
AVI-FAUNAL DIVERSITY OF LADAKH AS A KEY TO UNLOCKING WILDLIFE TOURISM POTENTIAL

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Birds are distinct, omnipresent, and among the most extensively studied vertebrates on the planet. Their unique behaviors, melodious songs, and vibrant colors pique people's curiosity about these fascinating creatures. Birdwatchers, numbering in the millions, passionately observe avian species all across the globe. Among these enthusiasts, Ladakh holds a special place, located in the Trans-Himalayas of the Himalayan Mountain system. Ladakh is flanked by the Karakoram range to the north and the Great Himalayas to the south. Due to its strategic location on the border between the Palearctic and Indo Malayan Zoogeographic Zones, Ladakh boasts a distinctive avifauna representative of both regions. In this article, the author and a group of nature enthusiast friends have meticulously documented the avian fauna of Ladakh over a period of seven years. Their journey involved extensive travels across Ladakh, with the primary objective of discovering new bird species and identifying rare avian sightings. To aid in the process of bird identification, a comprehensive range of resources was utilized, including photographs, field guide books, traditional knowledge, online bird databases and websites, journals, articles, and personal experiences. With technology becoming accessible to all, bird enthusiasts in Ladakh are also utilizing the eBird app to upload their checklists and maintain their observations. The eBird app, developed by Cornell Lab of Ornithology, serves as an online database for bird sightings. According to the data provided by the eBird app, there have been 430 bird species recorded in Ladakh to date (eBird, 2023). This includes areas of Gilgit-Baltistan under the Pakistan-occupied Jammu and Kashmir region. However, when considering the bird species reported specifically from the Ladakh region under Indian administration, the total number comes to 425. These birds are categorized into 19 Orders and 61 Families. The availability of such comprehensive data allows for a better understanding of the avian diversity in the region and aids in conservation efforts.

The bird species found in Ladakh can be broadly categorized into two main groups: resident birds and migratory birds. To ensure an organized and precise study of each species, additional subdivisions have been created within these categories. These subdivisions aim to streamline the analysis and examination of every avian species, making the study more accessible and comprehensive. By implementing these divisions, a more systematic approach can be taken towards the analysis and understanding of the diverse bird population in Ladakh.

1. Resident Birds

Resident Birds are observed and documented throughout the year, with the majority of them breeding in the same area. Some notable examples of these avian species include the Eurasian Magpie (*Pica pica*), Ibisbill (*Ibidorhynchastruthersii*), Carrion Crow (*Corvus corone*), Chukar (*Alectoris chukar*), Little Owl (*Athene noctua*), Tibetan Sandgrouse (*Syrrhaptes tibetanus*), Bearded Vulture (*Gypaetus barbatus*), Mongolian Finch (*Bucanetes mongolicus*), Tibetan Snowcock (*Tetraogallus tibetanus*), Eurasian Eagle Owl (*Bubo bubo*), and Golden Eagle (*Aquila chrysaetos*). Some resident birds can be classified as

Altitudinal Migrants, indicating their inclination to move across various altitude ranges during the spring season for breeding and raising their young. During the winter months, they descend to lower valley bottoms. A few examples of these birds include the Streaked Rosefinch (*Carpodacus rubicillodes*), White-winged Redstart (*Phoenicurus erythrogastrus*), Eurasian Wren (*Troglodytes troglodytes*), and White-browed Tit Warbler (*Leptopoecilesophiae*). Some selected Resident Birds are shown in Fig 1.



Fig. 1. Resident Birds (a) Tibetan Snowcock (b) Tibetan Sandgrouse (c) Bearded Vulture (d) Eurasian Eagle Owl (e) Ibisbill (f) Chukar

Migratory Birds

Migratory birds comprise the majority of bird species reported in Ladakh, with approximately 65 percent of the total recorded birds being migrants. These birds can be further classified as follows:

(a) Passage Migrants

Passage Migrants are a distinct group of birds that can be observed in Ladakh for only a brief period of time. They utilize a few key stopover sites in order to feed and refuel before continuing their journey to their primary breeding areas outside of Ladakh during the spring season. Additionally, these birds can also be seen during the autumn season as they migrate back towards their wintering grounds. Examples of passage migrants include the Northern Wheatear (*Oenanthe oenanthe*), Red-tailed Shrike (*Lanius phoenicuroides*), Osprey (*Pandion haliaetus*), Barred Warbler (*Currucanisorina*), Goldcrest (*Regulus regulus*), Demoiselle Crane (*Grus virgo*), Eurasian Curlew (*Numenius arcuata*), Greylag Goose (*Anseranser*), as well as rare species such as the Lesser Grey Shrike (*Lanius minor*), Rustic Bunting (*Emberiza rustica*), Meadow Pipit (*Anthus pratensis*), and Wood Warbler (*Phylloscopussibilatrix*). Notably, both the Meadow Pipit and Wood Warbler have only been photographed in the Ladakh region within India. Some selected Passage Migrants are shown in Fig 2.



