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Assessment of Avian Diversity and Species Richness in Gorewada Lake, Nagpur, Maharashtra, India

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Abstract

Gorewada Lake, situated in the north-western part of Nagpur city in the Indian state of Maharashtra, is a significant fresh water ecosystem that lies amidst a forest area as well as the city. The aim of the current study was to identify the bird diversity and richness present in Gorewada Lake. This was accomplished under the current research work that was carried out for a period of fourteen months ranging from October 2024 to November 2025. Birds were recorded in the morning and evening time slots by making use of binoculars and digital cameras. A total of 14 bird species that belong to 11 families and 9 orders were obtained. The current bird assemblage includes resident as well as local migratory birds that are found to be associated with water bodies as well as land. The findings from the current research work emphasize the significance of Gorewada Lake as a suitable place to dwell and highlight the importance associated with conserving the fresh water ecosystem.

Keywords: Avian diversity, Species richness, Wetland birds, Gorewada Lake, Nagpur

Introduction

Birds are known to be key indicators of ecological importance because they can be affected by any changes that may occur. Wetlands, lakes, and reservoirs also support a variety of bird species since they act as habitats for feeding and roosting.

In India, wetland types vary largely and help maintain bird diversity. Gorewada Lake is among the largest freshwater resources in and around Nagpur city, and the lake was initially developed in the year 1912 by the Water Works Department as a major drinking water resource. This lake lies in the vicinity of dense forests and exhibits rich diversity of plants and animals, and it provides a suitable environment for the habitation of birds. However, there are no serious studies regarding the diversity of bird species of Gorewada Lake. Therefore, the main intention of the present investigation is to focus on documenting the diversity of the avian species of Gorewada Lake.

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India is known to be one of the biologically diverse places in the world because of the varying climatic conditions, geographic characteristics, and diverse ecosystems that the country possesses. It is for this reason that the country has been observed to act as an imperative hotspot for biodiversity conservation. The varied biogeographic regions, along with diverse habitats, make a significant contribution to the presence and richness of species in the form of birds within the country.

Birds have been identified as good indicators of the integrity of ecosystems because they have the capacity to quickly detect changes in the ecosystem. Also, they have diversity in the ecological niches they occupy. The presence of birds in the ecosystem indicates the quality of the predator-prey base of the ecological system and human disturbance. Due to their ecological significance and ability to be easily observed, birds have been useful in biodiversity assessment. The variation in the species of birds found in India shows a clear distinction depending on several types of landscapes: forests, waterlogged areas, agricultural areas, and urban areas. Topography, temperature, vegetation, climate, and accessibility of water are some of the essential natural conditions that determine bird patterns. Nevertheless, in recent years, a marked effect by human factors, including urbanization, habitat destruction, deforestation, and modification of natural habitats, has been noticed, which has adversely impacted bird habitats and survival patterns in many species, with some species adjusting to new habitats created by humans while others face reduced habitats that result in a decline in their population. Wetlands and reservoirs are considered habitats that are valuable for avifauna, especially for water birds. The habitats offer an adequate food source for birds that include plankton, aquatic insects, molluscs, as well as fish. Reservoirs are considered habitats that offer unique conditions that result from the combination of characteristics between habitats that entail running water and those that involve stagnant water.

Previous studies on inland water bodies of Maharashtra reveal that freshwater lakes and reservoirs are known to harbor diverse avifaunal communities with marked seasonal variation. For example, it was found that Malkhed Lake harbors 117 species of birds with high Shannon diversity, which attests to the rich ecological niches (Ali et al., 2024).Similarly, Dongargaon Lake in Bhandara recorded 53 species across various families. This further elucidates how human land uses and habitat heterogeneity shape bird assemblages in lake environments (Makade et al., 2025).State-wide reviews further show that orders such as Ciconiiformes and Anseriformes commonly dominate wetland ecosystems in Maharashtra, though its species richness differs based on seasonal and anthropogenic factors. (Vairagade, 2025) The above findings therefore provide a comparative framework to assess the avian diversity and its species richness at Gorewada Lake.

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This increases the complexity of habitats. Notwithstanding the significant value they have in the ecosystem, freshwater environments in and around urban areas are increasingly under threat from pollution, encroachment, and human activities. It has, therefore, become imperative to continuously monitor the bird diversity in such environments in an attempt to understand the changes in the ecosystem. With the goal of contributing to such studies, the current research will determine the bird diversity and species in Gorewada Lake, Nagpur.

