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AVIFAUNAL DYNAMICS IN RELATION TO SEASONAL SHIFTS AND HABITAT CONDITIONS IN SITAKHANDI FOREST, NANDED DISTRICT, MAHARASHTRA

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Research Paper

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ABSTRACT

Sitakhandi Forest, a comparatively intact deciduous forest area in the Nanded district of Maharashtra, is close to Bhokar. It is notable for its variety of plants and a tiny trickle of water that runs among the rocks and trees. Its deciduous forests are well-known. The Nanded forest division considers it a 'hotspot' for plant diversity. There are distinctive bird fauna in this forest. In June 2022–May 2024, a thorough survey study was carried out to examine the avian fauna and the effects of the seasons on it. A total of 83 species from 15 orders and 27 families were found. Among them, 34 were resident common, 3 were resident migratory common, 3 were winter migratory, 9 were resident migratory uncommon, 8 were passage migratory rare, and others showed varying ecological statuses.

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Keywords: Sitakhandi forest, avian fauna, biodiversity, migratory birds.

INTRODUCTION

Birds are some of the most vital, elegant, and fascinating warm-blooded creatures capable of flight (Verma and Prakash, 2020). They hold great significance for human life. It is often said that while birds can survive without humans, the reverse would be much more challenging. Birds also provide considerable economic benefits. They regulate pest populations, act as natural cleaners, assist in pollination, contribute to seed distribution, and offer a valuable source of nutrition. Recognizing their crucial role in nature and human life, scientists have been studying birds for generations.

Environmental changes have a direct impact on biodiversity, which is often reflected through modeled data. Indicators of biodiversity are an essential component of tools used to evaluate the condition of habitats and ecosystems. The variety of bird species within an ecosystem serves as a strong indicator of its ecological health (Verma et al., 2015; John et al., 2022). Birds are frequently employed in environmental impact evaluations, and wetlands play an important role in sustaining ecological equilibrium (Donar *et al.*, 2012; Prakash and Verma, 2016; Arya, 2025). Ali (1936) pioneered the study of economic ornithology. Subsequently, Ali and Ripley (1983a & b) explored the bird diversity of Kerala in detail. Birds have also been utilized as ecological indicators to assess environmental health. Wadatkar and Kasambe (2002) identified 171 bird species in the Pohar-Malkhed

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Reserve Forest located in Amravati, Maharashtra. Yardi *et al.* (2004) observed 64 species at Salim Ali Lake in Aurangabad.

In the Nanded region, Kulkarni *et al.* (2005) recorded 151 species, while Kulkarni and Kanwate (2006) reported 18 species from the Dongarkheda Reservoir in Hingoli District, Maharashtra. Kulkarni et al. (2010) identified 62 species in the Jaldhara Forest, located in Kinwat, Nanded district. Balkhande et al. (2012) documented 53 bird species along the Godavari River near Dhangar Takli. Balkhande et al. (2012) recorded 50 bird species near the Purna River in Parbhani district.

Study Area

Satellite image of study area Sitakhandi Forest.

The Sitakhandi Forest is located in the Bhokar Taluka of Nanded district in the Marathwada region of Maharashtra, India. Geographically, it lies approximately between latitudes 19.6°N and 19.9°N, and longitudes 77.8°E and 78.0°E. The forest is accessible via the Bhokar town, situated about 5 kilometers to the west, and is well-connected by local roads. Covering an estimated area of approximately 35 to 50 square kilometers, Sitakhandi Forest comprises a mosaic of dry deciduous woodland, scrubland, and mixed forest patches interspersed with grasslands and agricultural edges. The region is part of the Deccan plateau and features gently undulating terrain with low hills and shallow seasonal streams. The topography is predominantly hilly, with elevations ranging from 350 to 450 meters above sea level.

MATERIALS AND METHODS

The study was conducted over two separate periods to ensure data accuracy and repeatability. Regular bimonthly observations were carried out from April to March, followed by a second phase from June to March for confirmation. Bird surveys were conducted using the Line Transect method (Gatson, 1973). Observations were made along fixed transects by trained observers. Bird sightings and calls were recorded at regular intervals using the Point Count method (Ralph et al., 1993). At each point, observers paused for 5–10 minutes and recorded all birds seen or heard within a standard radius.

