



Diversity of avian fauna in Nowshera Tehsil of District Rajouri, J&K, India

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Abstract

Union Territory (UT) of Jammu and Kashmir (J&K) is situated at the intersection of two bio- geographic regions of the world, namely the Palearctic and the Oriental regions. Besides harboring some species that are shared with the tropical and subtropical parts of the Indian subcontinent, it is home to some faunal elements, particularly among birds and mammals that are unique to higher altitudes. During the study we found 31 species in the study area which belonged to 10 orders and 20 families. Among the orders, Passeriformes was the one that contained 54 % of the species. That shows Passeriformes order is the most common order of the birds in the study area. Among the 20 families of species that were found in the study area, Muscicapidae family contained maximum number of species. As far as distribution status is concerned we found, residents, passage migrants and winter visitors in the study area. Majority of the birds belonged to resident category. 97% of the birds were found to belong to the Least Concern (LC) category of IUCN status. The only species that was found to be vulnerable in the study area was the *Columba eversmanni* (Yellow-eyed pigeon). Among all the 31 species that were found in the study area, 24 (77%) were found rarely, 10% were common, 6% occasional, 6% were uncommon in the area. Among the common species are the common Myna, Sparrow and Rufous-naped tit.

Keywords: Avifaunal Diversity, Bird Families, Passeriformes, IUCN status, point transect

Introduction

Union Territory (UT) of Jammu and Kashmir (J&K) is situated at the intersection of two bio- geographic regions of the world, namely the Palearctic and the Oriental regions. Besides harboring some species that are shared with the tropical and subtropical parts of the Indian subcontinent, it is home to some faunal elements, particularly among birds and mammals that are unique to higher altitudes (Suhail et al 2020).

Avifauna is one of the most important ecological indicators for assessing habitat quality. Birds play an important role in crop pest management as rodent predators, scavengers, seed dispensers and pollinating agents. As a result, birds are raised not only to preserve ecological balance, but additionally to produce economically valuable products like down feathers. The Indian landmass' bird habitats are frequently classified as forest, scrub, wetlands, marine, grassland, desert, and agricultural land. Several bird species require a diverse range of home grounds. For conservation measures to be implemented, it is necessary to understand the species diversity and the type of the species. Birds are an important component of any natural ecosystem; they help control insect pests of agricultural crops.

Birds may be influenced by various geographical conditions (Karr, 1976). Water bodies such as wetlands, ponds, lakes, etc. are important conservation site due to rich biodiversity and are among the most productive ecosystems worldwide. They harbor many globally threatened species. Diverse wetland complex are of greatest value in providing habitat for aquatic bird species (Miller, 2003). The avifauna is important for the ecosystem as they play various roles as scavenger, pollinators and predators of insect pest.

Birds live in different habitats, have varied social structures and also show behavioral responses. Birds may live in open areas like grasslands or agricultural systems, and are easy to see. Conversely, they may inhabit dense vegetation, which obstruct a straightforward view. Some birds may be gregarious and may live in flocks of thousands, whereas others may be solitary or in pairs. Behavior too may vary, with certain species being very bold while others are very shy and skulking. Applying a single method to count such a variety of birds is neither feasible nor advisable. An observer may have to select the most appropriate method for particular species or habitat (Javed & Kaul, 2002).

Out of the 1224 species of birds reported from India, 79 are globally threatened, with 8 listed as critical and in immediate danger of extinction. A further 57 species are listed as near threatened, meaning that if immediate steps are not taken to reverse the trend, they will also join the threatened category (Islam & Rahmani, 2002). Bird census data, either from surveys or intensive studies, have been used to project the current population levels and to estimate densities. These are an integral part of most avian community studies. Density and diversity are very useful attributes and valuable indicators of habitat quality and have great significance from management perspective.

