

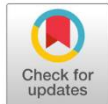
Diversity of bird species in Sandik City Park - West Lombok as ecotourism support

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Abstract

West Lombok is one of the areas on the island of Lombok which has a lot of tourist charm, especially natural tourism. Birdwatching is a bird watching activity that can increase environmental awareness and a source of economic income for tourism managers (ecotourism). The purpose of this study was to determine the diversity of bird species in Sandik City Park located in West Lombok. Bird observation using the Encounter Rates method. From the results of the study, 11 species of birds were found, consisting of honey-sucking, insect-eating, and grain-eating species. The value of bird species diversity was in the medium category ($H'=2.28$), with the highest number of birds dominated by the *Passer montanus*. The Scaly-crowned Honeyeater (*Lichmera lombokia*) is a bird typical of the island of Lombok that can be found easily along with other honey-sucking birds in the morning at Sandik City Park. The primadona plant perch for chirping birds in the garden is the Coral Tree (*Erythrina crista-galli*). By knowing the level of diversity of bird species and the characteristics of their preferred habitat, it is necessary to serve as a guide for the government in managing city parks to be friendlier to animal life, especially birds. Preservation of birds that are maintained in city parks is a feature of habitat sustainability which indirectly brings economic benefits to park managers.

Keywords: Diversity, Birds, City Park, Lombok, Ecotourism

Introduction

West Lombok Regency, which is located in West Nusa Tenggara Province, has a number of natural tourist destinations and city parks that function as a place of recreation for the surrounding community. Various natural tourist destinations such as several TWAs in West Lombok Regency which are managed by the NTB BKSDA have a number of high biodiversity such as birds in TWA Kerandangan, Batulayar District. Sandik City Park is a city park located in Batulayar District, West Lombok Regency, founded in 2015 with the concept of a child-friendly park that has facilities for playing



equipment, to a reading village in the form of a container^{1,2}. In addition, Sandik City Park functions as a place for gymnastics on weekends and jogging every day.

In addition to functioning for social activities and sports, Sandik City Park has a wealth of fauna that inhabit the green area. In the morning, visitors can enjoy the various kinds of chirping birds that inhabit the area. The existence of these birds is due to the fact that Sandik City Park is still beautiful with several shady trees that adorn it. Around the city park, there are still rice fields, plantations, rivers, and hills which are the source of the arrival of birds in the park. Apart from being a stopover location and looking for food, some of the birds in the city park also nest on tree branches. Parks are green infrastructure that are important and beneficial for human and animal life, especially for several types of birds that serve as habitats³. With the presence of various types of birds in Sandik City Park, it has the potential to be used as an ecotourism place.

Ecotourism is “responsible travel to natural areas that conserves the environment, sustains the well-being of local people, and involves interpretation and education”⁴. Birdwatching is an interesting part of ecotourism. Birdwatching ecotourism has had many enthusiasts in the last decade⁵. Birdwatching activities can not only be done in the wild but also in urban areas⁶. Visitors can not only do sports and recreation, but also can learn about the types of birds and their behavior that will foster an attitude of environmental conservation. There are 180 species of birds that have been recorded on the island of Lombok, with 13 of them being endangered⁷. The purpose of this study was to measure the level of bird diversity in Sandik City Park as a supporter of ecotourism.

Materials and methods

Study area

This type of research is quantitative descriptive by direct observation in the field to determine the level of bird species diversity. This research was conducted in April 2022 at Sandik City Park, Jalan Wisata, Sandik, Batulayar District, West Lombok Regency, West Nusa Tenggara 83355. The research location map was created using ArcGis Software 4.1 with data sourced from Google Earth. The pictures and maps of the research locations can be seen in **Figure 1** and **Figure 2** as follows.



Figure 1. Sandik City Park Gate, West Lombok. **Source:** Personal data (2022)



Figure 2. Map of Research Locations (Red Line). Source: Google Earth (2022)

Procedures

Bird observation started from 06.30 – 09.00 WITA using a Nikon Colpix P900 camera equipped with GPS. The bird observation method uses Encounter Rates⁸, namely by exploring and counting and recording every individual encountered. Identification of bird species using the Lombok and Sumbawa Bird Guidebook by⁹ and⁵.

Data analysis

Bird diversity index was calculated using the Shannon-Wiener formula, namely:

$$H' = - \sum p_i \ln (p_i)$$

Information:

- H' : Index of species diversity
- Pi : The proportion of individuals of a species to the total number of individuals Encountered, where $P_i = N_i/N_{total}$
- Ni : Number of individuals of a species
- Ntotal : The total number of individuals of all species
- Ln : Natural logarithm

Table 1. Criteria for diversity index¹⁰

Category	Value
Low	<1
Medium	1–3
High	>3

Results

The results of observing bird diversity in the morning at Sandik City Park can be seen in Table 2, and the results of the documentation (photos) of each bird species obtained are shown in Figure 3.