Birds were identified in the field using standard field guides, primarily Grimmett et al. (1999) and Kazmierczak (2006). Species nomenclature followed the conventions set by Manakadan and Pittie (2001). To evaluate the impact of seasonal variation on bird diversity and abundance, the year was divided into three distinct seasons: Summer (March–June), Monsoon (July–October), and Winter (November – February).

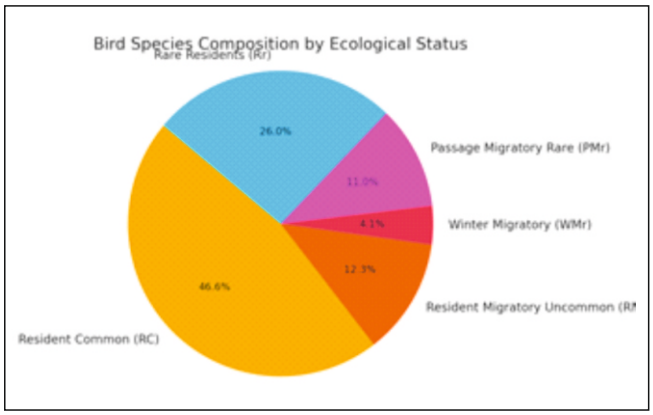
RESULTS

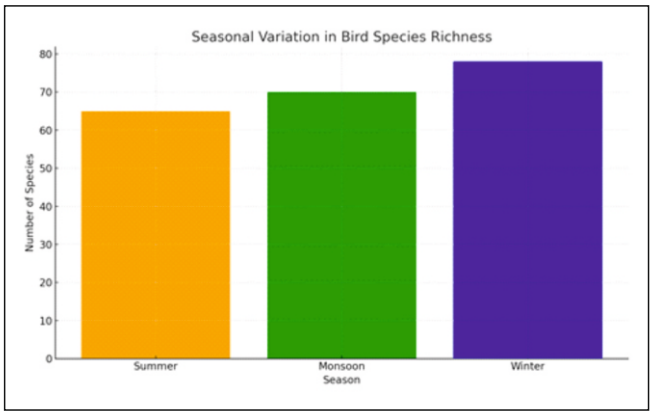
Species Richness and Composition

During the 2022–2024 field survey, a total of 83 bird species were recorded from 15 orders and 27 families (Table No 1). The order Passeriformes was the most dominant, with over 40% of all species recorded, and followed by Ciconiiformes, Columbiformes, and Falconiformes. This high species richness reflects the diverse mosaic of habitats available in Sitakhandi Forest.

Table 1: Summary of avian diversity recorded in Sitakhandi Forest (2022–2024).

Parameter	Value
Total Species	83
Total Orders	15
Total Families	27
Resident Common (RC)	34 species
Resident Migratory Uncommon (RMU)	9 species
Winter Migratory (WMr)	3 species
Passage Migratory Rare (PMr)	8 species
Rare Residents (Rr)	19 species





Seasonal Dynamics

Bird observations were categorized by season into Summer (Mar–Jun), Monsoon (Jul–Oct), and Winter (Nov–Feb). Species richness peaked during the winter season, with several migratory waterbirds and passerines arriving from northern breeding grounds.

Diversity Indices

Using the Shannon-Wiener Diversity Index (H'), we calculated bird diversity across the three seasons:

Table 2: Bird Diversity Indices by Season.

Season	Shannon-Wiener Index (H')	Species Richness (S)
Summer	3.71	65
Monsoon	3.85	70
Winter	4.12	78

Factors affecting on attraction of birds in Sitakhandi Forest:

Seasonal Variations: Breeding and Non-breeding Seasons: During the breeding season (typically post-monsoon to early winter), there is an increase in bird activity, species richness, and diversity due to the availability of food resources and nesting sites.

Migration Patterns: Many migratory bird species visit Sitakhandi Forest during specific seasons, especially winter, contributing to seasonal fluctuations in species composition and abundance.

Resource Availability: Monsoon seasons enhance vegetation growth, providing ample food and shelter, leading to higher bird densities. Conversely, dry seasons may see reduced bird activity and diversity due to scarce resources.

Habitat Quality: Vegetation Structure: Dense, mature forests with diverse plant species support a wide range of bird species, including canopyand ground-dwelling birds.

Human Disturbance: Areas with minimal human activity, such as undisturbed patches of forest, tend to harbor higher avian diversity compared to degraded or fragmented habitats.

Availability of Food and Nesting Sites: Rich habitat quality ensures sufficient food sources (seeds, fruits, insects) and nesting sites, which are critical for sustaining diverse bird populations.

