Ecological Insights into the Avian Biodiversity of Ratnagiri: Habitat Preferences and Conservation Perspectives

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Abstract— Ratnagiri, a district within the Konkan region of the Western Ghats, harbours rich avian biodiversity spanning wetlands, forests, grasslands, and urban landscapes. This study documents 23 bird species classified into eight orders and twelve families, analysing their habitat preferences, ecological roles, and conservation statuses. While most species are categorized as Least Concern, the Great Pied Hornbill (Buceros bicornis) and Malabar Pied Hornbill (Anthracoceros coronatus) face conservation challenges. The results emphasize the need for habitat-specific conservation strategies to preserve the ecological services provided by these birds, including seed dispersal, pollination, and pest control.

Index Terms- Avian Biodiversity, Habitat Preferences, Conservation Strategies, Ratnagiri, Western Ghats.

I. INTRODUCTION

The Western Ghats, recognized as one of the world's eight "hottest hotspots" of biodiversity, is home to an incredible diversity of flora and fauna, including over 400 bird species (Grimmett *et al.*, 2011). According to Ali and Ripley (1987), the Indian subcontinent is home to 176 bird species classified as endemics, emphasizing the region's ecological significance. These species thrive in a variety of habitats, including grasslands, wetlands, bushlands, and forests, which offer suitable environments for their survival. The Konkan region, as part of this biodiversity hotspot, boasts a distinctive mix of forests, wetlands, grasslands, and coastal ecosystems, making it a crucial habitat for numerous avian species.

The Ratnagiri district, situated in the southwestern part of Maharashtra, is bordered by the Arabian Sea and spans a geographical area of 8,326 square kilometers. Geographically, it lies between 16.98°N and 73.30°E, with over 85% of its terrain being hilly. The district's forest cover, approximately 64 square kilometers, is primarily distributed across Ratnagiri, Khed, Lanja, and Dapoli tehsils. Observers have documented over 350 bird species in the Sahyadri ranges, which are part of the Western Ghats (Pandey, 2013). BirdLife International identifies this region as an area of avian endemism, and the district itself is home to an estimated 270 to 300 bird species.

Birds play a crucial role in maintaining ecosystem functionality by contributing to seed dispersal, pollination, pest regulation, and environmental health. Their habitat preferences and adaptability serve as vital indicators of ecosystem quality, making them essential subjects for biodiversity research (BirdLife International, 2023). While common species such as the House Crow (*Corvus splendens*), Jungle Crow (*Corvus macrorhynchos*), Blue Rock Pigeon (*Columba livia*), Spotted Dove (*Spilopelia chinensis*), Black Kite (*Milvus migrans*), Brahminy Kite (*Haliastur indus*), Red-vented Bulbul (*Pycnonotus cafer*), as well as various egrets and herons, are widely observed across the district, their populations appear stable due to their high adaptability to diverse feeding habits and tolerance to human activities. Conversely, less adaptable species face significant challenges arising from habitat restrictions and anthropogenic disturbances.

In recent years, avian populations in Ratnagiri have been increasingly threatened by human activities. Key issues include habitat destruction, poaching, and exposure to toxic chemicals. Agricultural practices involving the extensive use of pesticides and insecticides, particularly in mango and cashew orchards, pose significant risks to birds by contaminating their food sources. Additionally, fishing activities along the coast, accompanied by oil spills from trawlers and launches, contribute to contamination of the food chain, adversely affecting

avian health. Birds that depend on grassland and scrub vegetation was experienced a greater decline than any other habitats. Habitat loss and degradation of winter foraging and breeding ground observed leading causes of this decline. (Mankadan, 2014, West, 2016, Johnson *et al.*, 2019).

Human interference continues to intensify across all habitat types, raising serious concerns about the sustainable maintenance of avian diversity. It is imperative to balance human development with the conservation of natural habitats through measures such as reserving patches of natural ecosystems and implementing effective conservation strategies that support the feeding and breeding activities of birds. Encouraging avian species to adapt to human proximity could further aid in their sustainable management, ultimately benefiting the broader ecological community, including other animal and plant species.