The point count is one of most common methods to survey birds in forest ecosystems of Tropical regions. It involves mainly auditory detections of birds within fixed or unlimited radius plots. Its accuracy and efficiency are substantially influenced by observer effort, affecting information such as richness and species abundance (Hutto et al. 1986). According to Suhail et al (2020) a total of 555 species of birds belonging to 20 orders occur in the Jammu and Kashmir State. This

constituted 40.36% of the total bird species count (1375) for the Indian subcontinent. Out of 105 families occurring in the subcontinent, 76 (72.38%) are represented in this State. Passerines (Order Passeriformes) are the dominant group represented by 40 families with 287 species (57.40% of the total count for the State). All but 9 out of 49 families (81.63%) of Passerines occurring in the subcontinent are represented here. Among all the families present in the State, Muscicapidae has the highest number of species (42), followed by Accipitridae (39) and Anatidae (26). Of the major families (having at least 20 species), Motacillidae (wagtails and pipits) is the best represented, followed by Paridae, Accipitridae (hawks, kites, and eagles), Anatidae (ducks, geese, and swans), and Aluididae (larks).

Study area

Tehsil Nowshera of District Rajouri, Jammu & Kashmir, India lies in south and west of PirPanjal Mountain Range located latitudinally 33° 16' 04" N and longitudinally 74° 24' 43" E at an altitude of 1574 m. The area displays steep slopes and high ridges broken by rocky cliffs and in between narrow valleys. Floristically this area is inhabited by the sub-tropical and temperate forests. The present study was undertaken in the Jhanger area of Nowshera. This area is taken for the study because no such study has been previously documented in this area.

Methodology

The study area was surveyed for recording avifaunal diversity by applying point transect method. The surveys were carried out from December 2022 to January 2023 every week during the morning between 7:30 am to 10:30 am and evening between 3:30 pm to 5:30 pm. During this time period birds are more active. Performing point counts in days with rain and fog were avoided. In addition to these fixed timings of surveys, some irregular visits were planned and made during other hours of the day. In the entire study 40 counts were taken. Grimmett et al. (1998) was used for identification of the bird species.

The IUCN status and the distribution status of the bird species was taken from the published literature (Suhail et al 2020). Local abundance status of the recorded bird was established the criteria followed by (Srinivasulu and Nagulu 2002 and Ali S et al 2022): Common (C) which is recorded 9-10 times out of 10 visits, uncommon (UC) which is recorded 6-8 times out of 10 visits, occasional (O) which is recorded 3-5 times out of 10 visits, rare (R) which is recorded 0-2 times out of 10 visits. Observations were carried out with the help of Binoculars whenever found necessary.

Point counts are essentially strip transects of zero length in which the observer performs the count in a 360° arc around a fixed survey station. Survey stations are randomly located throughout the study area to obtain representative samples of the species and numbers of each species present. If density estimates are desired from point counts, the counts are limited to objects within a fixed radius from the survey point. In such cases, the sampled plot becomes a circular plot of specified radius from the survey point. As related survey techniques, many of the issues involved for strip transects also apply to point counts. However, some important differences should be noted. Unlike strip transect surveys, point counts are usually conducted for a pre-determined and fixed period time, usually after allowing for the avian population to come to "rest" before the survey begins. Point counts are limited to ground and boat-based surveys because observers must remain at the fixed count station. Point count surveys have been developed for a variety of species and habitats which may not be effectively surveyed with other survey techniques.

Results and Discussion

Taxonomic Diversity

A total of 31 species belonging to 20 families and 10 orders were found in the study area (Table 1). This constitutes 5.6 % of the 555 species in the J&K as were found by the Suhail et al 2020. And 2.25 % of the total bird species count (1375) for the Indian subcontinent. Out of the 105 families present in the subcontinent, 20 families i.e., 19% of the families were found in the study area. Among the orders, Passeriformes order was found to be the dominant one, which contains 17 species i.e., 54.8 % of the species count were represented by it. This was followed by order Galliformes which contained three species (Figure 1).

Among the families that occurred in the study area, Muscicapidae was found to contain maximum number of species i.e., 4 species (12.9%). This was followed by Phasianidae family which contains three species in the study area.