During the June 2022–May 2024 field survey, a total of 83 bird species belonging to 15 orders and 27 families were recorded in the Sitakhandi Forest. The order Passeriformes was the most dominant, accounting for over 40% of the species, followed by Ciconiiformes, Columbiformes, and Falconiformes. This high species richness reflects the mosaic of microhabitats available in the forest, ranging from dense woodland to open scrub and seasonal water bodies. Similar habitat-driven diversity patterns have been reported in other parts of peninsular India (Rahmani, 2000; Ali & Ripley, 1987); however, anthropogenic activities, pollution etc disturb the biodiversity of birds (Prakash and

Verma, 2022; Singh et al., 2023; Kirar and Sharma, 2025).

Comparative studies in the region further contextualize these findings. Balkhande et al. (2013) recorded 48 species at Jagtung Sagar in Kandhar, Nanded district, highlighting the importance of small wetlands. Chavan et al. (2015) documented 168 species in the Godavari River Basin, contributing 17 new species to the 151 previously listed by Kulkarni et al. (2005) for the Nanded region. Similarly, More and Jamdade (2012) studied avifauna in the Painganga Wildlife Sanctuary and recorded 112 species, emphasizing the role of protected riverine habitats in supporting bird diversity. In adjacent Marathwada areas, Patil et al. (2016) identified 97 species in Kaas Plateau, demonstrating comparable richness in seasonal forest ecosystems.

These studies collectively highlight the importance of both aquatic and terrestrial habitats in maintaining regional avian diversity. The present study contributes to this growing body of knowledge by documenting species presence and order-wise richness in a relatively less-studied forest tract, thereby underlining Sitakhandi Forest's role in avifaunal conservation within Nanded district.

CONCLUSION

This study underscores the Sitakhandi Forest's importance as a biodiversity hotspot. Seasonal variation significantly affects bird species composition, with winter being the most diverse season due to migratory species. Continuous monitoring and habitat conservation efforts are essential to preserve the rich avifaunal diversity of the region.

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Table 1: Birds sighted at Sitakhandi Forest, Bhokar during June 2022–May 2024 along with their local status.

Sr. No.	Order	Family	Common Name	Scientific Name	Residential Occurance (Ecological Status)
1	Galiformes	Phasianidae	Indian peafowl	*Pavo Cristatus*	RU
2			Grey Francolin	*Francolinus pondicerianus*	RC
3			Common Quail	*Coturnix coturnix*	RC
4	Coraciformes	Alcedinidae	Pied kingfisher	*Ceryle rudis*	RU
5			Small Blue kingfisher	*Alcedo athis*	RU
6			white-breasted kingfisher	*Hylcyaon smyrmensis*	RO
7		Meropidae	Small Bea-eater	*Merops orientals*	RMO
8		Coraciidae	Indian Roller	*Cracias benghelensis*	RC
9		Upupidae	Common Hoopoe	*Upupa epops*	RMU
10		Bucerotidae	Indian Gray Hornbill	*Ocyceros birostris*	Rr
11	Psittaciformes	Psittacidae	Rose-ringed Parakeet	*Psittacula krameri*	RC
12			Plum-headed Parakeet	*Psittacula cyanocephala*	RC
13	Cuculiformes	Cuculidae	Greater Coucal	*Centropus sinensis*	RU
14			Asian koel	*Eudyanamyas scolopacea*	RU
15	Piciformes	Megalaimidae	Coppersmith Barbet	*Megalaima haemacephala*	Rr
16	Passeriformes	Passeridae	House Sparrow	*Passer domesticus*	RO