Materials and Methods

Study Area and Duration

Gorewada Lake is located at the north-west corner of Nagpur city, Maharashtra, India. The lake is created by the construction of a dam about 2,350 feet long and was developed in 1912 by the Water Works Department as a major source of drinking water to Nagpur city with a population of about 1.01 lakh at that time. The lake is surrounded by dense forest cover and semi-urban localities such as Zingabai Takli, Borgaon and Gittikhadan. The geographical co-ordinates of the study area are **21.195687° N latitude** and **79.041406° E longitude**. Aquatic habitat combined with forest vegetation and open land offer congenial conditions for various avian species. The present study was conducted over a period of fourteen months from **October 2024 to November 2025.**

Survey Methodology and Data Collection

The main bird surveys were conducted on Sundays and holidays but never less than one visit per month to the study area. The observations were made during the early morning and evening to record the maximum possible bird species and their activities. Birds were observed using binoculars and photographed with digital cameras. Species identification was done with the help of photographs and standard reference books like Ali (2001), Animal Life Encyclopedia, and other relevant literature of ornithological importance. Based on the observations, a checklist and catalog of recorded avian species from Gorewada Lake was prepared.

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Fig. 1. Google Map Location Of Gorewada Lake

Fig. 2. Gorewada Lake

Fig. 3. Location map of Gorewada Zoo and Gorewada Lake, Nagpur, Maharashtra. (Source: Wikimedia Commons, Gorewada Zoo map, CC BY-SA)

Standard identification and taxonomic classification of Indian avifauna followed the descriptions provided by Ali (1996, 2002), which still remain one of the most authoritative references for bird identification, distribution, and habitat preferences across the Indian subcontinent.

Results and Discussion

The present study recorded a total of 14 avian species belonging to 11 families and 9 orders from Gorewada Lake during the study period from October 2024 to November 2025. The recorded avifauna was composed of different ecological guilds like aquatic birds, waders, insectivores,

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piscivores, and omnivores, showing the availability of diverse habitats and food resources in and around the lake. The wetland-dependent birds including herons, egrets, cormorants, lapwings, and moorhens were the major components of the avian community. The presence of species like Phalacrocorax carbo, Microcarbo niger, Ardea purpurea, Egretta garzetta, and Ardeola grayii underlines the suitability of the lake for piscivorous and carnivorous birds, indicating good fish availability and relatively stable water conditions. Kingfishers such as Alcedo atthis, Ceryle rudis, and Halcyon smyrnensis further extend the observation on good fish resources in the lake, since the mentioned kingfisher species need clear water bodies with abundant prey to catch to have successful foraging. Insectivorous birds such as Dicrurus macrocercus, Merops orientalis, and Bubulcus ibis were frequently seen in lake margins, open land, and nearby vegetation. Patil & Tijare (2012) showed that different feeding guilds like piscivorous, insectivorous, omnivorous, and herbivorous species of avifauna were found in the Gorewada Lake region. This reflects high trophic complexity in the lake ecology and thus provides variable food resources.A study conducted in Borgaon, Nagpur, depicted significant avifauna diversity and mentioned habitat heterogeneity and climatic factors as key role players that shape the composition of bird species in central Indian landscapes (Patil & Tijare, 2013).

In that they indicate a healthy insect population and are maintained by the surrounding forest patches, grassland and agricultural area. This is reflected in the occurrence of omnivorous species such as Porphyrio porphyrio and Vanellus indicus, which demonstrate adaptability by utilizing both aquatic and semi-terrestrial habitats. All recorded species were primarily resident in nature, indicating that Gorewada Lake provides stable and favourable conditions for feeding, nesting, and roosting throughout the year. there is very little seasonal fluctuation in habitat quality suggested by the residents' dominance. Such patterns of avian composition have been described from other freshwater wetlands and reservoirs in Maharashtra, indicating regional ecological importance of such water bodies. The diverse bird assemblage encountered at Gorewada Lake could be attributed to habitat heterogeneity represented in open water zones, shallow margins, mudflats, forested surroundings, and human-modified landscapes. However, the growing urbanization, recreation, and anthropogenic disturbances in the catchment area may act as a potential threat to the avian diversity in times to come. Hence, regular monitoring and habitat management will be necessary to preserve the ecological integrity of the lake.