Fig 2. Passage Migrants (a) Wood Warbler (b) Osprey (c) Greylag Goose (d) Goldcrest (e) Demoiselle Crane

(b) Summer Visitors

Summer Visitors are migratory species that are recorded in the Ladakh region from mid-March until mid-October. They utilize the Ladakh range as their breeding site. Among the well-known summer visitor species in the region are the Black-necked Crane (*Grus nigricollis*), which is also the state bird of UT Ladakh, the Bar-headed Goose (*Anser indicus*), known as the world's highest-flying bird, and the Endangered Saker Falcon (*Falco cherrug*). Other noteworthy species include the Eurasian Hobby (*Falco subbuteo*), Tibetan Lark (*Melanocorypha maxima*), Upland Buzzard (*Buteo hemilasius*), Eurasian Hoopoe (*Upupa epops*), Great Crested Grebe (*Podiceps tristatus*), Common Cuckoo (*Cuculuscanorus*), and Mountain Chiffchaff (*Phylloscopussindianus*), among others. Some selected Summer Visitors are shown in Fig 3.



Fig 3. Summer Visitors (a) Upland Buzzard (b) Eurasian Hobby (c) Black-necked Crane (e) Bar-headed Goose

(c) Winter Visitors

Winter Visitors are species that can be observed during the winter months in Ladakh, from mid-October until mid-April. During this time, the average temperature remains below -10° Celsius, and in certain areas, it even dips below -30 ° Celsius. Despite the harsh winters, some bird species bravely survive these extreme temperatures. Noteworthy species in this category include Naumann's Thrush (*Turdus naumanni*), Dusky Thrush (*Turdus eunomus*), Brambling (*Fringilla montifringilla*), Eurasian Woodcock (*Scolopaxrusticola*), Hen Harrier (*Circus cyaneus*), Merlin (*Falco columbarius*), Himalayan Buzzard (*Buteo reffectus*), Northern Goshawk (*Accipiter gentilis*), Himalayan White Browed Rosefinch (*Carpodacus thura*),

Buff-bellied Pipit (*Anthus rubescens*), and Common Snipe (*Gallinago gallinago*). Some selected Winter Visitors are shown in Fig 4.



Fig 4. Winter Visitors (a) Naumann's Thrush (b) Himalayan Buzzard (c) Eurasian Woodcock (d) Dusky Thrush (e) Brambling

(c) Vagrant/Straggler

During the migration season, a few bird species may deviate from their main migratory routes due to adverse weather conditions and the lack of food at their regular stopover sites across the trans-Himalayan range. These species, when sighted in Ladakh outside of their typical migratory paths, are referred to as vagrants or stragglers and are generally observed individually. Some examples of these vagrants/stragglers include the Common Shelduck (*Tadornatadorna*), Amur Falcon (*Falco amurensis*), Red Crossbill (*Loxiacurvirostra*), Shikra (*Accipiter badius*), Rufous-bellied Niltava (*Niltavasundara*), Paddyfield Pipit (*Anthus rufulus*), Bohemian Waxwing (*Bombycillagarrulus*), Whistler's Warbler (*Phylloscopus whistleri*), Sedge Warbler (*Acrocephalus schoenobaenus*), Garden Warbler (*Sylvia borin*), Common Wood Pigeon (*Columba palumbus*), Trumpeter Finch (*Bucanetes githagineus*), Oriental Dollarbird (*Eurystomus orientalis*), Daurian Starling (*Agropsar sturninus*), Rough-legged Buzzard (*Buteo lagopus*), and Sharp-tailed Sandpiper (*Calidris acuminata*). Some selected vagrant/straggler are shown in Fig 5.



Fig. 5. Vagrant/Straggler (a) Trumpeter Finch (b) Red Crossbill (c) Paddyfield Pipit (d) Common Shelduck

In conclusion, the avian faunal diversity of Ladakh holds immense potential for unlocking wildlife tourism in the region. Ladakh's unique geographical features, including its high-

altitude desert environment and varied habitats, have contributed to the presence of a rich birdlife. Through the use of technology, such as the eBird app, bird enthusiasts in Ladakh are actively documenting their observations and contributing to the growing database of avian species. The recorded data reveals a remarkable diversity of bird species, with 430 recorded in Ladakh, including areas of Gilgit-Baltistan under Pakistan's administration. For the Indian-administered Ladakh region specifically, there have been 425 bird species documented across 19 Orders and 61 Families. This wealth of avian biodiversity presents a valuable opportunity for wildlife tourism development in the region. By leveraging the avi- faunal diversity of Ladakh, tourism initiatives can be designed to cater to birdwatchers and nature enthusiasts. Wildlife tourism can be a sustainable form of economic growth, providing local communities with livelihood opportunities while fostering conservation efforts. Efforts to promote and protect the avian diversity of Ladakh should focus on sustainable tourism practices, conservation education, and the preservation of natural habitats. Collaboration between local communities, governmental agencies, and conservation organizations is crucial for ensuring the long-term success of wildlife tourism in Ladakh. Overall, Ladakh's avi-faunal diversity stands as a key asset that, when properly harnessed, can unlock the full potential of wildlife tourism, bringing economic benefits and conservation outcomes to the region.