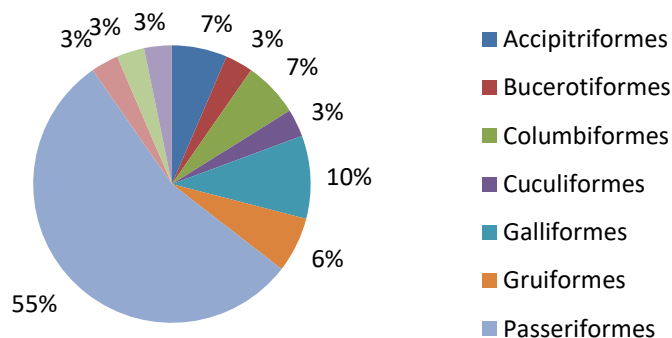


Figure 1: Order wise distribution of bird species

Order Accipitriformes

Scientific Name	Common Name	Family	Distribution	IUCN	
				Status	Status
<i>Clanga hastata</i>	Indian Spotted Eagle	Accipitridae	R	LC	R
<i>Hieraaetus fasciatus</i>	Bonelli's eagle	Accipitridae	R	LC	R

Order Bucerotiformes

<i>Upupa epops</i>	Eurasian hoopoe	Upupidae	R/W	LC	R
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Order Columbiformes

<i>Columba eversmanni</i>	Yellow-eyed pigeon	Columbidae	R/W	VU	R
<i>Streptopelia chinensis</i>	spotted dove	Columbidae	R/W	LC	R

Order Cuculiformes

<i>Surniculus lugubris</i>	square-tailed drongo-cuckoo	Cuculidae	R	LC	R
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Order Galliformes

<i>Francolinus pondicerianus</i>	Grey francolin	Phasianidae	R	LC	R
<i>Lophura leucomelanos</i>	Kalij pheasant	Phasianidae	R	LC	R
<i>Pavo cristatus</i>	Indian peafowl	Phasianidae	R	LC	O

Order Gruiformes

<i>Porzana fusca</i>	Ruddy-breasted crane	Rallidae	R	LC	R
<i>Rallina eurizonoides</i>	Slaty-legged crane	Rallidae	R/W	LC	R

Order Passeriformes

<i>Acridotheres tristis</i>	Common myna	Sturnidae	R	LC	C
<i>Acrocephalus concinens</i>	Blunt-winged warbler	Acrocephalidae	W	LC	R
<i>Acrocephalus melanopogon</i>	Moustached warbler	Acrocephalidae	W	LC	R
<i>Aegithalos concinnus</i>	Black-throated bushtit	Aegithalidae	R	LC	R
<i>Copsychus saularis</i>	Oriental magpie-robin	Muscicapidae	R	LC	R
<i>Corvus macrorhynchos</i>	Large-billed crow	Corvidae	R	LC	UC
<i>Dendrocitta vagabunda</i>	Rufous treepie	Corvidae	R	LC	O
	Brown-fronted woodpecker	Picidae	R	LC	R
<i>Dendrocopos auriceps</i>					
<i>Megalurus palustris</i>	Striated grassbird	Locustellidae	R/W	LC	R
<i>Myophonus caeruleus</i>	Blue whistling thrush	Muscicapidae	R/W		R
<i>Parus rufonuchalis</i>	Rufous-naped tit	Paridae	R	LC	C
<i>Passer domesticus</i>	House sparrow	Passeridae	R	LC	C
<i>Phoenicurus Coeruleocephalus</i>	Blue-capped Redstart	Muscicapidae	R/W	LC	R
<i>Phylloscopus fuscatus</i>	Dusky warbler	Phylloscopidae	P	LC	R
<i>Phylloscopus neglectus</i>	Plain leaf warbler	Phylloscopidae	V	LC	R
<i>Saxicola caprata</i>	Pied bush chat	Muscicapidae	S/W	LC	R
<i>Sylvia curruca</i>	Lesser whitethroat	Sylviidae	S	LC	R

Order Pelecaniformes

<i>Egretta garzetta</i>	Little egret	Ardeidae	R/P	LC	R
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Order Psittaciformes

<i>Psittacula krameri</i>	Rose-ringed parakeet	Psittaculidae	R	LC	UC
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Order Strigiformes

<i>Strix aluco</i>	Tawny owl	Strigidae	R	LC	R
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Table 1: Species found in the study area, their distribution, IUCN status and local status.