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Chinchkhede and Kedar (2012) have recorded significant avifaunal diversity at the Koradi Lake, indicating that the freshwater lakes in Nagpur district are critical habitats both for resident and migratory species of birds. Ambazari Lake thus has come into prominence as a key wintering ground for migratory birds in central India, underlining the ecological importance of urban and peri-urban wetlands in supporting migratory avifauna (Kedar, 2012). The Padmapur area in Chandrapur district supports a handsome assemblage of avifauna, reflecting the influence of different vegetation types and water availability on bird diversity in eastern Maharashtra. (Telkhade & Jambhule, 2017) Impact assessment studies around industrial zones in Gondia district revealed that anthropogenic activities significantly influence avian diversity and abundance in nearby lakes, hence the need for regular monitoring and conservation-oriented management. Puri & Virani, 2017

Overall, the combined results and discussion that follow show that Gorewada Lake acts as an important refuge for various avian species and plays a significant role in sustaining local biodiversity. The findings provide a useful baseline for long-term avifaunal monitoring and conservation in urban freshwater ecosystems.

Table 1: Checklist of Avian Species Recorded from Gorewada Lake

Abbreviation:- Terrestrial (T), Resident (R), Wetland (W), Agricultural (A), Aquatic (A), Open land (OL)

Sr. No.	COMMON NAME	SCIENTIFIC NAME	FAMILY	ORDER	FEEDING HABIT	STATUS
1	Black Drongo	Dicrurus macrocercus	Dicruridae	Passeriformes	Insectivorous	T, R
2	Black-winged Stilt	Himantopus himantopus	Recurvirostridae	Charadriiformes	Carnivorous	W, R
3	Cattle Egret	Bubulcus ibis	Ardeidae	Pelecaniformes	Insectivorous	W/A, R
4	Common Kingfisher	Alcedo atthis	Alcedinidae	Coraciiformes	Piscivorous	A, R
5	Great Cormorant	Phalacrocorax carbo	Phalacrocoracidae	Suliformes	Piscivorous	A, R
6	Green Bee-eater	Merops orientalis	Meropidae	Coraciiformes	Insectivorous	T, R
7	Indian Pond Heron	Ardeola grayii	Ardeidae	Pelecaniformes	Carnivorous	W, R
8	Little Cormorant	Microcarbo niger	Phalacrocoracidae	Suliformes	Piscivorous	A, R
9	Little Egret	Egretta garzetta	Ardeidae	Pelecaniformes	Carnivorous	W, R
10	Pied Kingfisher	Ceryle rudis	Alcedinidae	Coraciiformes	Piscivorous	A, R
11	Purple Heron	Ardea purpurea	Ardeidae	Pelecaniformes	Carnivorous	W, R
12	Purple Moorhen	Porphyrio porphyrio	Rallidae	Gruiformes	Omnivorous	W, R
13	Red-wattled Lapwing	Vanellus indicus	Charadriidae	Charadriiformes	Omnivorous	W/O L, R
14	White-breasted Kingfisher	Halcyon smyrnensis	Alcedinidae	Coraciiformes	Carnivorous	A/T, R

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Figure 4. Feeding guild composition of avian species recorded from Gorewada Lake, Nagpur

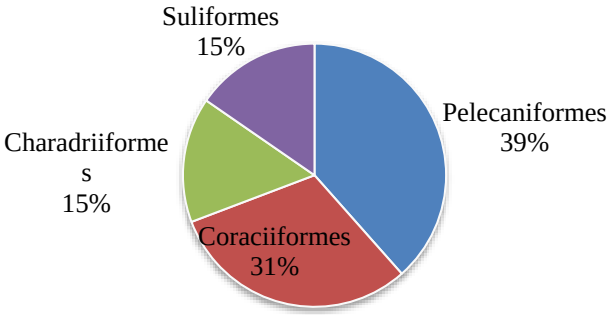
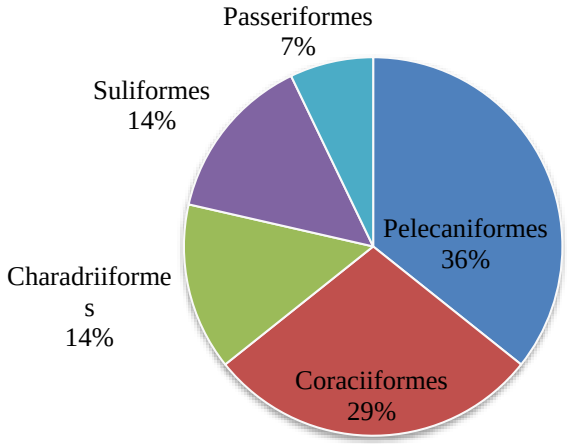


