

SPREAD OF SEVERAL ORDERS' AVIFAUNAL SPECIES RESIDENTIAL STATUS OF MIGRATORY BIRD SPECIES AT THE BHINDAWAS BIRD SANCTUARY, BROKEN DOWN BY FAMILY.

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Abstract: The Bhindawas Bird Sanctuary serves as a haven for diverse avian species, both resident and migratory. This study delves into the spatial distribution and residential dynamics of various avifaunal orders within the sanctuary, focusing on migratory bird species categorized by family. Through meticulous observation and data analysis, this research elucidates the intricate patterns of migration and residency, offering valuable insights into the sanctuary's ecological balance. By examining the distribution of species across different avian families, this study aims to enhance our understanding of biodiversity dynamics within the sanctuary. Such insights are crucial for effective conservation management strategies, facilitating the preservation of critical habitats and fostering the sanctuary's role as a sanctuary for avian diversity conservation

Keywords: Bhindawas Bird Sanctuary, avifaunal species, migratory birds, residential status, habitat, conservation, biodiversity, orders, families, ecological dynamics, migration patterns, sanctuary, avian diversity, habitat protection, data collection, observation, conservation strategies.

Introduction

The Bhindawas Bird Sanctuary, located in the state of Haryana, India, stands as a sanctuary of biodiversity, particularly renowned for its avian inhabitants. As a crucial haven for numerous avifaunal species, the sanctuary provides an invaluable opportunity to study the dynamics of bird populations, both resident and migratory. This study focuses on examining the spread and residential status of avifaunal species belonging to several orders within the sanctuary, with a specific emphasis on migratory bird species categorized by family. By systematically

investigating the distribution and behavior of these birds, we aim to unravel the intricate patterns underlying their residency and migration cycles. Understanding the factors influencing the presence and movements of avian populations within the sanctuary is pivotal for effective conservation management. Moreover, by categorizing migratory bird species according to their familial associations, we can gain deeper insights into the ecological roles played by different bird taxa within this unique ecosystem. This research endeavors to contribute valuable knowledge towards the conservation and management of the Bhindawas Bird Sanctuary, ultimately ensuring the preservation of its rich avian diversity for generations to come.

Objectives of the Study

Below is a breakdown of potential objectives based on the given information:

1. Identification of Avifaunal Species:
2. Distribution and Spread:
3. Residential Status of Migratory Bird Species:
4. Family-wise Classification:
5. Community Engagement and Education:

Scope and Organization of the Study

The spread of several orders' avifaunal species and the residential status of migratory bird species at the Bhindawas Bird Sanctuary are structured to provide a comprehensive understanding of avian diversity and behavior within the sanctuary's ecosystem. The study will encompass a thorough examination of avifauna belonging to various orders, focusing on their distribution patterns and migratory behaviors. To organize this vast dataset effectively, the study will categorize bird species by family, facilitating a systematic analysis of their residency status and seasonal movements. By dissecting the avian population into families, the research aims to identify prevalent trends in migratory behavior and residency preferences among different taxonomic groups. This approach will enable a nuanced exploration of how factors such as habitat availability, climatic conditions, and interspecific interactions influence the distribution

and abundance of avian species within the sanctuary. Through meticulous organization and analysis, the study endeavors to contribute valuable insights into avian ecology and conservation strategies tailored to the unique dynamics of the Bhindawas Bird Sanctuary.

Bhindawas Bird Sanctuary:

The Bhindawas Bird Sanctuary, located in the Jhajjar district of Haryana, India, is a haven for avian biodiversity. Spanning over 1000 hectares, this sanctuary is primarily known for its significance as a stopover and wintering site for migratory birds. The sanctuary encompasses a diverse range of habitats including marshes, wetlands, and grasslands, providing a rich environment for various bird species. It serves as a crucial resting and breeding ground for both resident and migratory birds, attracting thousands of winged visitors annually. With its tranquil surroundings and abundant food resources, the Bhindawas Bird Sanctuary offers a unique opportunity for birdwatchers, researchers, and nature enthusiasts to explore and appreciate the wonders of avian life. Efforts towards conservation and habitat preservation are essential to safeguard the sanctuary's ecological integrity and ensure the continued survival of its avian inhabitants.

