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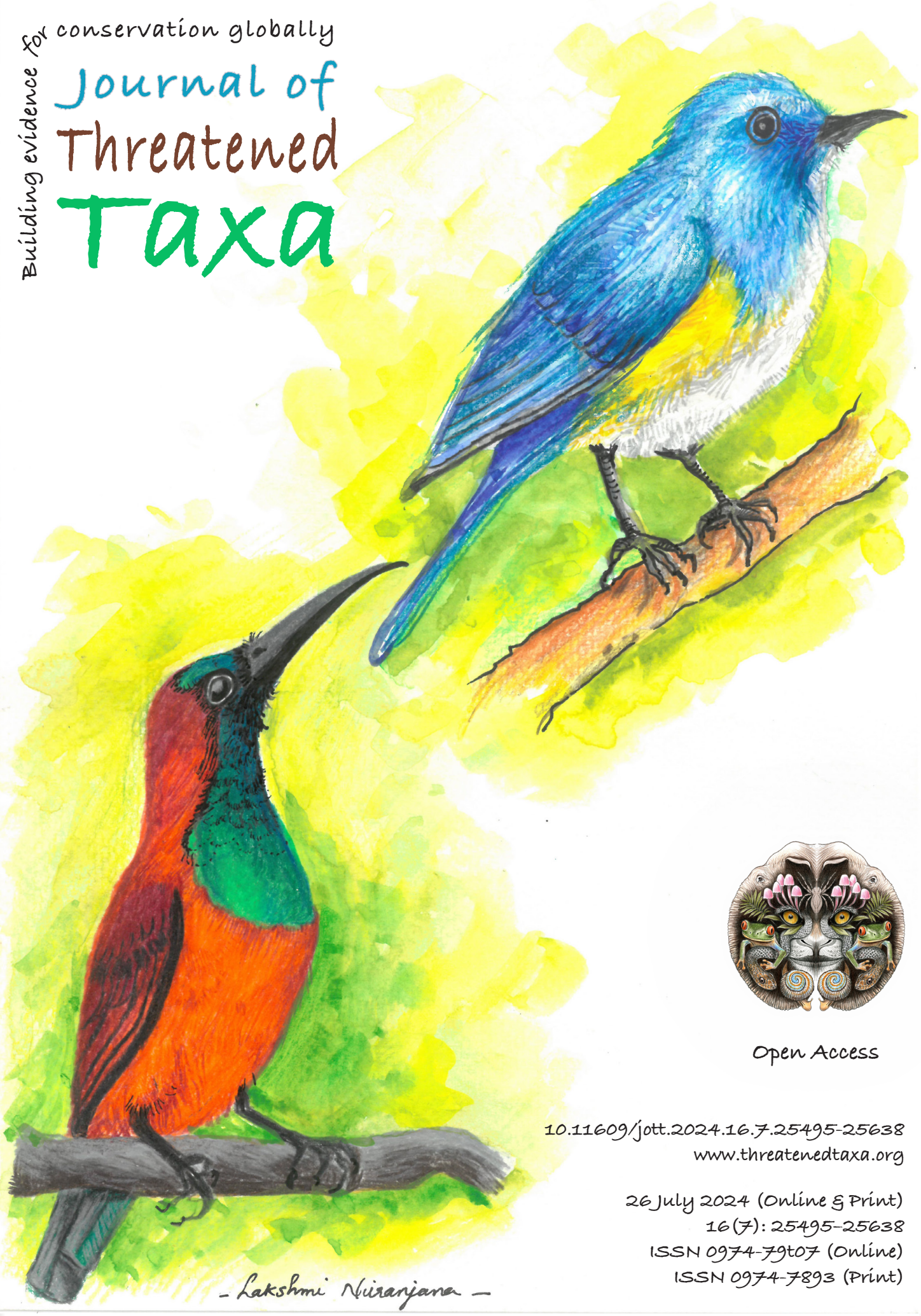

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Cover: Mixed media illustration of a Blue bird and Sunbird. © Lakshmi Niranjana.