Figure 5. Order-wise Species Distribution



Avifaunal Diversity of Gorewada Lake

Fig. 6. Black drongo

Fig. 7. Black-winged stilt

Fig. 8. Common kingfisher

Fig. 9. Great Cormo

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Fia. 10. Green bee eater

Fia. 11. Indian Pond heron

Fig. 12. Little egret

Fig. 13. Pied Kingfisher

Fig. 14. Purple heron

Fig. 15. Purple moorhen

Fig. 16. Red wattled lapwing

Fia. 17. White breasted kinafisher

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Fig. 18. Cattle egret

Fig. 19. Little cormorent

Conclusion

The present study has concluded that Gorewada Lake supports varied avifauna and acts as an important habitat for resident wetland and terrestrial birds. Its protection from ongoing anthropogenic pressure and habitat degradation requires continuous monitoring and conservation measures. The findings of this study contribute to the baseline data of future avifaunal studies and conservation planning in the region.

References

1. Ali, S. (1996). *The book of Indian birds* (12th rev. ed.). Bombay Natural History Society & Oxford University Press.
2. Ali, S. (2002). *The book of Indian birds* (13th rev. ed.). Bombay Natural History Society & Oxford University Press.
3. Ali, Z. K., Wagh, G., & Chaudhari, P. (2024). Diversity and abundance of wetland avifauna at Malkhed Lake of Amravati region, Maharashtra, India. *International Journal of Fauna and Biological Studies*, 11(4), Part A, 1–6.
4. Chinchkhede, K. H., & Kedar, G. T. (2012). Avifaunal diversity of Koradi Lake in Nagpur District of central India. *Journal of Research in Biology*, 1, 1–6.
5. Deshmukh, G. D. (2024). Patterns of seasonal abundance and diversity in the waterbird community of Padav Talav (pond), near Nagbhid, Maharashtra, India. *International Journal of Life Sciences*, 12(2), 189–197.
6. Kedar, G. T. (2012). Ambazari Lake: A potential stopover point of winter migrants in central India. *Indian Streams Research Journal*, 2(12), 1–4.

7. Makade, S. H., Telkhade, P. M., Bhogam, H. A., & Pottapegula, R. B. (2025). Avifaunal diversity and species richness in Dongargaon Lake, District Bhandara, Maharashtra, India. *Uttar Pradesh Journal of Zoology*, 46(11), 289–297.
8. Patil, K. G., & Tijare, R. V. (2012). Study of feeding habits of avifauna in the vicinity of Gorewada Lake, Nagpur, Maharashtra (India). *Bionano Frontier*, Special Issue, 112–114.
9. Patil, K. G., & Tijare, R. V. (2013). Study of avifauna visited to Borgaon region of Nagpur, Maharashtra, India. In D. R. Khanna, R. Bhutiani, & R. K. Tyagi (Eds.), *Impact of global climate change on earth ecosystems* (pp. 223–240). Biotech Books.
10. Punde, S. B., Ghadi, A., & Kulkarni, M. N. (2025). Avian richness analysis of Wadaj Dam and Ghod River Basin, India. *CWE Journal of Ecological Science*, 20(2), 45–52.
11. Puri, S. D., & Virani, R. S. (2017). Impact assessment of avifauna from selected lakes around Adani Thermal Power Station in Gondia District, Maharashtra, India. *Bioscience Discovery*, 7(2), 140–146.
12. Telkhade, P. M., & Jambhule, S. H. (2017). Avifaunal diversity of Padmapur area, District Chandrapur, Maharashtra, India. *International Journal of Research in Biosciences, Agriculture and Technology*, 5(1), 57–59.
13. Vairagade, S. P. (2025). A review on avian diversity of wetland birds in Maharashtra with reference to various influencing factors. *International Journal of Science and Research*, 14(5), 1023–1029.