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Seasonal bird's diversity of gautala reserve forest, Maharashtra, India

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Abstract

Birds are the most numerous, varied, and mobile living organisms on the planet. Birds are among the most effective environmental monitors. Birds have played a unique role in the protection, growth, and restoration of natural environments, and as a result, their significance and importance in the preservation of clean and healthy environments are of the highest order. Birds are a natural part of the Indian Subcontinent's habitation, which is teeming with winged residents. The diversity of bird populations is an important indicator of an ecosystem's overall well-being. The study is being carried out to compile a preliminary checklist of the bird community in the Gautala reserve forest. A total of 71 bird species from 38 families were identified. There were 62 resident birds, 7 winter migratory birds, one breeding migratory bird, and one non-resident bird. One species classified as Near Threatened (NT- Decreasing), such as the Alexandrine parakeet, the surviving 35 species are LC- Stable, 11 are LC- Unknown, 15 are LC- Increasing, and 10 are LC- Decreasing as per the International Union for Conservation of Nature (IUCN). The Passeriformes order was the highest abundance with 37 species in the Gautala Reserve Forest. In the present study, A bird survey was conducted in Gautala Reserve Forest selected 15 different Spots during the rainy, winter, and summer seasons and a checklist was created (2017-2018) to determine the status of the bird population in a region This paper discusses seasonal Variations in Birds counts in addition to the statistical analysis methods.

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Introduction

The pioneering work carried out in the field of ornithology in the Indian Subcontinent (Ali, 1996). Birds have played a unique role in the protection, expansion, and the restoration of natural environments, and as a result, their importance and significance in the preservation of healthy and clean environments are of the highest order. Information about birds can truly be made public in ornithological conservation efforts (Bock, 1997). Birds are the world's most numerous, diverse, and mobile living organisms. Birds are among the most effective environmental monitors. There are several reasons why birds act as an indicator of biodiversity (Harisha and Hosetti, 2009). Bird populations are sensitive indicators of pollutants in both terrestrial and aquatic ecosystems. The first birds are thought to have appeared around 140 million years ago, near the end of the Jurassic Period (Stanley and Steven, 1986; Nalavade, 2013).

The most significant element in the food chain, birds are vulnerable to changes in the natural and man-made environments. Birds are classified as Endangered, Threatened, Vulnerable, Rare, or Extinct due to a variety of threats. The native populations of various species, particularly in areas of drastic change in land use patterns, deforestation for various purposes, and other human activities, such as industrial systems, mining, and river valley projects, have harmed on several habitats. As a result, several species' populations have declined, resulting in their native extirpation or extinction (Sodhi, 2004). Birds are an important part of the Indian subcontinent's natural habitat, which is teeming with winged inhabitants. There may be no off-season for birds in India (Ghorade *et al.*, 2014). Tropical forest birds are the most vulnerable to deforestation (Brook, 2003). One of the major causes of bird population decline is habitat destruction. 16 million hectares of woodland are destroyed every year. In the face of dynamic tropical forests' exceptionally high species diversity and endemism. (Achard *et al.*, 2002). Previous studies of wetland bird groups in India revealed that birds are excellent indicators of water superiority due to their recreational, beauty, and commercial importance (Harisha and Hosetti, 2009; Bilgrami, 1995; Gupta *et al.*, 2011). Birds are an important animal group in an ecological system that play a functional role in the ecology and are thus referred to as bioindicators (Shelke, 2019). The current paper is focused on the seasonal bird diversity in the Gautala reserve forest.

Materials and methods

The Gautala reserve forest is rich in bird diversity, including many migratory bird species, and has been identified as an ecologically significant landmark on the regional map. The study on bird habits, habitat, number, and seasonality was conducted through regular field visits to the Gautala reserve forest in the mornings between 7:30 and 10:30 a.m. during the study period 2017-2018. Binoculars with a magnification of 8 × 30 were used to observe the birds. The characteristics of residential and non-residential birds, as well as their routine and habitat, as well their seasonal dominance were studied. The identification and checklist of identified birds were made in winter, summer, and monsoon seasons and photographed with a DSLR camera Canon EOS 200D, lenses used 18-55 mm and 55-250 mm (Ali, 1996).

The current Gautala reserve forest is 72 kilometers from Aurangabad. The sanctuary is surrounded by the Ajanta satmala ranges and is located at 74°-55° and 75°-15° east longitude and 20°-15° and 20°-30° north latitude (Fig. 1&2). A protected forest named the "Gautala Autramghat Wildlife Sanctuary" preserves the name of Gautama Rishi, an Indian monk, and the nearby minimal town of Gautala. A Gautala Autramghat wildlife sanctuary was established in 1986 by the Maharashtra government, in accordance with the Wildlife Protection Act of 1972. Identification and monitoring of different ecological aspects of bird, diversity, particularly local and migratory birds, have been undertaken in the current study at Gautala reserve forest for future planning.

