

## STUDY OF AVIFAUNA OF GULMARG WILDLIFE SANCTUARY, J&K, INDIA

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### ABSTRACT

The present study was conducted to explore the status of avifauna in Gulmarg wildlife sanctuary. Transect method was used to cover the study area. A total of 24 species of birds belonging to 18 families under 5 orders were recorded of which 3 species belonged to family Columbidae, 2 species to Muscipidae and 2 species were from family Motacillidae and most of other families represent a single species. However many of the species are residents and a few were migrant. The most important migrant species included Eurassian Collard Dove, Common Hoopoe, Turtle Dove, and Flycatcher. The presence of Kashmir Flycatcher in this Sanctuary indicated that the sanctuary harbours 1 threatened species also. Meadow Site was having the diversity index of (2.959), Forest Site (2.958) and Tangmarg site had the diversity index of (2.225). The Simpson's Index of Meadow Site, Forest Site and Tangmarg Site were 0.061, 0.059 and 0.133 respectively.

**Keywords:** Avifauna, Diversity index, Sanctuary, Species, Species Richness

### I INTRODUCTION

Aves are considered masters of air and are viewed as indicators of quality of the environment, because the health of bird populations mirrors the health of the environment. The recent reports about rapid decline in bird populations and the accelerating extinction rates of birds in the world forests, grasslands, wetlands, and islands are of great concern. Now-a-days, avifaunal diversity has been decreasing due to the destruction of natural habitats and human generated disturbances. Random destruction of natural habitats by cutting nesting trees and foraging plants for commercial use of wood and land are the main factors responsible for narrowing down in avian foraging habitats and their nesting sites. Because of this, many species of birds may be forced to inhabit the urban areas and constrain them to breed there. The Indian sub continent is a part of the vast oriental biogeographic region is very rich in biodiversity. The Indian region harbours an incredibly rich avifauna. Out of the more than 9000 birds of the world, the Indian Sub Continent contains about 1300 species or over 13% of the world's birds Grimmett et al. [1]. According to Agarwal [2] there are about 1228 species of birds in India Zoo geographically, the location of Jammu and Kashmir is of paramount importance because of central position in Asia and also a door way in between Palearctic and oriental region in the northern India. The Palearctic

elements in the fauna of Kashmir mainly pertain to Manchurian region. Jammu and Kashmir lies in the Western Himalayas Endemic Bird Area where 11 Restricted Range species have been listed by Stattersfield et al. [3]. There have been a number of studies on birds in the Kashmir region Ali and Ripley [4], Bates and Lowther [5], Shah [6] but there is no information regarding the diversity and richness of bird species in the Gulmarg wildlife sanctuary. In order to fill this knowledge gap, the present study was undertaken.

## II STUDY AREA

Gulmarg is located between  $34^{\circ} 03' 00''$  N and  $74^{\circ} 22' 48''$  E, at an average altitude of 2,680m above mean sea level (amsl) in the Baramulla district of J&K state. It is situated at a distance of 57 km southwest from the capital city of Srinagar and is close to the Indo-Pakistan border. It is a majestic hill station nestled with stunning peaks in the Himalayan ranges, with its lush green backdrop, beautiful landscapes, flowering gardens, serene lakes and pleasant climate during the summers. Gulmarg has a varied topography and a total of 4 major landforms were identified. About 70% of the area falls under steep slopes where land cover is dominated by pasture, scrub or bare rocky area, 26% of the area comprises of mountain tops and high ridges, where evergreen coniferous forests dominate, 4% of the area comprises of canyons or deeply incised streams, while a very meager percentage comprises of plains.

