SV
13	Common Starling	<i>Sturnus vulgaris</i> (Linnaeus, 1758)	Sturnidae	Passeriformes	R
14	Desert Wheatear	<i>Oenanthe deserti</i> (Temminck, 1825)	Muscicapidae	Passeriformes	SV
15	Eurasian Collared Dove	<i>Streptopelia decaocto</i> (Frivaldszky, 1838)	Columbidae	Columbiformes	SV
16	Eurasian Golden Oriole	<i>Oriolus oriolus</i> (Linnaeus, 1758)	Oriolidae	Passeriformes	SV
17	Eurasian Jackdaw	<i>Corvus monedula</i> (Linnaeus, 1758)	Corvidae	Passeriformes	WV
18	European Goldfinch	<i>Carduelis carduelis</i> (Linnaeus, 1758)	Frangillidae	Passeriformes	SV
19	Fire-fronted Serin	<i>Serinus pusillus</i> (Pallas, 1811)	Fringillidae	Passeriformes	R
20	Great Rosefinch	<i>Carpodacus rubicilla</i> (Guldenstadt, 1775)	Frangillidae	Passeriformes	SV
21	Great Tit	<i>Parus cinereus</i> (Vieillot, 1818)	Paridae	Passeriformes	R
22	Grey Wagtail	<i>Motacilla cinerea</i> (Tunstall, 1771)	Motacillidae	Passeriformes	R
23	Hill Pigeon	<i>Columba rupestris</i> (Pallas, 1811)	Columbidae	Columbiformes	R
24	Himalayan Snowcock	<i>Tetraogallus himalayensis</i> (G. R. Gray, 1843)	Phasianidae	Galliformes	R
25	Common Hoopoe	<i>Upupa epops</i> (Linnaeus, 1758)	Upupidae	Bucerotiformes	SV
26	Horned Lark	<i>Eremophila alpestris</i> (Linnaeus, 1758)	Alaudidae	Passeriformes	R
27	House Sparrow	<i>Passer domesticus</i> (Linnaeus, 1758)	Passeridae	Passeriformes	SV
28	Kashmir Chiffchaff	<i>Phylloscopus sindianus</i> (W. E. Brooks, 1880)	Phylloscopidae	Passeriformes	SV
29	Large-billed Crow	<i>Corvus macrorhynchos</i> (Wagler, 1827)	Corvidae	Passeriformes	R
30	Long-tailed Shrike	<i>Lanius schach</i> (Linnaeus, 1758)	Laniidae	Passeriformes	SV
31	Oriental Turtle Dove	<i>Streptopelia orientalis</i> (Latham, 1790)	Columbidae	Columbiformes	R
32	Pied Wheatear	<i>Oenanthe pleschanka</i> (Lepechin, 1770)	Muscicapidae	Passeriformes	PM
33	Red-billed Chough	<i>Pyrrhocorax pyrrhocorax</i> (Linnaeus, 1758)	Corvidae	Passeriformes	R
34	Robin Accentor	<i>Prunella rubeculoides</i> (F. Moore, 1854)	Prunellidae	Passeriformes	R
35	Rock Bunting	<i>Emberiza cia</i> (Linnaeus, 1766)	Emberizidae	Passeriformes	SV
36	Rock Pigeon	<i>Columba livia</i> (J.F. Gmelin, 1789)	Columbidae	Columbiformes	R
37	Rufous-naped Tit	<i>Periparus rufonuchalis</i> (Blyth, 1849)	Paridae	Passeriformes	SV
38	Snow Pigeon	<i>Columba leuconota</i> (Vigors, 1831)	Columbidae	Columbiformes	R
39	Tibetan Snowfinch	<i>Montifringilla adamsi</i> (Adams, 1859)	Passeridae	Passeriformes	SV

40	Wallcreeper	<i>Tichodroma muraria</i> (Linnaeus, 1766)	Sittidae	Passeriformes	R
41	White Wagtail	<i>Motacilla alba</i> (Linnaeus, 1758)	Motacillidae	Passeriformes	SV
42	White-winged Redstart	<i>Phoenicurus erythrogastrus</i> (Guldenstadt, 1775)	Muscicapidae	Passeriformes	R
43	White-capped Water Redstart	<i>Chaimarrornis leucocephalus</i> (Vigors, 1831)	Muscicapidae	Passeriformes	SV
44	Yellow-billed Chough	<i>Pyrrhocorax graculus</i> (Linnaeus, 1766)	Corvidae	Passeriformes	R
45	Yellow Wagtail	<i>Motacilla flava</i> (Linnaeus, 1758)	Motacillidae	Passeriformes	SV

Table 3: Birds observed during the survey in the Wakha Valley, Kargil, Ladakh.

Passeriformes were recorded in all five habitat types whereas falconiformes were recorded in only two habitat types: steppe and riverine areas (Figure 3). Maximum bird species were however observed in the riverine and steppe vegetation. People reported sighting of Black-necked Crane in the valley some 20 years ago. This could be true, as people could identify the species when a

picture of the bird was shown to them. The people said that the pond where they had observed the crane has been subsumed by agricultural activities. Additionally they reported decrease in sightings of Passeriformes such as House Sparrow, Rose Finch, Redstart and Gold Finch to mention a few.