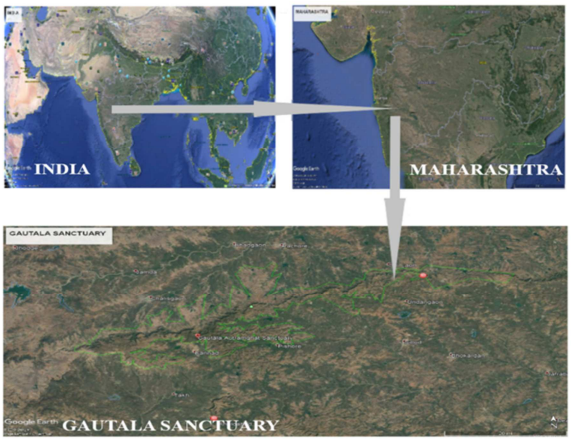

Fig. 1. Map of the Study area (Mirza *et al.*, 2021, 2022 and 2023)

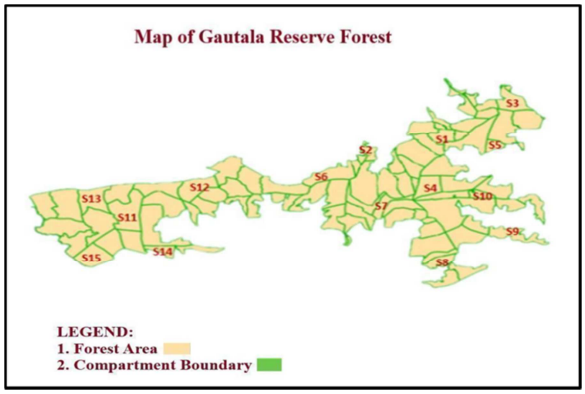

Fig. 2. Study area with selected spots (Mirza *et al.*, 2021, 2022 and 2023)

The average annual precipitation is around 550-600 mm. The temperature reaches 45 °C in the summer and 8 °C in the winter. Gautala Sanctuary is well-known for its well-known flora of medicinal plants, trees, and herbs, among other things, that are grown in natural conditions (Mirza *et al.*, 2021 and 2022).

Bird survey and monitoring

Birds are sampled using the line transect method, the point counting method, and opportunistic bird sightings. In consultation with ornithologists, species were identified using vocal sounds and bird photographs.

Point counts

In this method, the observer will remain at a point for 5 minutes while a randomly selected bird's visa or listened to within a radius of 5 m is recorded. This observation is repeated at a different location at least 100 meters away from the first.

Opportunistic bird sightings

Many species of birds will be detected during the investigation's journey to the study area. These species are noted for their appearance or call. The presence or absence of a species, or some measure of abundance, can be used to express its distribution. The sample units could be on a regular grid, as in most bird atlas studies, or they could be a random point within a habitat where data was collected. There are three types of animal species and community distributions; random distributions, which are spread independently of ground features and the presence of other birds.

Furthermore, the resources that birds use are rarely and randomly distributed (Auti, 2002). Fifteen sampling stations were selected by using systematic sampling within the reserve forest area. To ensure correct pacing, a GPS receiver (Garmin GPS map 76CSx, Garmin) was used.

Identification

Field guides (described above) and standard keys are used for species identification. The specialists' laboratories (The Department of Environmental Science at the Dr. Babasaheb Ambedkar Marathwada University, Aurangabad).

Statistical analysis

To analyze the seasonal variations in Birds Counts were determined for each season. R' Studio Software was used for statistical and qualitative data analysis.

Descriptive analysis method

This method was used to analyze the bird diversity of the Gautala Reserve Forest. There is used software presently selected method for Descriptive Analysis computation used to describe the features of data of birds' diversity and shows or summarizes data in the form of tables, charts, and graphs. The descriptive analysis process was summarizing the insights from the collection of the data on birds' diversity through statistical techniques. It is one of the popular methods for the effective analysis of

data on birds' diversity. Descriptive analysis uses a variety of methods, including:

Frequency distribution

It describes the dispersion of categories by counting and calculating the proportion of a specific group of observed birds. It propositions an investigation of the data's dispersal range.