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COMMUNICATION

Diversity of bird species in Ebpanan Marsh, Maguindanao del Norte, Bangsamoro Autonomous Region in Muslim Mindanao (BARMM), Philippines

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Abstract: Wetland areas such as the marsh provide vital habitats for birds. However, marshes in the Philippines have been threatened by anthropogenic disturbances and may be further degraded. This study conducted a rapid bird assessment in Ebpanan Marsh located in Maguidanao del Norte within the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM) on 06–12 March 2022. A total of 36 bird species belonging to 24 families were recorded during the rapid assessment. Among the bird species recorded, two species— *Anas luzonica* and *Streptopelia dusumieri* are considered as Vulnerable, while *Padda oryzivora* is considered 'Endangered' in the IUCN Red List of Threatened Species. Eight of the bird species recorded are endemic and are observed in the remaining freshwater swamp forest of the Ebpanan Marsh. Despite habitat degradation and anthropogenic disturbance, the Ebpanan Marsh can still accommodate threatened and endemic bird species. Increasing the number of observation sites and extending the sampling duration of bird assessment will be required in order to complete the list of birds on the Marsh and understand the spatial and temporal variation in bird populations in the area.

Keywords: Anthropogenic disturbance, conservation assessment, endemic birds, freshwater swamp forest, habitat degradation, rapid assessment, species richness, threatened bird species, wetland conservation.

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Author contributions: GRAL—paper conceptualization, data collection, writing and editing the manuscript. BATP—data collection and writing the manuscript. PJDDV—research design, paper conceptualization, data collection, writing and editing the manuscript, and corresponding journal submission.

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INTRODUCTION

A wetland is an area of land that is either covered by water or saturated with water (PAWB-DENR 2013). These areas are varied and include lakes, rivers, marshes, swamps, and reservoirs (Lopez-Calderon & Riosmena-Rodriguez 2016). The Philippines has about 216 lakes, 421 principal rivers, and 22 marshes, swamps, and reservoirs (Scott 1989). Several studies have been conducted highlighting the importance of wetland areas in the country in providing refuges for birds (van Weerd & van der Ploeg 2004; Villamor 2006; Lador & Seronay 2020). These ecosystems provide critical habitats for a wide range of bird species. However, wetland areas in the country, such as marshes, are considered to be one of the threatened ecosystems as the result of changes in land use, pollution, and climate change (Sespeñe et al. 2016). Marsh, a wetland ecosystem mostly dominated by grasses (Keddy 2010), provides a habitat for a rich diversity of flora and fauna, especially birds (Raj et al. 2010; Mohan et al. 2023).

Currently, in the Mindanao Island of the Philippines, there are around 455 species of birds documented of which 49 are globally threatened and 39 are endemic (Avibase 2023). The diversity of bird species has been noted to be a good bio-indicator of ecosystems (Datta 2011; Roshnath & Shruthi 2015), especially in wetland areas (Khadka et al. 2017; Studholme et al. 2022). However, in the Philippines' wetland areas, the diversity of birds is declining due mostly to anthropogenic pressures particularly the conversion of wetland areas for agricultural purposes (Haribon Foundation 2014).

Ebpanan marsh is a wetland area that stretches along different municipalities in Maguindanao del Norte and Maguindano del Sur provinces, and is part of the largest marsh in the country by area, the Ligawasan marsh. The Ligawasan marsh has been considered an Important Bird Area (IBA) and key biodiversity site and this warrants the need to for regular monitoring and updates of the bird composition in the area (Donald et al. 2018). This study provides a list of bird species recorded during the rapid bird assessment conducted in one of the conglomerates of the Ligawasan Marsh, the Ebpanan Marsh located within the Kabuntalan municipality, Maguindanao del Norte. Data from this study may contribute to the knowledge of the current list of birds in Ebpanan Marsh and is possibly the first published report of birds in the area. Government agencies, private stakeholders, and local communities may benefit from this study as this may serve as the basis for crafting conservation and protection policies for Ebpanan Marsh.

