



Bird Community Responses to Mangrove Habitat Condition: Evidence from Natural, Degraded, and Restored Ecosystems of Anawilundawa Ramsar Sanctuary, Sri Lanka

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Mangrove ecosystems provide critical habitat for avifauna; however, habitat degradation can alter bird community structure and ecosystem functioning. This study aimed to evaluate bird diversity, density, species composition, and functional group distribution across natural, degraded, and restored mangroves in the Anawilundawa Ramsar Sanctuary. Surveys were conducted monthly for 12 months starting in September 2023 at six fixed point-count stations (two in each habitat type), yielding 72 point-count surveys. Birds were recorded during peak activity periods within a 50m radius for 15 minutes. Recorded species were classified into five functional groups based on their primary habitat preferences: forest birds, grassland birds, wetland-dependent birds, shorebirds, and urban/agricultural generalists. A total of 89 bird species were recorded, including 22 migratory, 66 resident, and one endemic species. Species richness and bird density did not differ significantly among habitat types or across months. Both Shannon and Simpson diversity indices varied significantly among habitats. Shannon diversity was significantly higher in restored than in natural mangroves, whereas Simpson diversity was significantly higher in both degraded and restored mangroves than in natural mangroves. Functional group abundance differed significantly among habitat types, with urban/agricultural generalists representing the dominant functional group across all habitats. Natural mangroves supported a higher proportion of wetland-dependent birds (27.9%), whereas degraded and restored mangroves contained higher proportions of grassland-associated species (19.9% and 22.7%, respectively). Multivariate analyses revealed significant differences in bird community composition among three habitats, and pairwise comparisons confirmed significant differences between all habitat pairs. Findings indicate that although the levels of species richness and bird density in restored and degraded mangroves are comparable to those of natural mangroves, their functional structure and community composition remain distinct. Continued ecological succession and long-term monitoring are therefore essential to determine whether restored mangroves can develop bird assemblages comparable to those of natural mangrove ecosystems.

Keywords: *Diversity, Functional groups, Mangroves, Restoration, Richness*