Measures of central tendency

The terms mean, mode, and median are normally used to term the midpoint of the records for the group of birds' diversity. One can determine the average records value by using the central tendency.

Measures of dispersion

Dispersion measures are used to assess the variation in birds' diversity data. The two most standard metrics used to term the dispersal of birds diversity data are variance and standard deviation.

Equations

A number of different averages existed, including the arithmetic mean. Consider the formula for the arithmetic mean.

$$\mu=\sum xN\mu=\sum x \quad (1)$$

Where,

μ is the population mean,

x is the sample means,

∑x ∑x, and then divide by the number of bird species, N.

To reveal this, the mean equation can also be written as follows:

$$\mu=\sum fi(xi)N\mu=\sum fi(xi)N \quad (2)$$

Where,

f_i denotes the frequency of population members with the value x_i.

The shannon-wiener index of diversity

The Shannon-Wiener Index was used to distinguish the *α*- diversity of bird species at Gautala forest kind levels in sequence to identify the species diversity of Birds of each precise habitation (Barens *et al.*, 1998).

$$H = -\sum[(pi) \times \ln(pi)] \quad (3)$$

Where,

pi, Divide the number of individuals of species i by the total number of samples to get the percentage of the total sample that species i represents.

S: Number observed Bird species.

Results

In the present study, A bird survey was conducted in Gautala Reserve Forest selected 15 different Spots during the rainy, winter, and summer seasons, and a checklist was created (2017-2018) to conclude the position of the bird populace in a zone. A total of 71 detected bird species from 38 families were documented. These 38 distinct families are described in detail as follows: The following are the 38 bird families found in the Gautala forest area. Gautala Reserve forest has a diverse bird fauna, including Accipitridae, Aegithinidae, Alcedinidae, Alaudidae, Ardeidae, Apodidae, Bucerotidae, Campephagidae, Casuariidae, Charadriidae, Cisticolidae, Columbidae, Corvidae, Cuculidae, Dicruridae, Estrildidae, Emberizidae, Hirundinidae, Laniidae, Leiotrichidae, Meropidae, Megalaimidae, Monarchidae, Motacillidae, Muscicapidae, Nectariniidae, Paridae, Passeridae, Phasianidae, Picidae, Ploceidae, Psittacidae, Pycnonotidae, Rhipiduridae, Sturnidae, Tytonidae, Upupidae, Zosteropidae (Table 1).

The birds were divided into four categories: A- Abundant, C- Common, U- Uncommon, and Rr- Rare. Furthermore, the birds' status was classified as R- Resident, a species seen throughout the year in the study area, W- Winter Visitor, a species only seen during the winter, PM - Passage Migrant, a species seen on their way from their native habitat to their breeding grounds, and IR- species whose status information is required or unclear (Fig. 4). There are different 14 Orders of Birds fauna of Gautala Reserve forest such as Accipitriformes, Bucerotiformes, Caprimulgiformes, Charadriiformes, Cuculiformes, Coraciiformes, Columbiformes, Galliformes, Passeriformes, Pelecaniformes, Piciformes, Psittaciformes, Struthioniformes, and Strigiformes.

Table 1. List of orders of bird species of gautala reserve forest

Sl	Birds name	Order
1.	Shikra, Sparrow hawk, Black-winged kite, Black kite.	Accipitriformes
2.	Indian Grey Hornbill, Common Hoopoe.	Bucerotiformes
3.	House Swift.	Caprimulgiformes
4.	Red-wattled Lapwing, Yellow-wattled Lapwing.	Charadriiformes
5.	Koel, Common Hawk-cuckoo.	Cuculiformes
6.	Green Bee-eater, Lesser Pied kingfisher, White-breasted Kingfisher, Blue-tailed Bee-eater, Small Blue Kingfisher.	Coraciiformes
7.	Green-pigeon, Blue Rock Pigeon, Collared-dove, Little Brown Dove.	Columbiformes
8.	Jungle Bush-quail, Indian Peafowl, Grey Partridge.	Galliformes
9.	Common Iora, Brahminy Myna, Pied Myna, Chestnut-tailed Starling and Common Myna, White-browed Fantail Flycatcher, Red-vented Bulbul, Baya Weaver, Yellow-throated Sparrow, House Sparrow, Great Tit, Purple Sunbird, Oriental Magpie-robin, Indian Robin, Pied Bushchat, Tickell's Blue-flycatcher , Grey Wagtail, Citrine Wagtail, White-browed Wagtail, Indian Paradise-flycatcher, Common Babbler, brown shrike, long-tailed shrike, Bay-backed Shrike, Great Grey Shrike, Dusky Crag Martin, Crested Bunting, White-throated Munia, White-bellied Drongo, Black Drongo, Rufous Treepie, House Crow, Common Tailorbird, Ashy Wren Wrabbler, Common Emu, Scarlet Minivet, Ashy-crowned Sparrow-lark, Common Iora.	Passeriformes
10.	Indian Pond Heron, Black-Crowned Night Heron, Cattle Egret, Little Egret.	Pelecaniformes
11.	Crimson-breasted Barbet, Marath Woodpecker.	Piciformes
12.	Alexandrine Parakeet, Rose-ringed Parakeet.	Psittaciformes
13.	Common Emu.	Struthioniformes
14.	Barn-owl.	Strigiformes