METHODS

Study area

The localized rapid bird assessment was conducted in the Ebpanan marsh (7.1451, 124.3391) that is located in Barangay Lower Taviran, Kabuntalan, Maguindanao del Norte, BARMM. The surveyed area for rapid bird assessment was approximately 64.23 hectares and is at least 5 km away from the national road. The marsh is one of three marshes, including the Ebpanan Marsh, Libungan Marsh, and Ligawasan Marsh proper, that collectively form the Ligawasan Marsh, one of the largest wetland areas in the Philippines. The southern to the western portion of the marsh is surrounded by concrete roads and residential areas, making the area easily accessible. The northern portion of the marsh is bordered by the Libungan Marsh while the lower eastern portion is bordered by the Ligawasan Marsh proper. Perennial agroforestry plants such as coconut *Cocos nucifera,* mango *Mangifera indica* and cashew *Anacardium occidentale* are common within the residential areas of the marsh. The study area also included marsh habitats, such as freshwater swamp forests and herbaceous swamp habitats. The presence of *Terminalia catappa* 'Talisay', *Terminalia copelandii* 'Lanipau', *Antidesma ghaesembilla* 'Binayuyo', and *Pterocarpus indicus* 'Narra' was common in the freshwater swamp forest while Water Hyacinth *Eichhornia crassipes,* Water Lettuce *Pistia stratioides*, and Duckweed *Lemna pauciflora* were present in the herbaceous swamp habitat. Most of the residents along the Ebpanan marsh depend heavily on its aquatic resources for food and as a source of income, evidenced by the presence of fish pens and nets. Furthermore, when the dry season arrives and floodwater recedes, certain swamp areas are utilized for cultivating watermelon *Citrullus lanatus* providing the residents with an alternative source of income.

Bird Sampling Technique

Localized rapid bird assessment was conducted between 06–12 March 2022 through the 'look and see', point count, and oppurtunistic listing methods in the Ebpanan marsh located in Barangay Lower Taviran, Kabuntalan municipality, Maguindanao del Norte. Field reconnaissance was conducted to explore the area and to establish the observation sites. Observation sites were established based on accessibility and safety. 10 strategic observation sites were established in the study area (5 in freshwater swamp forest, and 5 in herbaceous swamp habitat). Observation of birds was done from 0600–0900 h and 1500–1730 h by three field observers. Bird