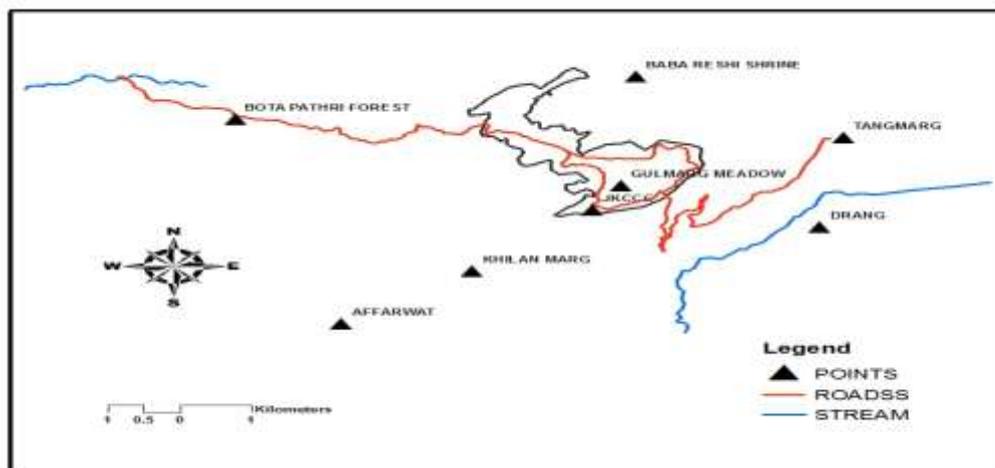


Fig.1: Map of study area

### 2.1 Site Description

#### 2.1.1 Site -1 (Meadow site)

The Site is located between  $34^{\circ} 02' 51.6''$  N and  $74^{\circ} 23' 09.3''$  E, at an altitude of 2687 m (amsl). It is about 60m away from the main market of Gulmarg and taxi stand.

**2.1.2 Site -2 (Forest site)** The Site is located between  $34^{\circ} 02' 41.6''$  N and  $74^{\circ} 23' 09.3''$  E, at an elevation of about 2684m (amsl). This site had a mixed type of vegetation dominated by *populous migra.*, *Rolinia pseudacacia*, and dotted with *Pinus wallichiana* trees also.

**2.1.3, Site -3 (Tangmarg)** The Site is located in Tangmarg between  $34^{\circ} 03' 35.7''$  N and  $74^{\circ} 25' 31.7''$  E at an elevation of 2153 m (amsl). This site is surrounded by the *Populus alba* and *P.migra* trees.

### III MATERIALS AND METHODS

A thorough survey was conducted to study the diversity of birds in the study area. Line Transect method Sale and Berkmuller [7] was used. Surveys were conducted early in the morning and in the evening. Besides this, some irregular visits were also made during different hours of the day.

### IV RESULTS AND DISCUSSION

A total of 24 species belonging to 18 families under 5 orders were recorded from May to October (Table 3.1). Out of total bird species recorded over the study period, 3 species belonged to family Columbidae, 2 species to Muscipidae and 2 species were from family Motacillidae and most of other families represent a single species. However many of the species are residents and a few were migrant. The most important migrant species included Eurassian Collard Dove, Common Hoopoe, Turtle Dove, and Flycatcher. The number of bird species at Meadow site and Forest site were high than Tangmarg site. The presence of Kashmir Flycatcher in this Sanctuary indicated that it harbours 1 threatened species also. Being one of the important areas of the birds, the Gulmarg Wildlife Sanctuary was found to harbour both migrant and resident bird species. Data collected during the study indicated that the habitat supported diverse bird communities. The Specie Richness index (Fig. 3.1) of Meadow site, Forest site and Tangmarg site were highest in the month of June and July. The diversity index (Fig. 3.2) was 2.959, 2.958, and 2.225 in Meadow site, Forest site and Tangmarg site respectively. The dominance indices (Fig. 3.3) of three sites were 0.061, 0.059 and 0.133 in Meadow site, Forest site and Tangmarg site respectively. Structural diversity and floristic diversity tend to be positively associated with the bird diversity during non breeding season (Hobson and Bayne [8], Rodewald and Brittingham [9]). Different birds were found to occupy different niches. Out of 24 bird species 29.16% were sighted on ground, 33.3% were sighted on middle canopy periphery, 29.16% were sighted on top periphery of canopy. Black kite (*Milvus migrans*), Turtle dove (*Streptopelia orientilus*), Eurassian Collard dove (*Anthus roseatus*) were mainly sighted on upper parts of the trees, while as Rock Pigeon (*Columbia livia*), White Cheaked Bulbul (*Pycnonotus leucotis*), Red capped sparrow (*Spizella Passeriformes*) were sighted at middle of canopy. Hoopoe (*Upapa epops*), Grey wagtail (*Motacilla cinerea*) were sighted on ground. When the ranges of species overlap those occupying in the same fraction of a given resource, dimensions should differ along other dimensions due to either niche complementarity or resource partitioning (Schoener [10]). The number of some birds like House sparrow, Jungle crow were highest at Tangmarg, where as Larks were found only in Meadow sites. The species like Jungle crow and Rock pigeon were abundant, where as Hoopoe, flycatcher, Rosy pipit and Grey waigtail were rarely found.