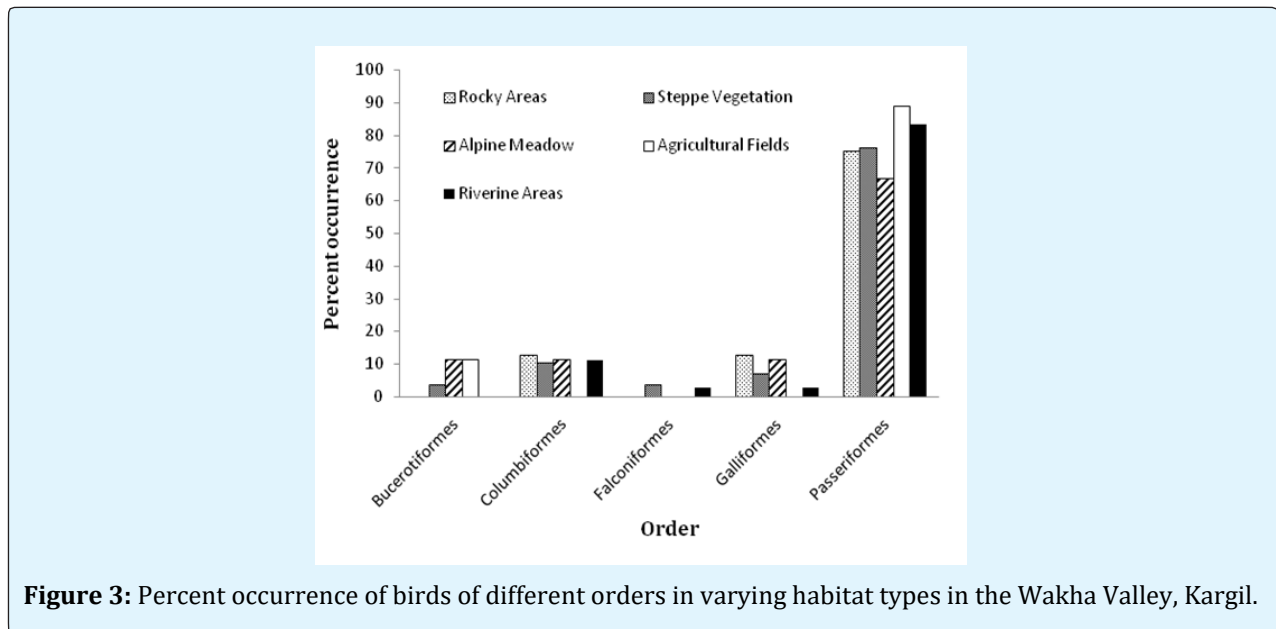


Figure 3: Percent occurrence of birds of different orders in varying habitat types in the Wakha Valley, Kargil.

Discussion

We recorded 12 species of wild mammals in the Wakha Valley. Ladakh urial and Asiatic ibex were the most prominent species observed. The ibex was observed in steeper areas with slopes steeper than 30 degrees whereas urial occurred in gentler areas with slope angle of < 30 degrees [10,27]. Asiatic ibex and long-tailed marmot occurred in similar terrain type [28]. The average group size of ibex was less than 11, which is consistent with that reported in other parts of the Kargil district [23].

The mammalian carnivores that we recorded were red fox, Tibetan wolf and the snow leopard. We observed 8 individuals of red fox, while only the signs such as pugmarks, scrapes and scats were recorded of the other species. Snow leopard signs were always found near cliff base, along ridgelines or the base of over-hanging rocks. We recorded one omnivore: brown bear. Signs of this species were found mostly in the riparian and rocky areas. Bear use rocky areas as transitory routes hence their signs in this habitat type. Local people also reported the presence of the Eurasian otter, stone martin, Himalayan weasel, pikas and voles. However, we did not observe any of these species during the survey.

As far as the birds are concerned, we recorded equal number of residents and migratory birds. The birds recorded were dominated by Passeriformes, which is consistent with other reports on avifauna from the region [2,21,22]. Species composition in the area was similar to that recorded elsewhere in Ladakh. As almost half of the species recorded were summer visitors, it is pertinent to mention that the area serve as an important area for migratory birds. We observed maximum number of bird species in riverine habitats and agricultural fields. This is perhaps due to the season of the survey, which was carried out in May when other habitat types were still dry.

Talking to knowledgeable people in the area, we came to know that the major challenges for the mammal conservation are rapid infrastructure development, retaliatory killing of wild predators when the latter kill livestock, and competition of wild ungulates with domestic livestock. Feral dogs are also important threats to wild animals in the region. Lack of awareness among people about the importance of wildlife is also a major challenge. The resultant administrative apathy is a major stumbling block to wildlife conservation. The most despised wild animals are the brown bear and the snow leopard. Brown bear kills livestock as well as raid ration stores, while the snow leopard is notorious for getting inside livestock corrals and killing multiple livestock, especially sheep and goats in a single night.

For the birds, extensive use of artificial fertilizers and pesticides are the main threats, as a majority of the birds were recorded in agricultural habitats. People rely on artificial fertilizers and pesticides largely due to heavy subsidy on these products, and also due to global warming and associated surge in the population of pests. Furthermore, greater economic opportunities also have led to people keeping less livestock, the main source of manure. Another important threat to the birds is the modification of riverine habitats for agriculture and plantation.

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