Table 2. List of observed bird's species of gautala reserve forest

Sl	Scientific name	Common local name	Status	Abundance	IUCN status and current population trend
Family- Accipitridae					
1.	*Accipiter badius*	Shikra	R	C	LC- stable
2.	*Accipiter nisus*	Sparrow hawk	W	Rr	LC- stable
3.	*Elanuscaeruleus vociferous*	Black winged kite	R	C	LC- stable
4.	*Milvus migrans*	black kite	R	C	LC-unknown
Family- Aegithinidae					
5.	*Aegithina tiphia*	Common Iora	R	C	LC-unknown
Family- Alcedinidae					
6.	*Alcedo atthis*	Small blue kingfisher	W	C	LC-unknown
7.	*Ceryle rudis*	Lesser pied kingfisher	R	C	LC-unknown
8.	*Halcyon smyrnesis*	White breasted kingfisher	R	C	LC-increasing
Family- Alaudidae					
9.	*Eremopterix grisea*	Ashy-crowned Sparrow-lark	R	C	LC- stable
Family- Ardeidae					
10.	*Ardeola grayii*	Indian Pond Heron	R	C	LC-unknown
11.	*Nycticorax nycticorax*	Night Heron	R	U	LC-decreasing
12.	*Bubulcus ibis*	Cattle Egret	R	C	LC-increasing
13.	*Egretta garzetta*	Little Egret	R	C	LC-increasing
Family- Apodidae					
14.	*Apus affinis*	House swift	R	C	LC-increasing
Family- Bucerotidae					
15.	*Ocyceros birostris*	Grey Hornbill	R	C	LC- stable
Family- Campephagidae					
16.	*Pericrocotus cinnamomeus*	Scarlet minivet	R	C	LC- stable
Family- Casuariidae					
17.	*Dromaius novaehollandiae*	Common Emu	IR	Rr	LC-stable
Family- Charadriidae					
18.	*Vanellus indicus*	Red wattled lapwing	R	C	LC-unknown
19.	*Vanellus malabaricus*	Yellow wattled lapwing	R	C	LC- stable
Family- Cisticolidae					
20.	*Prinia socialis*	Ashy wren wrabbler	R	C	LC- stable
21.	*Orthotomus sutorius*	Common Tailor bird	R	C	LC- stable
Family- Columbidae					
22.	*Treron phoenicopterus*	Green pigeon	R	C	LC-increasing
23.	*Columba livia*	Blue rock pigeon	R	C	LC-decreasing
24.	*Streptopelia decaocto*	Collared dove	R	U	LC-increasing