**Table.3.1: Abundance of bird population observed at three different sites in the study area**

S.No	Common Name	Scientific Name	May	June	July	Oct
1	House sparrow	<i>Passer domesticus</i>	43	48	64	51
2	Jungle crow	<i>Corvus macrorrhynchus</i>	64	77	63	51
3	Streaked laughing thrush	<i>Garrular linetus linetus</i>	17	26	19	7
4	Turtle dove	<i>Streptopelia orientilus</i>	17	27	21	-
5	Rock pigeon	<i>Columbia livia</i>	58	75	61	45
6	Flycatcher	<i>Muscicapa sp</i>	10	11	9	-
7	Finch	<i>Fringilla coelebs</i>	10	12	21	3
8	Common myna	<i>Acridotherus tristis tristis</i>	26	33	45	29
9	Lark	<i>Alavida arvensis</i>	9	9	6	-
10	Black kite	<i>Milvus migrans</i>	27	43	43	40
11	White cheeked bulbul	<i>Pycnonotus leucotis</i>	24	33	34	15
12	Large tailed Shrike	<i>Lanius sehachs</i>	4	9	21	1
13	Hoopoe	<i>Upapa epops</i>	8	14	16	-
14	Blue rock thrush	<i>Monticola solitarius</i>	6	7	15	8
15	Blue whistling thrush	<i>Myophonus ceeruleus temnickii</i>	4	14	7	-
16	Yellow billed blue magpie	<i>Uroscissa flavirostris</i>	-	7	21	18
17	Piscus sp	<i>Picus squamatus</i>	1	13	4	1
18	Common kestrel	<i>Falco tinnunculus</i>	6	15	14	4
19	Common stonechat	<i>Saxicola torquatus</i>	-	6	14	-
20	Grey wagtail	<i>Motacilla cinerea</i>	-	20	-	-
21	Red capped sparrow	<i>Spizella Passeriformes</i>	8	35	35	6
22	Northwestern iora septentriionalis Koelz	<i>Aegithina tiphia</i>	28	26	36	19
23	Rosy pipit	<i>Anthus roseatus</i>	28	9	8	-
24	Eurasian collard dove	<i>Streptopelia decaocto</i>	29	25	9	-

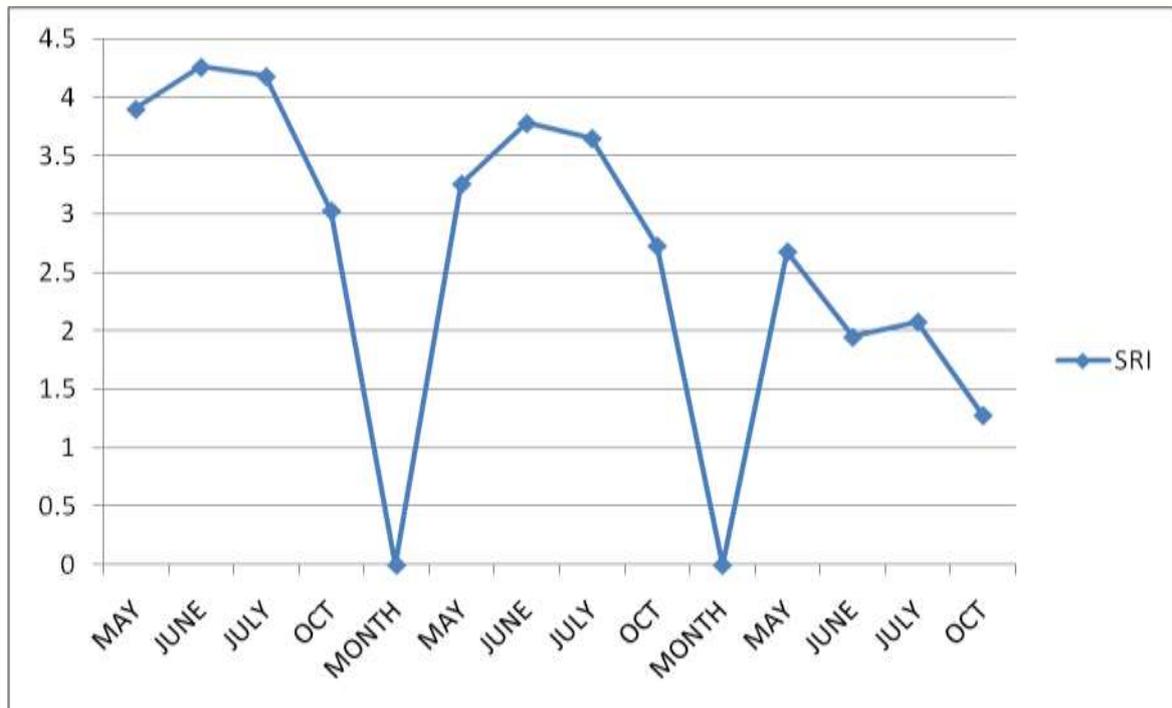


Fig.3.1 Species Richness Index of three sites during entire sampling.