This study aims to document the avian diversity in and around Ratnagiri, focusing on species distribution across various habitats. The research also emphasizes the ecological roles of these birds and highlights the urgent need for conservation measures to safeguard their populations.

Study Area

Ratnagiri, located in the Konkan region of Maharashtra, features diverse landscapes such as mangroves, wetlands, forests, agricultural fields, and urban settlements. These varied ecosystems are shaped by monsoonal patterns and proximity to the Arabian Sea, creating an ideal environment for a wide variety of bird species.

Methodology

The study was conducted from September 2023 to February 2024, with field visits at regular intervals of 8 days during early mornings and evenings. Observations were carried out using 10×35 binoculars, and photographs were captured using a Nikon Coolpix P900 camera with an 83x zoom. Birds were identified using established field guides and taxonomic references (Ali Salim, 2002; Grimmet *et al.*, 2007; and Jamble, 2010). Their habitats, behaviours, and conservation statuses were recorded and analyzed using the IUCN Red List for global conservation classification (BirdLife International, 2023).

Results and Discussion

Observations and Classification

The study recorded 23 bird species belonging to 8 orders and 12 families. Open and arid lands represented very less bird diversity. These species were distributed across various habitats in Ratnagiri, as summarized below in Table No. 1 :

Table No. 1 Bird species based on their scientific classification, habitat preferences, and conservation status:

Common Name	Scientific Name	Family	Order	Preferred Habitat	Conservation Status
White-throated Kingfisher	*Halcyon smyrnensis*	Alcedinidae	Coraciiformes	Wetlands, agricultural fields, urban areas	Least Concern
Shikra	*Accipiter badius*	Accipitridae	Accipitriformes	Wooded areas, scrublands, urban edges	Least Concern
Grey-fronted Green Pigeon	*Treron pompadora*	Columbidae	Columbiformes	Forests, plantations	Least Concern

Indian Grey Hornbill	*Ocyceros birostris*	Bucerotidae	Bucerotiformes	Deciduous forests, semi-urban regions	Least Concern
Rufous Treepie	*Dendrocitta vagabunda*	Corvidae	Passeriformes	Mixed forests, rural landscapes	Least Concern
Vigors's Sunbird	*Aethopyga vigorsii*	Nectariniidae	Passeriformes	Gardens, forest edges	Least Concern
Oriental White-eye	*Zosterops palpebrosus*	Zosteropidae	Passeriformes	Shrublands, gardens, semi-urban areas	Least Concern
Malabar Pied Hornbill	*Anthracoceros coronatus*	Bucerotidae	Bucerotiformes	Evergreen forests	Near Threatened
Great Pied Hornbill	*Buceros bicornis*	Bucerotidae	Bucerotiformes	Dense rainforests	Vulnerable
House Sparrow	*Passer domesticus*	Passeridae	Passeriformes	Urban areas, agricultural fields	Least Concern
Scaly-breasted Munia	*Lonchura punctulata*	Estrildidae	Passeriformes	Grasslands, wetland fringes	Least Concern
House Crow	*Corvus splendens*	Corvidae	Passeriformes	Urban centers, coastal areas	Least Concern
Black-hooded Oriole	*Oriolus xanthornus*	Oriolidae	Passeriformes	Forests, gardens	Least Concern
Little Green Bee-eater	*Merops orientalis*	Meropidae	Coraciiformes	Grasslands, open woodlands	Least Concern
Asian Paradise Flycatcher	*Terpsiphone paradisi*	Monarchidae	Passeriformes	Dense forests, plantations	Least Concern
Indian Pond Heron	*Ardeola grayii*	Ardeidae	Pelecaniformes	Wetlands, paddy fields	Least Concern
Red Avadavat	*Amandava amandava*	Estrildidae	Passeriformes	Grasslands, marshes	Least Concern
Indian Pitta	*Pitta brachyura*	Pittidae	Passeriformes	Forest undergrowth	Least Concern
Red-wattled Lapwing	*Vanellus indicus*	Charadriidae	Charadriiformes	Open fields, wetlands	Least Concern
Asian Koel	*Eudynamys scolopaceus*	Cuculidae	Cuculiformes	Forests, orchards, semi-urban areas	Least Concern
Red-whiskered Bulbul	*Pycnonotus jocosus*	Pycnonotidae	Passeriformes	Shrublands, gardens	Least Concern
Red-vented Bulbul	*Pycnonotus cafer*	Pycnonotidae	Passeriformes	Urban edges, gardens	Least Concern