17			Baya Weaver	*Ploceus philippinus*	Rr
18		Alaudiadae	Rufous-tailed Finch Lark	*Ammomanes phoenisurus*	RU
19			Indian Bush-Lark	*Mirafra erythroptera*	Rr
20			Ashy-crowned sparrow Lark	*Eremopterix grisea*	Rrr
21		Dicruridae	Black Drango	*Dicrurus macrocercus*	RU
22		Hirundinidae	Wire-tailed Swallow	*Hirundo smithil*	RU
23			Common Swallow	*Hirundo rustica*	RC
24			Dusky Crag-martin	*Hirundo concolor*	Rr
25		Sturnidae	Common Myna	*Acridotheres tritis*	RC
26			Brahminy Starling	*Sturnus pogodarum*	RC
27			Asia-pied Starling	*Strnus contra*	RU
28		Corvidae	Rufous Tree pie	*Dendocitta vagabunda*	RC
29			House Crow	*Corvus splendens*	RO
30		Cisticolidae	Common Tailor Bird	*Orthotomus sutorius*	Rr
31			Ashy prinia	*Prinia socilias*	RU
32		Irenidae	Common Iora	*Aegithina tiphia*	Rr
33		Pycnonotidae	Red-vented Bulbul	*Pycnonotus cafer*	RC
34		Oriolidae	Indian Golden Oriol	*Oriolus oriolus oriolus*	Rr
35		Muscicapidae	Indian Robin	*Saaxicoloiedes fulicata*	RC
36			Oriental Magpie Robin	*Copsychus saularis*	RC
37			Pied Bush Chat	*Saxicola caprata*	Rr
38		Motacillidae	Yellow Wagtail	*Motacilla flava*	RC
39			White Wagtail	*Motacilla alba*	RC
40		Nectariniidae	Purple-rumped Sunbird	*Nectarinia Zeylonica*	RU
41			Purple-Sunbird	*Nectarinia Asiatica*	RU
42		Estrildidae	Red-Avadant	*Amandava amandava*	Rr
43			Spotted Munia	*Lanchura punctulata*	Rr
44			Indian silverbill	*Euodice malabarica*	Rr
45		Vangidae	Common Wood Shrike	*Tephrodomis pondicerianus*	Rr
46	Apodiformes	Apodidae	House Swift	*Apus affinis*	RMO
47		Leiothrichidae	Jungle Babbler	*Argya striata*	RC
48		Monarchidae	Asian Paradise-fly catcher	*Terpsiphone paradisi*	RU
49	Columbiformes	Columbidae	Eurasian Collard-Dove	*Streptopelia decaocta*	RO
50			Little Brown Dove	*Streptopelia senegalensis*	RC
51			Spotted Dove	*Streptopelia chinensis*	RO

52			Rock pigeon	*Columba livia*	RC
53			Yellow-footed Green-Pigeon	*Treron phoenicopterus*	Rr
54	Gruiformes	Rallidae	Common coot	*Fulica atra*	RC
55			White breasted waterhen	*Amaurornis phoenicurus*	RC
56			Purple swamphen	*Porphyrio poliocephalus*	RC
57	Falconiformes	Accipitridae	Black kite	*Milvus migrans*	Rr
58			Brahminy kite	*Haltastur indus*	Rr
59			Black-shouldered kite	*Himantopus himantopus*	Rr
60			Shikra	*Accipiter badius*	RU
61	Anseriformes	Anatidae	Rudy Shelduck	*Tadoma ferruginea*	WMr
62			Spot-billed Duck	*Anas poecilorhyncha*	RC
63			Lesser whistling Duck	*Dendrocygna javanica*	RU
64			Garganey	*Spatula querquedula*	WMr
65			Northern Pintail	*Anas acuta*	WMr
66	Pelecaniformes	Phalacrocoracidae	Little Cormorant	*Microcarbo niger*	RMC
67	Coconiformes	Ardeidae	Indian Pond Heron	*Ardeola grayii*	RC
68			Grey Heron	*Ardea cinerea*	RMU
69			Little Egret	*Egretta gaizetta*	RC
70			Cattle Egret	*Bubuicus ibis*	RC
71			Medium Egret	*Ardea intermedia*	Ru
72		Ciconiidae	Painted stork	*Mycteria leucocephala*	WMr
73			White-naked stork	*Ciconia episcopus*	RU
74			Asian Open-bill stork	*Anastomus oscitans*	WMC
75		Threskiomithidae	Glossy ibis	*Plegadis falcinellus*	PMr
76			Oriental White ibis	*Threskiomis maianocephalus*	RMr
77	Podicipediformes	Podicipitidae	Little Grebe	*Tachybaptus ruflcollis*	RMC
78	Charadriforemes	Recurvirostridae	Black-winged Stilt	*Himantopus himantpus*	WMU
79		Charadriidae	Red-wattled Lapwing	*Vanellus indicus*	RC
80			Little Ringed Plover	*Charadrius dubius*	WMr
81			Common Sand piper	*Actitis hypoleucos*	WMr
82			Curlew Sand piper	*Calidris ferruginea*	WMr
83		Laridae	River Tern	*Sterna aurantia*	RMU

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