25. *Streptopelia senegalensis*	Little brown dove	R	C	LC- stable
Family- Corvidae				
26. *Corvus splendens*	House crow	R	C	LC- stable
27. *Dendrocitta vagabunda*	Rufous treepie	R	C	LC-decreasing
Family- Cuculidae				
28. *Eudynamys scolopaceus*	Koel	R	C	LC- stable
29. *Hierococcyx varius*	Common hawk-cuckoo	R	C	LC-stable
Family- Dicruridae				
30. *Dicrurus macrocercus*	Black drongo	R	C	LC- unknown
31. *Dicrurus caerulescens*	White-bellied drango	R	C	LC-unknown
Family- Estrildidae				
32. *Eurydice malabarica*	White throated munia	R	C	LC- stable
Family- Emberizidae				
33. *Melophus lathami*	Crested bunting	R	C	LC- stable
Family- Hirundinidae				
34. *Hirundo concolor*	Dusky crag martin	R	C	LC-increasing
Family- Laniidae				
35. *Lanius excubitor*	Great Grey shrike	R	C	LC-decreasing
36. *Lanius vittatus*	Bay-backed shrike	R	C	LC- stable
37. *Lanius schach*	Long-tailed shrike	R	C	LC-unknown
38. *Lanius cristatus*	Brown Shrike	W	U	LC-decreasing
Family- Leiotrichidae				
39. *Turdoides caudatus*	Common babbler	R	C	LC- stable
Family- Meropidae				
40. *Merops orientalis*	Green bee-eater	R	C	LC-increasing
41. *Merops philippinus*	Blue-tailed Bee-eater	PM	Rr	LC- stable
Family- Megalaimidae				
42. *Megalaima haemacephala*	Crimson breasted barbet	R	C	LC-increasing
Family- Monarchidae				
43. *Terpsiphone paradise*	Indian Paradise flycatcher	R	U	LC- stable
Family- Motacillidae				
44. *Motacilla maderaspatensis*	White-browed Wagtail	R	C	LC-stable
45. *Motacilla citreola*	Citrine Wagtail	W	U	LC-increasing
46. *Motacilla cinerea*	Grey Wagtail	W	C	LC-stable
47. *Motacilla flava*	Yellow wagtail	W	C	LC-decreasing
Family- Muscicapidae				
48. *Cyornis tickelliae*	Tickell's Blue-flycatcher	R	C	LC- stable
49. *Saxicola caprata*	Pied bushchat	R	C	LC- stable
50. *Saxicoloides fulicatus*	Indian robin	R	C	LC- stable
51. *Copsychus saularis*	Oriental Magpie-robin	R	C	LC- stable
Family-Nectariniidae				
52. *Nectarinia asiatica*	Purple sunbird	R	C	LC- stable
Family- Paridae				
53. *Parus major*	Grey tit	R	C	LC-increasing
Family- Passeridae				
54. *Passer domesticus*	House sparrow	R	C	LC-decreasing
55. *Petronia xanthocollis*	Yellow throated sparrow	R	C	LC- stable
Family- Phasianidae				
56. *Perdicula asiatica*	Jungle bush quail	R	C	LC- stable
57. *Pavo cristatus*	Indian peafowl	R	C	LC- stable
58. *Francolinus pondicerianus*	grey partridge	R	C	LC- stable
Family- Picidae				
59. *Leiopicus mahrattensis*	Marath woodpecker	R	C	LC- stable
Family- Ploceidae				
60. *Ploceus philippinus*	Baya weaver	R	C	LC- stable
Family- Psittacidae				
61. *Psittacula eupatria*	Alexandrine parakeet	R	C	NT-decreasing
62. *Psittacula krameri*	Rose ringed parakeet	R	C	LC-increasing
Family- Pycnonotidae				
63. *Pycnonotus cafer*	Red-vented bulbul	R	C	LC-increasing
Family- Rhipiduridae				
64. *Rhipidura aureola*	White browed fantail Flycatcher	R	C	LC- stable
Family- Sturnidae				
65. *Acridotheres tristis*	Common myna	R	C	LC-increasing
66. *Sturnia malabarica*	Chestnut-tailed starling	W	C	LC-unknown
67. *Sturnus contra*	Pied myna	R	C	LC-increasing

68. *Sturnus pagodarum* Family- Tytonidae	Brahminy myna	R	C	LC-unknown
69. *Tyto alba* Family- Upupidae	Barn owl	R	C	LC- stable
70. *Upupa epops* Family- Zosteropidae	Common Hoopoe	R	C	LC-decreasing
71. *Zosterops palpebrosus*	Oriental White eye	R	C	LC-decreasing

Note: C: Common, U: Uncommon, R: Resident (Breeds in India), Rr: Rare, W: Winter Visitor, PM: Passage Migrant, IR: species whose status information required or is not clear, LC: Least Concern, NT: Near Threatened (Grimmett, 1998).

These are the 14 Bird Orders present in the Gautala forest area (Table 1). The Passeriformes order was the highest abundance with 37 species in the Gautala Reserve Forest. The Ardeidae family has a large number of bird species, while the Zosteropidae family has fewer bird species than the other bird species families (Fig. 4). Spots 13 and 7 have a higher population density than the other spots. The total number of individuals in spot 6 is 540, which is very low in comparison to other spots (Fig. 5).