Identification of Avifaunal Species:

The Bhindawas Bird Sanctuary, located near Jhajjar district in the state of Haryana, India, is known for its diverse avifauna. While the specific species present may vary depending on the time of year and environmental conditions, here are some of the bird species commonly found in the Bhindawas Bird Sanctuary:

1. **Sarus Crane (*Grus antigone*):** The sanctuary is particularly famous for being a habitat for these majestic birds, which are the tallest flying birds in the world.
2. **Painted Stork (*Mycteria leucocephala*):** These large wading birds with striking plumage can often be seen in and around the wetland areas of the sanctuary.
3. **Black-necked Stork (*Ephippiorhynchus asiaticus*):** Another striking stork species found in the sanctuary, characterized by its black and white plumage and long, sturdy bill.
4. **Indian Peafowl (*Pavo cristatus*):** The national bird of India, peafowls are commonly seen in the sanctuary, especially in the wooded areas.

5. **Indian Roller (*Coracias benghalensis*):** With its vibrant blue plumage and distinctive rolling flight, this bird is a common sight in open areas within the sanctuary.
6. **Common Teal (*Anas crecca*):** These small dabbling ducks are often seen in the wetland areas, particularly during the winter months.
7. **Northern Pintail (*Anas acuta*):** Another species of duck commonly found in the sanctuary, particularly in the winter season.
8. **Eurasian Wigeon (*Anas penelope*):** These dabbling ducks are migratory visitors to the sanctuary, often seen in the wetland areas during the winter months.
9. **Black-winged Stilt (*Himantopus himantopus*):** These elegant wading birds with long, slender legs can often be seen foraging in shallow waters within the sanctuary.
10. **Purple Heron (*Ardea purpurea*):** With its distinctive purple-grey plumage and long neck, this heron species can be spotted in the wetland areas of the sanctuary.

These are just a few examples of the diverse bird species that can be found in the Bhindawas Bird Sanctuary. Birdwatching enthusiasts visiting the sanctuary may also encounter numerous other species, making it a haven for birdwatching and nature enthusiasts alike.

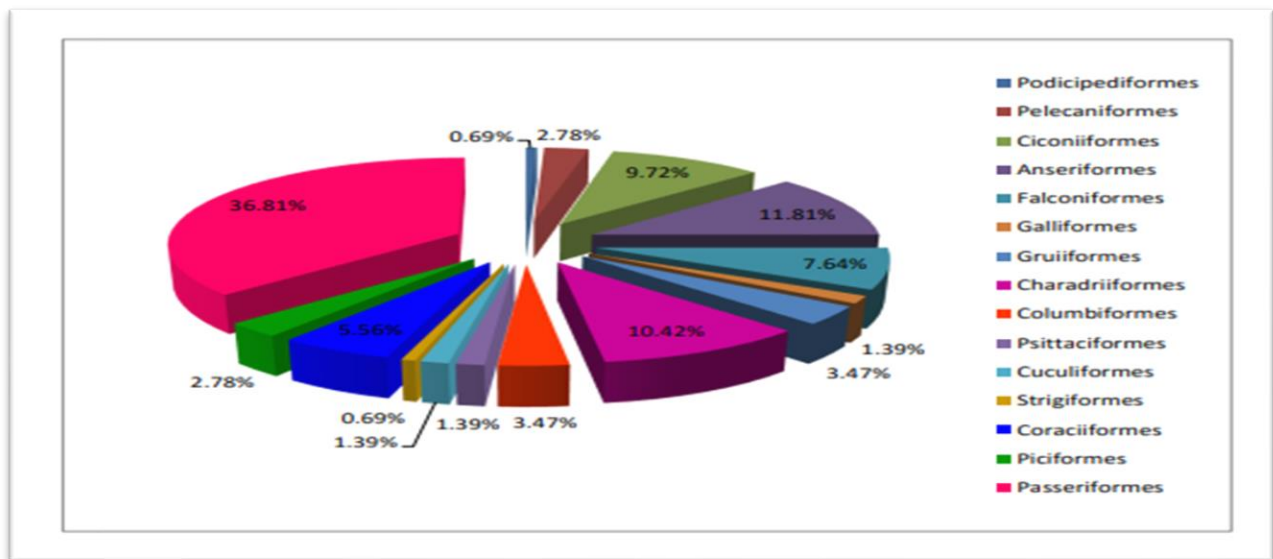


Fig. 1.1: Distribution (%) of avifaunal species from different orders at the Bhindawas Bird Sanctuary

Distribution and Spread

The distribution and spread of bird species at the Bhindawas Bird Sanctuary can vary depending on various factors such as seasons, habitat availability, and migratory patterns. Located in the Jhajjar district of Haryana, India, the sanctuary is spread over an area of approximately 1074 hectares, consisting of a reservoir, marshes, grasslands, and scrub forests. Here are some common bird species found in the sanctuary:

1. **Waterfowl:** Bhindawas Bird Sanctuary is known for hosting a variety of waterfowl species. This includes resident species like the Indian spot-billed duck, Northern pintail, common teal, and migratory species like the Northern shoveler, gadwall, and Eurasian wigeon.
2. **Waders:** Shorebirds or waders are also commonly seen in the sanctuary, especially around the reservoir and marshy areas. Species such as the black-winged stilt, common redshank, green sandpiper, and marsh sandpiper can be spotted here.
3. **Raptors:** Various raptor species inhabit or visit the sanctuary, including the Oriental honey-buzzard, black kite, marsh harrier, and occasionally the globally threatened species such as the white-rumped vulture and Indian vulture.
4. **Passerines:** The sanctuary provides habitat to several passerine species, including warblers, munias, finches, and buntings. Common examples include the common tailorbird, yellow-eyed babbler, purple sunbird, and Indian silverbill.
5. **Hérons and Egrets:** The wetlands and marshes of Bhindawas attract several heron and egret species such as the Indian pond heron, little egret, cattle egret, and grey heron.
6. **Migratory Species:** During the winter months, Bhindawas becomes a haven for migratory birds traveling from colder regions. These include species like the Siberian crane, greater flamingo, and various species of ducks, geese, and waders.

The distribution of these bird species within the sanctuary can vary based on factors such as water levels, availability of food, and disturbance levels. Visitors to the sanctuary can observe

these avian residents and migrants from designated viewpoints and walking trails within the sanctuary.

Residential Status of Migratory Bird Species:

The Bhindawas Bird Sanctuary, located in the Jhajjar district of Haryana, India, serves as a crucial habitat for various migratory bird species. These migratory birds visit the sanctuary during the winter months, seeking refuge from the harsh weather conditions in their breeding grounds. Some of the prominent migratory bird species found at the Bhindawas Bird Sanctuary include:

- 1. Siberian Crane (*Grus leucogeranus*):** This critically endangered bird species migrates from its breeding grounds in Siberia to various locations in India during the winter months, including the Bhindawas Bird Sanctuary.
- 2. Sarus Crane (*Grus antigone*):** The Sarus Crane is the tallest flying bird species and is found in various wetland habitats, including the Bhindawas Bird Sanctuary. It is known for its distinctive red head and gray plumage.
- 3. Bar-headed Goose (*Anser indicus*):** Known for its incredible high-altitude migration over the Himalayas, the Bar-headed Goose also visits wetlands like Bhindawas during the winter season.
- 4. Common Teal (*Anas crecca*):** These small dabbling ducks migrate from their breeding grounds in Europe and Asia to wintering sites in South Asia, including the Bhindawas Bird Sanctuary.
- 5. Northern Pintail (*Anas acuta*):** Another dabbling duck species, the Northern Pintail migrates from its breeding grounds in northern Eurasia to various wintering sites, including wetlands like Bhindawas.
- 6. Eurasian Wigeon (*Anas penelope*):** These medium-sized dabbling ducks breed in northern Europe and Asia and migrate to warmer regions, such as India, during the winter months.

7. **Northern Shoveler (*Anas clypeata*):** With its distinctive large spatula-shaped bill, the Northern Shoveler is a common winter visitor to wetlands across India, including the Bhindawas Bird Sanctuary.
8. **Common Pochard (*Aythya ferina*):** This diving duck species breeds across Europe and Central Asia and migrates to South Asia during the winter months, where it can be spotted in wetlands like Bhindawas.

These are just a few examples of the migratory bird species that find sanctuary at Bhindawas during the winter season. The presence of these birds underscores the importance of preserving and protecting such wetland habitats for the conservation of avian biodiversity.

Table 1.1. Speculative migratory schedule of some migratory bird species recorded at research areas

Bird Species	Arrival	Departure
Black-necked Stork	November	March
Glossy Ibis	September	April
Glossy Ibis	September	April
Lesser Whistling-Duck	June	August
Greylag Goose	November	March
Bar-headed Goose	November	February
Brahminy Shelduck	January	February
Comb Duck	January	February
Comb Teal	August	December
Gadwall	October	March
Eurasian Wigeon	December	March
Mallard	January	February
Northern Shoveller	November	March
Northern Pintail	December	March
Garganey	December	March