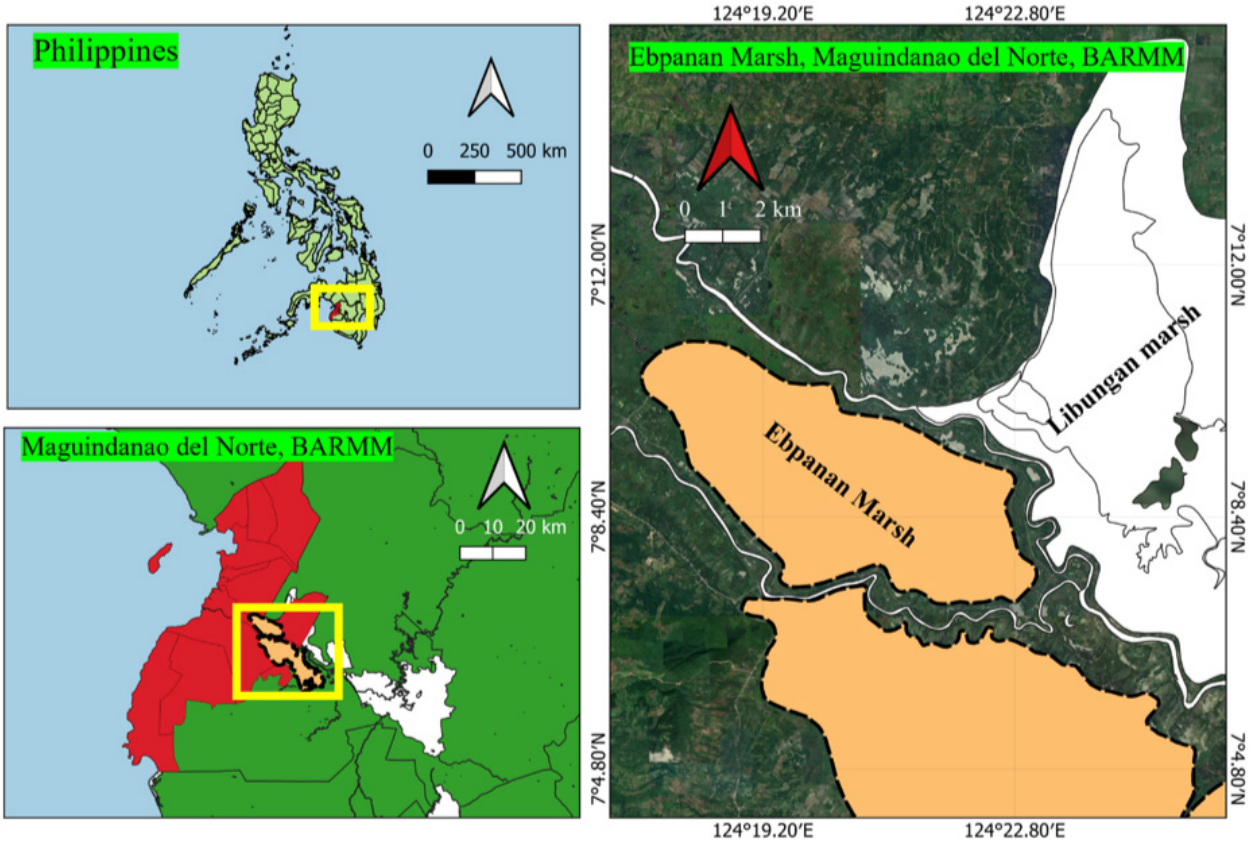

Figure 1. Map of Ebpanan Marsh, Maguindanao del Norte, Bangsamoro Autonomous Region in Muslim Mindanao (BARMM), Philippines (QGISv.3). The map on the upper left shows the map of the Philippines. The map on the lower left is the subset of the yellow polygon in the Philippines map, which is the Ebpanan Marsh located in the province of Maguindanao del Norte in Bangsamoro Autonomous Region in Muslim Mindanao (BARMM). The map on the right is the is the subset of the yellow polygon from the map of Maguindanao del Norte, BARMM. The part of Ebpanan Marsh located in the Barangay Lower Taviran, Kabuntalan municipality (7.1451, 124.3391) was the study area.

documentation was carried out using field notebooks, binoculars, and a DSLR camera. Identification of birds and their respective spatial distribution and habitat range used different available reference materials such as 'Birds of the Philippines' (Allen 2020), eBird (2023), and Birdlife International (2023). The weather was generally sunny during the rapid bird assessment.

RESULTS AND DISCUSSION

Thirty-six species of birds belonging to 24 families were documented during the rapid bird assessment conducted in the Ebpanan Marsh (Table 1). Among the documented species, Ardeidae was the most represented family with seven species. The results of this study show a similar trend in terms of bird species richness in Agusan Marsh (Ardeidae = 13 species) in which species belonging to this family are also abundant. Bird species from this family prefer still open water habitats (Choi et al. 2007) which is common in the marsh. Anecdotal reports mentioned that in some cases the residents of the Ebpanan Marsh hunt egrets for food. Although most of the species of the family Ardeidae are listed as of Least Concern, continuous hunting may threaten their population (Benitez-Lopez et al. 2017). On the other hand, 22% of the bird species documented in Ebpanan Marsh are classified as endemic. This number is low compared to Agusan Marsh (ASEAN Centre for Biodiversity 2023) thus increasing the number of bird surveys may significantly improve the list of birds in the marsh.

Among the 36 bird species recorded, two bird species—the Philippine duck *Anas luzonica* and the Philippine Collared Dove *Streptopelia dusumieri*—are considered 'Vulnerable' and *Padda oryzivora* as 'Endangered' as per the IUCN Red List of Threatened Species (Figure 2). The nearest sightings of *A. luzonica* from the Ebpanan Marsh are in Timaco Hill, Cotabato City (de Vera et al. 2023). Locals in the Ebpanan Marsh hunt and trap the *A. luzonica* along with the Common Moorhen *Gallinula chloropus* for food, thus further

Table 1. List of birds recorded at Ebpanan Marsh, Kabuntalan, Maguindanao del Norte, BARMM.