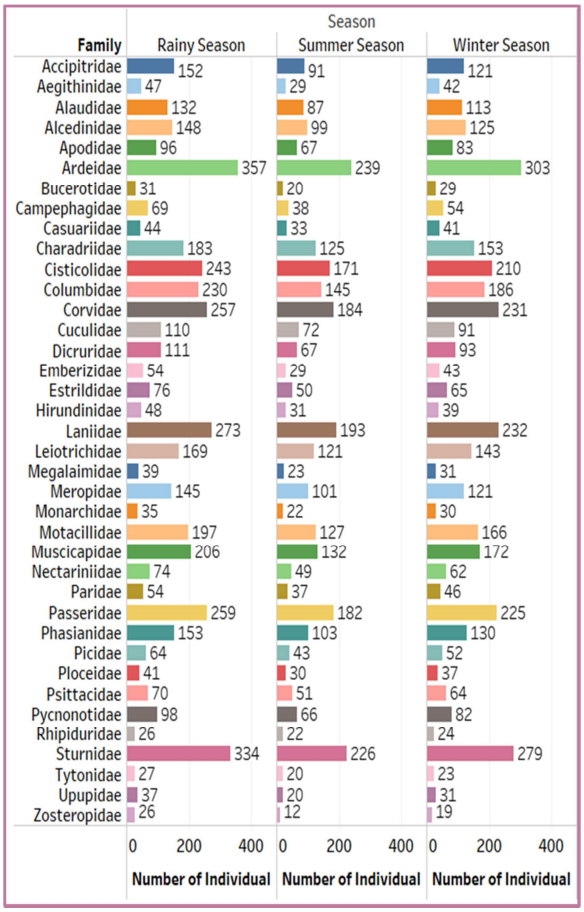

Fig. 3. Shows season wise the total number of species for different families in birds fauna

Fig. 4. The total number of species for different families in birds fauna

The total number of bird species recorded in the Gautala reserve forest area is 70, with 1 species belonging to the Near Threatened category (NT-Decreasing), such as the Alexandrine parakeet, the remaining 35 species are LC- Stable, 11 species are LC- Unknown, 15 species are LC- Increasing, and 10 species are LC- Decreasing as per the International Union for Conservation of Nature (IUCN) (Table 2). This shows the importance of protecting them, as well as all other habitats, to preserve the natural forest that surrounds them. The current status of bird species must be documented for future monitoring and conservation. A few of bird species shown in Fig. 6

Statistical analysis of observed bird fauna

In the current study, statistical patterns were used in descriptive analysis to describe observed bird species found in the Gautala reserve forest. The total number of individuals is very low during the summer season and

very high during the rainy season. The seasonal pattern is distributed by all of the bird families (Fig. 3).

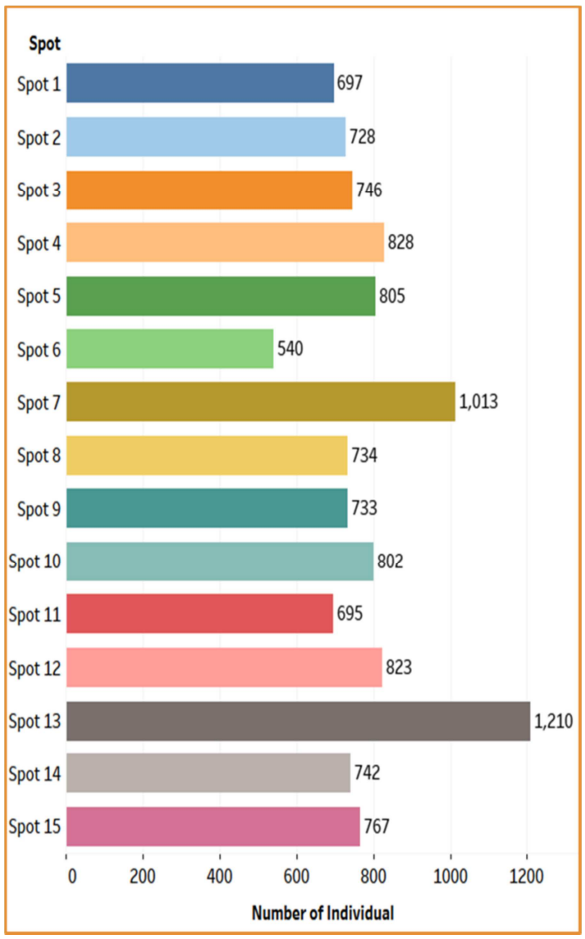

Fig. 5. Total number of species for different spots in the Birds fauna

Purple sunbird

Grey hornbill

Pied myna

Tickell's Blue-flycatcher

Small billied babbler

Pied robin

Fig. 6. Some photographs of observed bird species found in the gautala reserve forest

Discussion

In the Gautala reserve forest, 71 bird species from 14 orders and 38 families were identified during the current study. Seasonal families of bird species were termed, such as rainy, winter, and summer. In comparison to other seasons, bird counts are very high during the rainy season and very low during the summer. All of the families of birds follow a similar seasonal pattern. Passeriformes are the most numerous orders, with approximately 116 species, making it the dominant order was resulted (Mahanta *et al.*, 2022). The Muscicapidae family, which was eight species, with the highest abundance, followed by the Ardeidae and Sturnidae families (Deshmukh and Rudey, 2019). Zosteropidae species are rare in mature tree habitats but more common in young tree formations with dense vegetation recorded (Borghesio and Paola, 2004).