Table 2. Observations of bird species diversity in Sandik City Park

No.	Bird's name		Subtotal	Perch site	Attendance rate	H'	
	Indonesian	Local					English/Latin
1.	Kapasan Sayap-putih	Etak-etak	White-shouldered Triller / <i>Lalage sueurii</i>	3	<i>Terminalia mantaly</i> , & <i>Wodyetia bifurcata</i>	Medium	0.18
2.	Merbah Cerukcuk	Cerukcuk	Yellow-vented Bulbul / <i>Pycnonotus goiavier</i>	5	<i>Terminalia mantaly</i> , <i>Erythrina</i> sp. & <i>Musa</i> sp.	Medium	0.24
3.	Burungmadu Sriganti	Ceriwit	Olive-backed Sunbird / <i>Cinnyris jugularis</i>	5	<i>Erythrina</i> sp.	High	0.24
4.	Perkutut	Kekolo	Zebra Dove / <i>Geopelia striata</i>	2	<i>Wodyetia bifurcata</i>	Medium	0.13
5.	Cinenen Jawa	Kelincer	Olive-backed Tailorbird / <i>Orthotomus sepium</i>	5	<i>Erythrina</i> sp. & <i>Terminalia mantaly</i> ,	Medium	0.24
6.	Isapmadu Topi-sisik	Kecial nyioh	Scaly-crowned Honeyeater / <i>Lichmera lombokia</i>	5	<i>Erythrina</i> sp.	High	0.24
7.	Cekakak suci	Talsek	Sacred Kingfisher / <i>Todiramphus sanctus</i>	2	Cable	Low	0.13
8.	Layang-layang Loreng	Alat-alat	Striated Swallow / <i>Cecropis striolata</i>	2	Cable	Low	0.13
9.	Pipit Gereja	Jawe	Eurasian tree sparrow / <i>Passer montanus</i>	10	Roof, floor, & <i>Syzygium</i> sp.	High	0.33
10.	Bondol Jawa	Kebawi	Javan munia / <i>Lonchura leucogastroides</i>	5	Bush, & <i>Erythrina</i> sp.	High	0.24
11.	Bondol Haji	Keliang	White-headed Munia / <i>Lonchura maja</i>	3	<i>Erythrina</i> sp. & <i>Terminalia mantaly</i> ,	Medium	0.18
Total (Σ)				47			2.28

Based on the results of bird observations in Table 2, it was found that the bird species obtained were 11 different species with a species diversity value (H') of 2.28 (medium category). Bird species with the highest number of individuals were found in the Eurasian Tree Sparrow (*Passer montanus*) with 10 species. Bird species with the lowest number of individuals were Zebra Dove (*Geopelia striata*), Sacred Kingfisher (*Todiramphus sanctus*), and Striated Swallow (*Cecropis striolata*) with 2 species each. Birds that have high attendance rates are the Olive-backed Sunbird (*Cinnyris jugularis*), Scaly-crowned Honeyeater (*Lichmera lombokia*), Eurasian tree sparrow (*Passer montanus*), and Javan munia (*Lonchura leucogastroides*). Birds of low presence were found in the Sacred Kingfisher (*Todiramphus sanctus*) and Striated Swallow (*Cecropis striolata*) species. The birds' favorite perch is the Coral Tree (*Erythrina* sp.), which is dominated by honeysucking birds and insects.