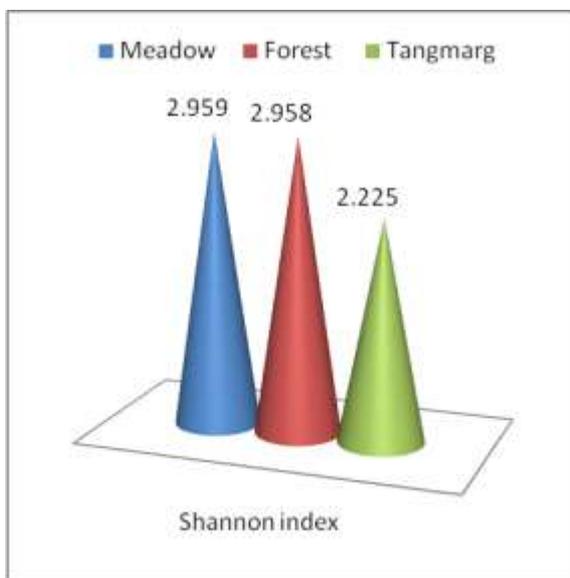


Fig.3.2: Shannon index of different sites of Gulmarg Wildlife Sanctuary

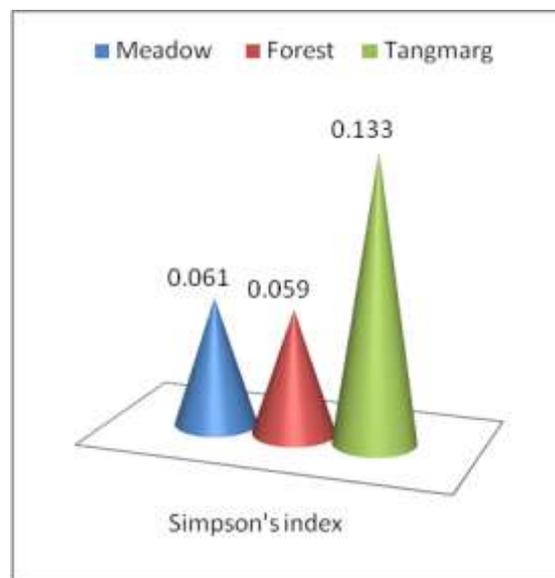


Fig.3.3: Simpson's index of different sites of Gulmarg Wildlife Sanctuary

The number of some birds like Jungle crow, Black kite, House Sparrow was highest at Tangmarg as compared to other two sites. These indicate that these resident species of birds are highly habituated to urbanisation.

Observation revealed that most of the migratory birds (summer migrants) arrive here during second and third week of May. However, arrival dates vary from year to year depending upon the weather and vegetation. Most of the migrants leave during the wet season (autumn) for their winter quarters and return to their breeding grounds on the following spring. These kinds of species are referred as two way wanderers as they migrate to their winter quarters back, unlike emigrant birds which do not return to their birth places (Berthold [11]). Out of 24 species recorded Streaked Laughing Thrush, Flycatcher, Lark, Large tailed Shrike, Hoopoe, Common Stonechat, Grey Wagtail, Rosy Pipit, Eurassian Collard Dove were found to be totally migrant bird species. Most of the birds were found to feed on insects, and the waste material thrown out from hotels, huts etc. The reason that many species like Jungle crow, Black Kite, House Sparrow were mostly found in open areas due the presence of these waste materials on which they feed. The higher abundance of Black Kite and House Crow were sighted in Tangmarg, the reason may be that higher quantities of wastes were thrown out at Tangmarg Shrine. The Gulmarg Wildlife Sanctuary is an important habitat for Kashmir Flycatcher which is a threatened species worldwide. The Gulmarg Wildlife Sanctuary is one of the several important Bird areas of the country. The Ornithological information on species composition and relative abundance of the avifauna of the Gulmarg Wildlife Sanctuary can be used as a baseline data for further survey and research. The information would also help in designing proper conservation measures for the Gulmarg Wildlife Sanctuary in the future.

#### IV CONCLUSION

The study concluded that Gulmarg Wildlife Sanctuary offers a favourable habitat for avifauna. The Sanctuary has large number of visitors (birds) which arrive in early and late spring. The sanctuary could have more species of birds if measures are taken to manage the area from anthropogenic activities that have threatened the life of birds. Various threats prevail at the sites among which habitat destruction and pollution due to wastes from hotels and huts around the sanctuary are major ones. The construction of hotels causes heavy deforestation, which lead to habitat destruction of bird species.

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