A species must overcome such barriers in order to spread to other preferred locations. Climate, topography, a lack of food and water resources, and other factors can all act as barriers. There are some factors that favour a species or group of species settling and sustaining in a territory. In other words, there are numerous factors that influence and impact the presence, absence, and abundance of a species in a given area. A thorough understanding of distributional patterns, as well as the factors that influence those patterns, is critical for the conservation and management of any organism, including birds (Nalavade, 2013). The Oussudu Lake wetland area in Puducherry is home to 166 bird species from 56 families. There were investigated the

waterbird family Ardeidae, A counting method was used to calculate the abundance value of birds. A greater diversity of birds was observed in the natural deciduous forest. The current investigation is comparable to this work (Firdausy *et al.*, 2021).

In the present study, the maximum number of bird species found in the Ardeidae family during the rainy season is 357, while the minimum number of bird species found in the Zosteropidae family is 26. The maximum number of bird species found in the Ardeidae family during the winter season is 303, while the minimum number of bird species found in the Zosteropidae family is 19. During the summer season, the maximum number of bird species found in the Ardeidae family is 239, while the minimum number of bird species found in the Zosteropidae family is 12. The total number of species in the Bird's fauna by season. This paper focuses on the seasonal changes in bird diversity within the Gautala reserve forest. Bird species' current status must be documented for future monitoring and conservation. In the statistical Analysis, there were used in descriptive analysis describes to season wise the total number of species from various bird families counted. The rainy season has more species than the other seasons for all types of birds observed, while the winter season has fewer.

Conclusion

The current study focused on faunal diversity, with a particular emphasis on birds, mammals, and reptiles. This study included 71 bird species classified into 14 orders and 38 families. The Ardeidae family has the highest number of bird species, whereas the Zosteropidae family comprises the least. The Passeriformes order has the most species in the Gautala Reserve Forest, with 37. Common Iora, Brahminy myna, Pied myna, Chestnut-tailed Starling, and Common Myna, White-browed Fantail flycatcher, Red-vented Bulbul, Baya Weaver, and Yellow-throated sparrow are the dominant species (Passeriformes) of observed Bird Species. House Sparrow, Great Tit, Purple Sunbird, Oriental Magpie robin, Indian Robin, Pied Bushchat, Tickell's Blue-flycatcher, Grey Wagtail, Citrine Wagtail, White-browed Wagtail, Indian Paradise-flycatcher, Common Babbler, brown shrike extant, long-tailed shrike, Bay-backed Shrike, Great Grey Shrike, Dusky Crag Martin, Crested Bunting, White White-bellied Drongo, Rufous Treepie, House Crow, Common Tailorbird, Ashy wren wrabbler, Common Emu, Scarlet Minivet, Ashy-crowned Sparrow-lark, Common Iora. One species i.e. the Alexandrine parakeet is Near Threatened (NT- Decreasing) among the total bird species recorded according to conservation IUCN status, while the remaining 70 species are all classified as Least Concerned. This emphasizes the significance of preserving them, as well as all other habitats, in order to conserve the natural forest that surrounds them. It is critical to record the current status of bird species for future monitoring and protection. Besides these, the results from the descriptive analysis method revealed that seasonal bird diversity. Overall, the present examination gives a baseline conclusion about seasonal bird counts. Also, the current study provides basic data on the various bird species that might currently be found in the Gautala Sanctuary. A checklist and status of Birds might play a significant role in the regional and local structure involved in the conservation of precious bird diversity for a superior and well-protected future.

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References

Achard F, Eva HD, Stibig HJ, Mayaux P, Gallego J. 2002. Determination of deforestation rates of the world's humid tropical forests. Science **297**, 999–1002.
https://doi.org/10.1126/science.1070656

Ali S. 1996. The book of Indian birds. Revised Edition. Mumbai: Bombay Natural History Society.

Analytics Steps. 7 types of statistical analysis: Definition & explanation. https://www.analyticssteps.com/blogs/7-types-statistical-analysis-definition-explanation

Auti RG. 2002. Seasonal variations in the water characteristics and macrofaunal distribution of Salim Ali Lake near Delhi Gate, Aurangabad. M.Sc. thesis, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

Barens BV, Zak DR, Denton SR, Spurr SH. 1998. Forest ecology. 4th ed. John Wiley and Sons Inc., 773 pp. ISBN 978-0471308225.