Family	Scientific name	Common name	Endemism*	Conservation status**
Accipitiridae	*Elanus caerulus*	Black-winged Kite	Resident	Least Concern
	Haliastur indus	Brahminy Kite	Resident	Least Concern
Acrocephalidae	*Acrocephalus stentoreus*	Clamorous Reed Warbler	Resident	Least Concern
Alcedinidae	*Alcedo atthis*	Common Kingfisher	Migrant	Least Concern
	Todiramphus chloris	Collared Kingfisher	Resident	Least Concern
Anatidae	*Anas luzonica*	Philippine Duck	Endemic	Vulnerable
Ardeidae	*Ardea alba*	Great White Egret	Resident	Least Concern
	Ardea intermedia	Intermediate Egret	Resident	Least Concern
	Ardea purpurea	Purple Heron	Resident	Least Concern
	Ardeola speciosa	Javan Pond Heron	Resident	Least Concern
	Bulbucus ibis	Cattle Egret	Resident	Least Concern
	Butorides striatus	Green-backed Heron	Resident	Least Concern
	Egretta garzetta	Little Egret	Resident	Least Concern
Artamidae	*Artamus leucorynchus*	White-breasted Woodswallow	Resident	Least Concern
Columbidae	*Geopelia striata*	Zebra Dove	Resident	Least Concern
	Streptopelia dusumieri	Philippine Collared Dove	Endemic	Vulnerable
Cuculidae	*Centropus viridis*	Philippine Coucal	Endemic	Least Concern
	Eudynamis scolopaceus	Asian Koel	Resident	Least Concern
Dicaeidae	*Dicaeum austral*	Red-keeled Flowerpecker	Endemic	Least Concern
Estrildidae	*Lonchura atricapilla*	Chestnut Munia	Resident	Least Concern
	Padda oryzivora	Java Sparrow	Introduced	Endangered
Laniidae	*Lanius cristatus*	Brown Shrike	Migrant	Least Concern
Laridae	*Gelochelidon nilotica*	Gull-billed Tern	Resident	Least Concern
Locustellidae	*Megalurus palustris*	Striated Grassbird	Resident	Least Concern
Nectariniidae	*Cinnyris jugularis*	Olive-backed Sunbird	Resident	Least Concern
Oriolidae	*Oriolus chinensis*	Black-naped Oriole	Resident	Least Concern
Passeriformes	*Passer montanus*	Eurasian Tree Sparrow	Resident	Least Concern
Psittacidae	*Bolbopsittacus lunulatus*	Guaiabero	Endemic	Least Concern
Psittaculidae	*Loriculus philippensis*	Philippine Hanging Parrot/ Colasisi	Endemic	Least Concern
Pycnonotidae	*Hypsipetes phillipinus*	Philippine Bulbul	Endemic	Least Concern
Rallidae	*Gallinula chloropus*	Common Moorhen	Resident	Least Concern
	Amauronis cinerea	White-browed Crake	Resident	Least Concern
Recurvirostridae	*Himantopus himantopus*	Black-winged Stilt	Migrant	Least Concern
Rhipiduridae	*Rhipidura nigritorquis*	Philippine Pied- Fantail	Endemic	Least Concern
Scolopacidae	*Gallinago gallinago*	Common Snipe	Migrant	Least Concern
Sturnidae	*Aplonis panayensis*	Asian Glossy Starling	Resident	Least Concern

*—eBird Cornell Laboratory for Ornithology (2023) | **—IUCN Red List of Threatened Species (2023).

making them vulnerable to population decline (BirdLife International 2023). The Philippine Collared Dove is classified as Vulnerable due to its rapid decrease in population in Luzon, Philippines mainly attributed to competition from the Red-collared Dove *Streptopelia tranquebarica* and Spotted Dove *Streptopelia chinensis* (BirdLife International 2023). Informing the locals of the status of *A. luzonica* and *S. dusumieri*, and establishing key protected areas, are actions that should prevent further population declines (Nori et al. 2020).