Habitat Preferences

Wetland Birds:

Birds such as the Indian Pond Heron, White-throated Kingfisher, and Red-wattled Lapwing rely on wetlands for food and nesting. Their presence indicates healthy aquatic systems essential for biodiversity.

Forest Birds:

The Great Pied Hornbill and Malabar Pied Hornbill are forest specialists that contribute to seed dispersal and forest regeneration. Forest degradation poses a significant threat to their populations.

Urban Birds:

Species like the House Sparrow and House Crow thrive in urban and semi-urban areas, adapting to human activity. Green urban spaces can further support these adaptable species.

Grassland Birds:

Granivores such as the Scaly-breasted Munia and insectivores like the Little Green Bee-eater are essential for pest control and seed dispersion in grasslands.

Conservation Implications

Focus on Forests:

The conservation of evergreen forests is critical for protecting hornbills, which are essential for forest ecology.

Wetland Protection:

Ensuring the health of wetlands is necessary for aquatic bird species and the overall ecological balance of Ratnagiri.

Urban Biodiversity:

Incorporating green spaces into urban planning can support bird populations and enhance ecosystem services in human-dominated areas.

CONCLUSION

This study highlights the diverse habitat preferences of bird species in Ratnagiri, emphasizing their ecological roles in seed dispersal, pollination, and pest control. Targeted conservation strategies focusing on forest preservation, wetland restoration, and urban biodiversity are essential to sustain avian diversity. Collaborative efforts between local communities, policymakers, and researchers are crucial to ensure the long-term protection of these invaluable species and their habitats.

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REFERENCES

[1] Ali Salim (2002) The Book of Indian Birds, BNHS, 13th Reprint.

[2] Ali, S. and Ripley, S.D. (1987). The compact handbook of the birds of India and Pakistan together with those of Bangladesh, Nepal, Bhutan and Sri Lanka. 2nd edition. Delhi: Oxford University Press.

[3] BirdLife International. (2023). The IUCN Red List of Threatened Species. https://www.iucnredlist.org

[4] Grimmet Richard, Carol Inskipp and Tim Inskipp (2007) Pocket Guide to Birds of Indian Subcontinent, Oxford University Press, Reprint.

[5] Grimmett, R., Inskipp, C., & Inskipp, T. (2011). Birds of the Indian Subcontinent (2nd ed.). Bloomsbury Publishing.

[6] Jamble M. N. (2010) Survey of the Avifauna of the Sindhudurga District in Maharashtra in relation to the Biology of Some important Bird Species., Ph. D. Thesis, University of Mumbai.

[7] Johnson Amy EM,T Scott Sillett, David Luther, Valentine Hermann, Thomas A Akre, William J McShea (2019).Effects of Grassland management on Overwintering bird Communities. The Journal of Wildlife Management published by Wiley Periodicals. 83(7),Pp.1515-1526.

[8] Manakandan Ranjit (2014). The grassland birds of Rollapadu Wildlife Sanctuary, Andrapradesh, India with special reference to the impact of

grazing-free enclosures. Journal of the Bombay Natural History society,111(2), Pp.81-89.

[9] Pande Satish, Pramod Deshpande and NiranjanS ant (2013) Birds of Maharashtra, Ela Foundation publication, Pune.

[10] West Andrew S., Patrick D Keyser, Christopher M Lituma, David A Beuchler and Roger D. Applegate (2016). Grassland Bird occupancy of native Warm-season grass, The Journal of Wildlife Management published by Wiley Periodicals.80(6),Pp.1081-1090.