Common Teal	December	February
Common Pochard	December	March
Ferruginous Pochard	December	March
Tufted Pochard	December	March
Common Moorhen	September	April
Common Coot	October	April
Pheasant-tailed Jacana	May	September
Little Ringed Plover	December	April
White-tailed Lapwing	December	January
Marsh Sandpiper	September	April
Green Sandpiper	September	April
Wood Sandpiper	September	April
Spotted Redshank	September	April
Common Redshank	September	April
Little Stint	November	April
Tenmick's Stint	December	March
Pied Avocet	September	January
Lesser Pied Kingfisher	December	March
White Wagtail	September	April
Citrine Wagtail	October	April
Yellow Wagtail	October	April
Grey Wagtail	November	March
White-eared Bulbul	November	March
Blue Throat	November	March
Black Redstart	December	February

Family-wise Classification:

Family-wise classification of bird species at the Bhindawas Bird Sanctuary provides a comprehensive understanding of the avian diversity within its ecosystem. This classification

system categorizes bird species into various families based on their morphological and behavioral characteristics. At Bhindawas Bird Sanctuary, numerous families of birds are represented, including but not limited to Accipitridae (hawks, eagles), Ardeidae (herons, egrets), Anatidae (ducks, geese), and Charadriidae (plovers, sandpipers). Each family contributes to the sanctuary's ecological balance and plays a vital role in maintaining the biodiversity of the region. By studying these families, researchers and conservationists gain insights into the interconnectedness of species within the sanctuary, aiding in effective management and preservation efforts. Additionally, family-wise classification serves as a valuable tool for educational purposes, enabling visitors to appreciate the richness of avian life and fostering a deeper connection to nature.

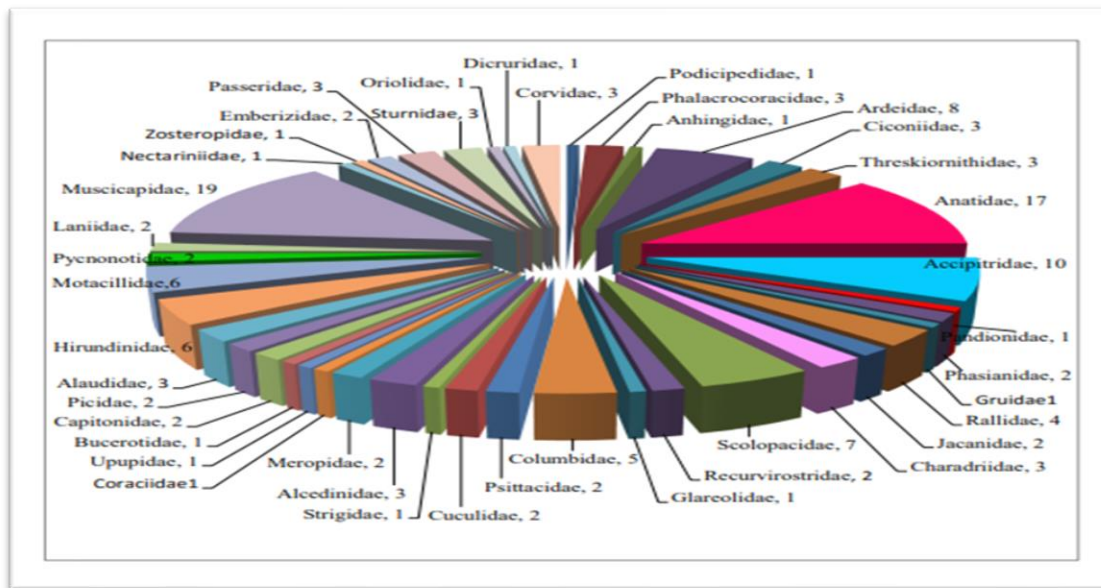


Fig. 1.2: Distribution (%) of avifaunal species from different families at the Bhindawas Bird Sanctuary

Community Engagement and Education

Community engagement and education play pivotal roles in fostering environmental awareness and conservation efforts, particularly in sanctuaries like Bhindawas Bird Sanctuary. Located in the heart of Haryana, India, this sanctuary boasts a diverse array of bird species, making it a

haven for avian enthusiasts and researchers alike. Through community engagement initiatives, locals are not only encouraged to visit and appreciate the sanctuary's natural beauty but also to actively participate in its preservation. Educational programs organized within the sanctuary provide valuable insights into the importance of bird conservation, highlighting the ecological significance of each species inhabiting the area. Among the myriad bird species found here, including migratory and resident birds such as the Indian roller, painted stork, and black-necked stork, community members learn about their habitats, behaviors, and the threats they face. By fostering a sense of stewardship and environmental responsibility, community engagement and education initiatives contribute significantly to the protection and sustainability of the Bhindawas Bird Sanctuary, ensuring its continued vitality for generations to come.