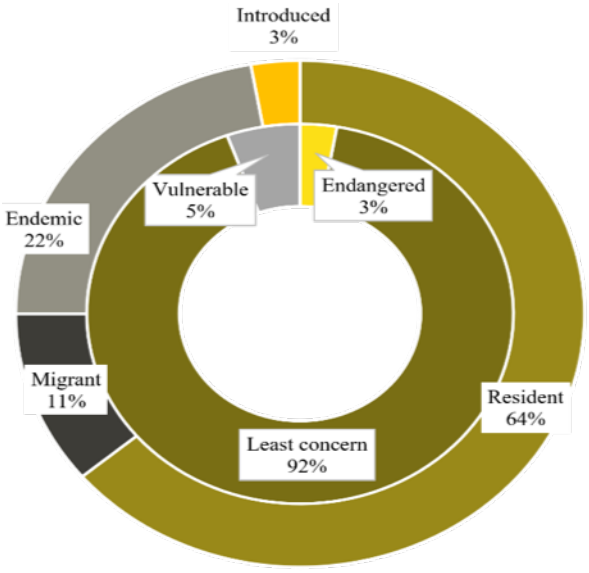

Figure 2. Endemism* and conservation status of birds documented in Ebpanan Marsh, Maguindanao del Norte, BARMM (*eBird 2023; **International Union for Conservation of Nature Red List of Threatened Species 2022).**

The introduced Java Sparrow *Padda oryzivora* was recorded during the rapid bird assessment in Ebpanan Marsh. A flock was recorded near the rice field within the study area. This bird species was considered to be a pest in rice crops. Eight out of the 36 recorded bird species in Ebpanan marsh were classified as endemic. Twenty-three of the 36 species were classified as a resident, four bird species were migrants, and one bird species as introduced (Figure 2). All endemic birds recorded in this study were observed in freshwater swamp forests. Despite the presence of residential areas and the conversion of some areas to agricultural land, the marsh can still harbor endemic bird species. Unfortunately, during the conduct of rapid bird assessment in the area, one *G. chloropus* was trapped and captured, however, this was later freed by local inhabitants. They also mentioned that, based on their observations, there was a decline in the number of bird species and their frequency in the Ebpanan Marsh, and they attributed this to climate change and bird hunting. Aside from bird hunting, another threat that the birds in Ebpanan Marsh are facing is the conversion of freshwater swamp forests into agricultural land. Thus, conservation measures, such as hunting regulations and identifying protected areas within the marsh, are recommended (Dudley 2008).

MANAGEMENT RECOMMENDATIONS

This study recorded a total of 36 bird species from the Ebpanan Marsh. Despite the area being degraded, it still harbors important endangered, vulnerable, and endemic bird species and this underlines the importance of the marsh as an important habitat for birds. Immediate conservation measures should be developed and implemented to prevent further degradation, particularly in the remaining freshwater swamp forest, where all the endemic bird species were recorded. Raising the awareness of the locals regarding the conservation status of the documented birds in the Ebpanan Marsh is deemed necessary to conserve the presence and population of the endangered, vulnerable, and endemic bird species in the area. The data presented in this study provides an indication of the total number of bird species in the Ebpanan Marsh. Therefore, it is recommended that the number of observation sites be increased and the sampling duration extended to permit a complete list of birds to be obtained and more fully understand the spatial and temporal variation of birds in the area.