Bilgrami KS. 1995. Concept and conservation of biodiversity. CBS Publishers and Distributors, Delhi.

Bock CE. 1997. The role of ornithology in conservation of the American West. The Condor **99**(1), 1–6.

Borghesio L, Laiolo P. 2004. Habitat use and feeding ecology of Kulal White-eye *Zosterops kulalensis*. Bird Conservation International **14**, 11–24. https://doi.org/10.1017/S0959270903000000

Brook BW, Sodhi NS, Ng PKL. 2003. Catastrophic extinctions follow deforestation in Singapore. Nature **424**, 420–423. https://doi.org/10.1038/nature01795

Deshmukh GD, Rudey RJ. 2019. Preliminary survey of avifauna from agroforest ecosystem of Dev Talav, Nagbhid (Maharashtra), India. Journal of Global Biosciences **8**(6), 6290–6300. https://doi.org/10.1016/0169-5347(92)90126-V

Firdausy MS, Mardiastuti A, Aryati MY. 2021. The community of Ardeidae family and distribution of nest trees in Pulau Rambut Wildlife Sanctuary, Jakarta Bay, Indonesia.

Ghorade IB, Thakur VR, Patil SS. 2014. Diversity of avian fauna from Jaikwadi Reservoir at Paithan. European Academic Research **2**(2). ISSN: 2286-4822.

Grimmett R, Inskipp C, Inskipp T. 1998. Birds of the Indian Subcontinent. Christopher Helm, London.

Gupta MB, Vijayan L, Sandaliyan S, Sridharan N. 2011. Status of wetlands and wetland birds in Coimbatore, Trichy, Perambalore and Thiruvarur districts in Tamil Nadu, India. World Journal of Zoology **6**(2), 154–158.

Harisha MN, Hosetti BB. 2009. Diversity and distribution of avifauna of Lakkavalli range forest, Bhadra Wildlife Sanctuary, Western Ghats, India. Ecoprint **16**, 21–27. https://doi.org/10.3126/eco.v16i0.3469

LibreTexts. Introduction – Simpson's index and Shannon-Weiner index. https://stats.libretexts.org/Bookshelves/Applied_Statistics/Book%3A_Natural_Resources_Biometrics_(Kiernan)/10%3A_Quantitative_Measures_of_Diversity_Site_Similarity_and_Habitat_Suitability/10.01%3A_Introduction__Simpsons_Index_and_ShannonWeiner_Index

Mahanta N, Islam N, Barman R, Deka S, Borkataki U, Chhetri T, Basumatary S, Rahman M. 2022. A preliminary checklist of avian fauna from Raimona National Park of Assam, India. Applied Ecology and Environmental Sciences **10**(11), 652–664. https://doi.org/10.12691/aees-10-11-1

Mirza AN, Patil SS. 2021. Seasonal plant diversity of Gautala Reserve Forest, District Aurangabad. Applied Ecology and Environmental Sciences **9**(1), 92–100. https://doi.org/10.12691/aees-9-1-15

Mirza AN, Patil SS. 2022. Mapping of microbial diversity of Gautala Reserve Forest in Aurangabad (District) (M.S.), India. Applied Ecology and Environmental Sciences **10**(5), 303–310. https://doi.org/10.12691/aees-10-5-6

Mirza AN, Patil SS. 2023. Seasonal reptilian diversity at Gautala Reserve Forest, Aurangabad (Maharashtra), India. Current World Environment **18**(2). https://doi.org/10.12944/CWE.18.2.27

Nalavade SB. 2013. Conservation and sustainable management of avifaunal diversity in Northern Western Ghats, India: A geographical perspective. Thesis, Tilak Maharashtra Vidyapeeth, Pune. Guidance of Dr. Shrikant N. Karlekar.

Shelke AD. 2019. Bird diversity in and around the Hatale Dam, Taluka Chalisgaon, District of Jalgaon, Maharashtra. Journal of Emerging Technologies and Innovative Research **6**(3). ISSN 2349-5162.

Sodhi NS, Liow LH, Bazzaz F. 2004. Avian extinctions from tropical and subtropical forests. Annual Review of Ecology, Evolution, and Systematics **35**, 323–345.

Stanley SM. 1986. Earth and life through time. W.H. Freeman and Company, New York.

The IUCN Red List of Threatened Species. Available at: https://www.iucnredlist.org