Distribution and Status

Resident (R): These are the species that are found throughout the year. Most of these breed in the area. Populations fluctuate and may get augmented temporarily with migrating individuals from outside. In the study area residents birds were abundantly found. They were the ones that were mostly found in the study area. More than 60% of the species in the study area were the residents.

Passage Migrant (P): These species are found for a brief period of the year only. These species are on passage to or from their wintering destinations elsewhere and use the area briefly as a transit. In the study area only one species was found as a peasant species.

Winter Visitor (W): Species recorded during winter months (September/October to February/March). The winter visitors were also found in the study area.

Threatened Taxa

Rahmani et al. (2014) have listed 24 bird species from J&K which fall under one of the four categories of threatened taxa under the IUCN Red List. The four categories include Critically Endangered (CR), Endangered (EN), Vulnerable (VU) and Near Threatened (NT). In the present study area only one species was found to be belonging to these four categories. This species was *Columba eversmanni* and it belonged to UV category. The other species that were found in the study area were of least concern category. They were found abundantly in the current study area.

Local Status

Among all the 31 species that were found in the study area, 24 (77%) were found rarely, 10% were common, 6% occasional, 6% were uncommon in the area (Figure 2). Among the common species are the common Myna, sparrow and Rufous-naped tit. According to Ali S et al (2022) a large number of species can be found in the summer as compared to the winter. These authors worked on the avifaunal diversity in similar study area. They found a total of 50 species in the whole Rajouri district. They suggested that factors such as elevation, topography, climate and habitat heterogeneity have a marked influence on the distribution pattern of avian fauna in the study area.

Since our study was focused in the winter that may be the reason that we find less number of species than them. More over some species migrate to the warmer regions in the winter and were not found. In the study area the nets of some birds like weaver birds could be traced but the birds were not found in the area.

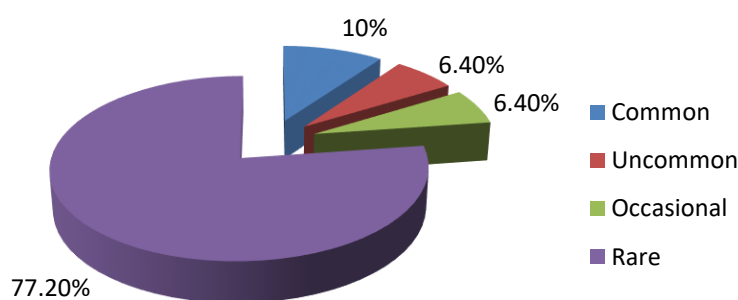


Figure 2: Local Abundance of Birds

Human Peacock Conflict

A human peacock conflict was also found in the study area. Peacocks (Indian peafowl) usually prefer to live in the agricultural fields in the study area, in which the farmers have sown wheat crop. The peacocks visit the agricultural fields for foraging and in the process damage the wheat crop of the farmers. This has resulted in the conflict between the two. This issue needs to be understood in detail to address the issue properly, otherwise the population of the peacocks in this area may fall in near future.

Conclusion

Birds play a noteworthy function in ecosystem. Birds are an imperative component of biodiversity and their occurrence and distribution are an important phenomenon to understand the overall picture of a habitat. Avifauna is one of the best indicators of environmental changes. The population of birds in any kind of ecosystem shows the environmental quality of the area, pollution level, security and availability of food and habitat.

In the current study it was found that the area is rich in avifaunal diversity. A total of 31 species were found in the study area during a time period of less than a month. Since the study was undertaken in the winter, so the number of species of birds was found lower than the similar studies found in the nearby area.

Nine orders were found in the study area and the family that contains the maximum number of species was the Passeriformes which contained about 77% of the all species that were found. A similar comprehensive study can be undertaken to enlist the overall bird diversity in the study area and the spatio-temporal variation can be also observed.

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