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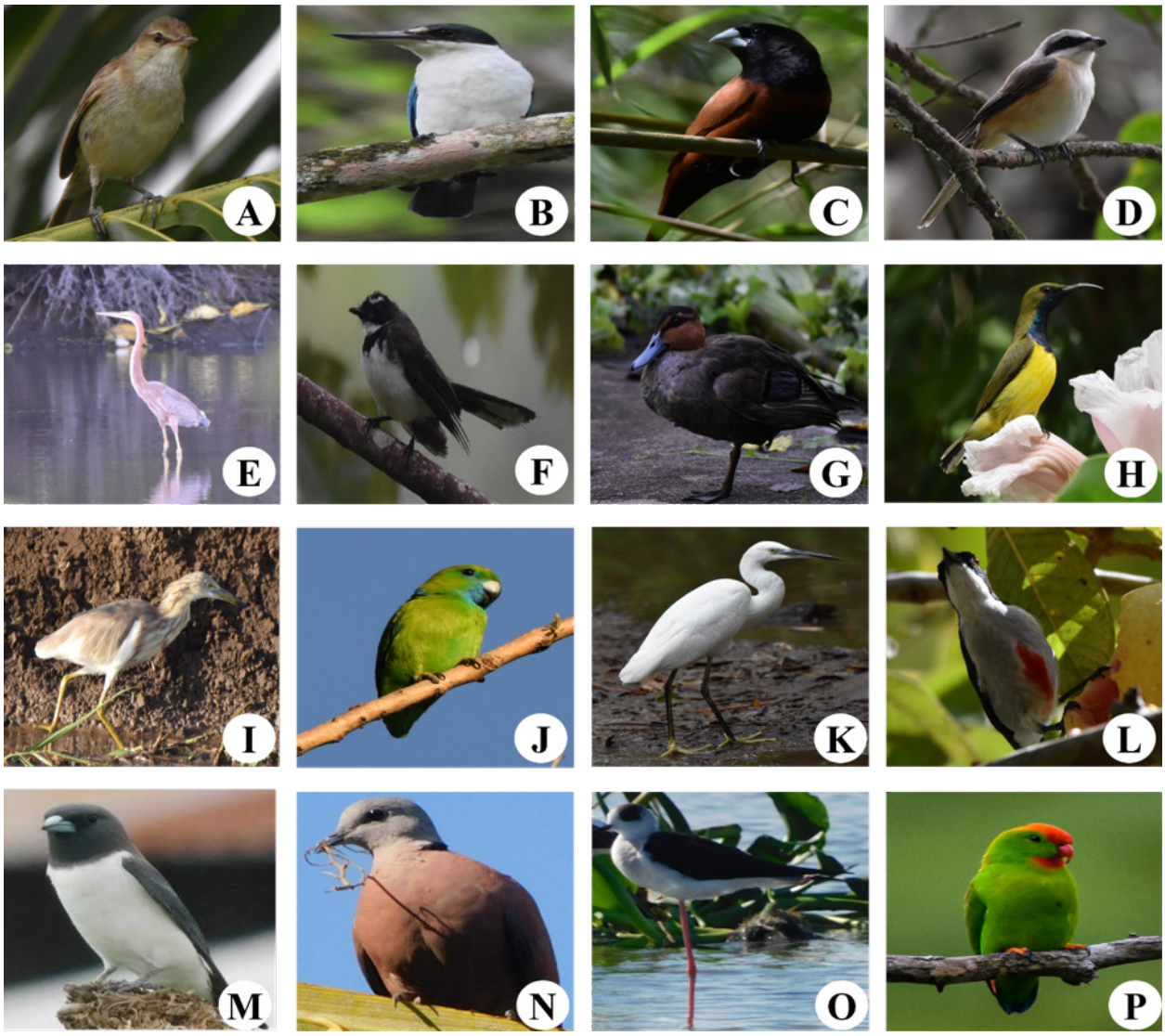

Image 1. Birds found in Ebpanan Marsh, in Ebpanan Marsh, Maguindanao del Norte, BARMM: A—Clamorous Reed Warbler *Acrocephalus stentoreus* | B—Collared Kingfisher *Todiramphus chloris* | C—Chestnut Munia *Lonchura atricapilla* | D—Brown Shrike *Lanius cristatus* | E—Purple Heron *Ardea purpurea* | F—Philippine Pied Fantail *Rhipidura nigritorquis* | G—Philippine Duck *Anas luzonica* | H—Olive-backed Sunbird *Cinnyris jugularis* | I—Javan Pond Heron *Ardeola speciosa* | J—Guaiabero *Bolbopsittacus lunulatus* | K—Little Egret *Egretta garzetta* | L—Red-keeled Flowerpecker *Dicaeum australe* | M—White-breasted Woodswallow *Artamus leucorynchus* | N—Philippine Collared-Dove *Streptopelia dusumieri* | O—Black-winged Stilt *Himantopus himantopus* | P—Philippine Hanging-Parrot/Colasisi *Loriculus philippensis*. © B.A. Pingoy & G.R. Limbaro.

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