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Diversity Patterns of Early Migratory and Resident Birds in the Beddagana Wetland Park, Sri Lanka**Buthsarani, J.A.N.^{1*}, Dissanayake, N.U.S.¹, Dangampola, N.², Jayasinghe, J.K.A.P.³**¹*Department of Forestry and Environmental Science, Faculty of Applied Sciences, University of Sri Jayewardenepura, Nugegoda, Sri Lanka*²*Greensphere Nature Studies, Colombo 06, Sri Lanka*³*Emotional Intelligence and Life Skills Training Team, Sri Jayewardenepura Kotte, Sri Lanka***nirmabuthsarani2001@gmail.com***Abstract**

Wetland ecosystems are essential habitats for resident and migratory bird species, contributing significantly to the preservation of ecological balance and avian biodiversity. This study investigates the avian diversity patterns of early migratory and resident birds at the Beddagana Wetland Park (BWP) in Sri Jayewardenepura Kotte, Colombo, Sri Lanka, a globally significant location within the world's only Ramsar-accredited Capital Wetland City. BWP, characterized by distinct microhabitats including shrubs, woodland, marshy areas, open water bodies bordered by Diyawanna Lake, and canal habitats, serves as a crucial ecosystem for both resident and seasonal bird populations. This study quantifies the species richness, abundance, diversity (Shannon-Wiener index), evenness, and dominance (Simpson index) of early migratory and resident birds from early August to the end of November 2025, representing the initial phase of the migratory season. Bird data were collected using systematic circular plot sampling across 10 fixed plots with a 50 m radius each, strategically distributed across the microhabitats of the park. The point count technique was used, wherein data was collected for a standardized three-minute duration at the center of each plot to mitigate the risk of double-counting and ensure consistent sampling effort. Observations were conducted once a week during two daily windows (6.00 to 9.00 AM and 3.00 to 6.00 PM) on alternating weekdays and weekends, allowing comparisons of temporal and weekly variation and to account for anthropogenic influences on bird distribution and activity. Results revealed that a high avian richness (54 total species), comprising 50 Resident species and 4 Early Migratory species. The resident avifauna showed high diversity (Shannon Index, $H' = 3.19$) and high structural evenness ($J' \approx 0.81$), with low dominance (Simpson $D = 0.08$, $1-D = 0.92$), reflecting a relatively balanced distribution of abundance among species. Dominant contributors to abundance included the Rose-ringed Parakeet and Asian Palm Swift, indicating strong adaptation to heterogeneous urban wetland conditions. The migratory group showed a Simpson Diversity Index ($1-D$) of ≈ 0.78 . Dominance was pronounced among the migratory species, with the Blue-tailed Bee-eater exhibiting the highest overall proportional abundance ($P_i \approx 0.32$) among all 54 recorded species, indicating a significant reliance on the park's resources during this early migration window. Overall, the presence of multiple microhabitats supports high resident diversity while simultaneously providing essential resources for early migrant species. This ecological richness highlights the role of the park as a significant urban biodiversity refuge. This rich, and quantifiable avian diversity represents a significant ecological strength that must be strategically connected to promote Beddagana Wetland Park as a premier, conservation-centric birdwatching destination within the high-density urban environment of the Colombo metropolitan area.

Keywords: *Avian diversity, Urban wetland, Resident birds, Migratory birds, Birdwatching*