To carry out successful research in the designated areas the data was collected from 4 different habitats, i.e., wetland area, roadside data and periphery of lake, agricultural fields and fallow land. And from the roadside, vegetation along the roadside, electrical wires and the periphery of the lake a total of seventy-six bird species were noted down while from wetland area sixty-four bird species were recorded.

From the agricultural field total of thirty-four bird species were noted down and from the fallow land twenty-three bird species were recorded. The majority of the bird species, i.e., forty-six belonged to order Passeriformes and distributed into thirteen families. The second most dominant order was Anseriformes with seventeen avifaunal species which all belongs to one family Anatidae; this is followed by order Charadriiformes with fifteen avifaunal species which together belonged to 5 families, viz., Jacanidae, Charadriidae, Scolopacidae, Recurvirostridae and Glareolidae; In order Ciconiiformes fourteen avifaunal species were recorded and they belongs to three families, namely, Ardeidae, Ciconiidae and Threskornithidae; Further, the order Falconiformes was investigated and found that it has ten avifaunal species which further belongs to two families. i.e., Accipitridae and Pandionidae; Coraciiformes found to have eight avifaunal species falling into five families; Gruiformes and Columbiformes re having five each; Pelecaniformes with 4 avifaunal species; Piciformes with three avifaunal species whereas, order Galliformes, Psittaciformes and Cuculiformes have only two avifaunal species each.

Only one avifaunal species was recorded for each of the order Podiciformes and Strigiformes. From all the reported avifaunal species, fifty-six were reported to be the water birds, while the rest were i.e., seventy-nine avifaunal species were water associated bird species. For fulfilling the objective of seasonal variation, the recorded data was checked for season wise variations, on the basis of their presence or absence in different seasons of the year. The available data showed that the majority number i.e., ninety-four avifaunal species were winter season birds. This value is followed by the autumn season birds i.e., eighty-four. A little lesser were observed in summer i.e., eighty only. While the least were noted down in monsoon season i.e., sixty-two in number.

Table 1.2. Residential Status of recorded avian fauna family-wise in Bhindawas Bird Sanctuary

FAMILY	RESIDENTIAL STATUS			Total
	R	WM	SM	
Podicipedidae	1	0	0	1
Phalacrocoracidae	3	0	0	3
Anhingidae	1	0	0	1
Ardeidae	8	0	0	8
Ciconiidae	2	1	0	3
Threskiornithidae	1	2	0	3
Anatidae	1	14	2	17
Accipitridae	8	1	0	9
Pandionidae	0	1	0	1
Phasianidae	2	0	0	2
Gruidae	1	0	0	1
Rallidae	2	2	0	4
Jacaniidae	0	0	2	2
Charadriidae	1	2	0	3
Scolopacidae	0	7	0	7

Recurvirostridae	1	1	0	2
Glareolidae	1	0	0	1
Columbidae	5	0	0	5
Psittacidae	2	0	0	2
Cuculidae	1	0	1	2
Strigidae	1	0	0	1
Alcedinidae	2	1	0	3
Meropidae	1	0	1	2
Coraciidae	1	0	0	1
Upupidae	1	0	0	1
Bucerotidae	1	0	0	1
Capitonidae	1	0	0	1
Picidae	2	0	0	2
Alaudidae	2	0	0	2
Hirundinidae	5	0	0	5
Motacillidae	2	3	0	5
Pycnonotidae	1	1	0	2
Laniidae	1	0	0	1
Muscicapidae	12	6	0	18
Nectariniidae	1	0	0	1
Zosteropidae	1	0	0	1
Emberizidae	1	0	0	1
Passeridae	3	0	0	3
Sturnidae	3	0	0	3
Dicruridae	1	0	0	1
Corvidae	3	0	0	3

Conclusion

The avifaunal species at the Bhindawas Bird Sanctuary represent a diverse array of families, each with its unique characteristics and ecological significance. Through a meticulous examination of the residential status of migratory bird species across various orders, it becomes evident that the sanctuary serves as a vital habitat for both resident and migratory avian populations. The conclusion drawn from the spread of these species within different families underscores the sanctuary's importance as a haven for avian biodiversity. It highlights the critical role it plays in providing refuge and sustenance for numerous species throughout the year. By understanding the distribution patterns of these birds, conservation efforts can be tailored to address specific needs and challenges faced by each family. Overall, the Bhindawas Bird Sanctuary stands as a testament to the necessity of preserving natural habitats to safeguard the rich tapestry of avian life for generations to come.

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