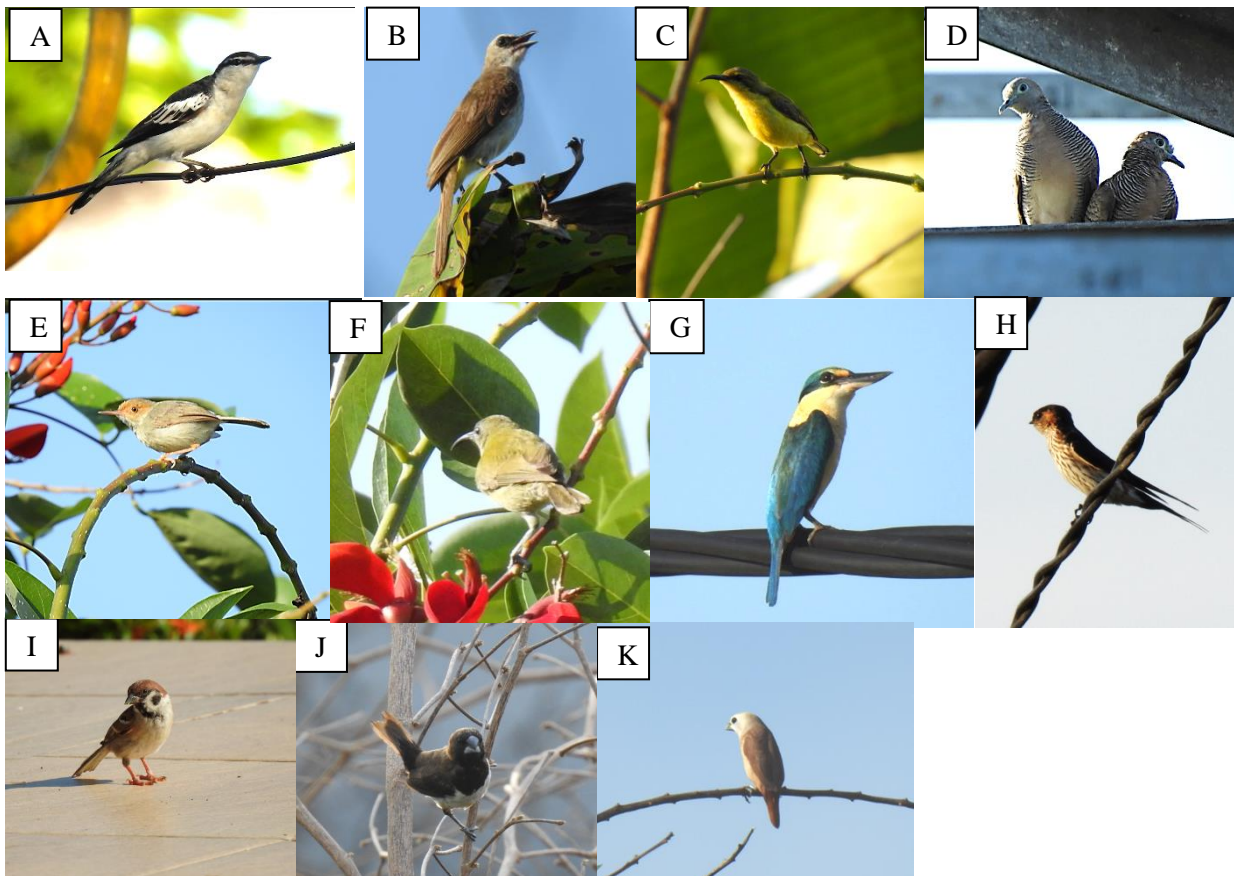


Figure 3. Documentation Results of Birds Species Images in Sandik City Park. Information: A. White-shouldered Triller (*Lalage sueurii*), B. Yellow-vented Bulbul (*Pycnonotus goiavier*), C. Olive-backed Sunbird (*Cinnyris jugularis*), D. Zebra Dove (*Geopelia striata*), E. Olive-backed Tailorbird (*Orthotomus sepium*), F. Scaly-crowned Honeyeater (*Lichmera lombokia*), G. Sacred Kingfisher (*Todiramphus sanctus*), H. Striated Swallow (*Cecropis striolata*), I. Eurasian tree sparrow (*Passer montanus*), J. Javan munia (*Lonchura leucogastroides*), and K. White-headed Munia (*Lonchura maja*). Source: Personal data (2022)

Discussion

There are 3 species of endemic Indonesian birds found in Sandik City Park, namely *Lichmera lombokia*, *Lonchura leucogastroides*, and *Orthotomus sepium*. Scaly-crowned Honeyeater (*Lichmera lombokia*), family of Meliphagidae, is a small (13-15 cm) honey-sucking bird species native to Lombok Island and spread to Sumbawa and Flores islands^{11,12}, and 1 documented on the island of Timor¹² with the status of

Global IUCN Least Concern (LC). The overall body color is dominated by olive green (head and back), while the dark forehead and crown resemble scales⁵. In the morning, this bird with the local name “kecial nyioh”, is often found basking on the top of the tree alone or with a partner. Javan munia (*Lonchura leucogastroides*) is a small (11 cm) terrestrial bird, brown on the back and black on the neck and white belly. This seed-eating bird is endemic to Indonesia, which has a distribution on the islands of Java, Southern Sumatra, Bali, Lombok and Western Sumbawa. This bird likes open land and often comes in groups with other bondol birds in the rice fields, and moves agilely¹³. The Olive-backed Tailorbird (*Orthotomus sepium*) is a small bird measuring 11 cm, with a rust-red head, an endemic species to Indonesia and distributed only on the islands of Java, Bali, Lombok, West Sumbawa with a terrestrial biome habitat¹⁴. The food of these animals are small insects, caterpillars, spiders, their habitat is in open forests and their distribution is up to an altitude of 1500 masl. This bird often perches on short trees and shrubs, and comes in groups with a loud voice, shouting with members of the group.

Birds that are not endemic to Indonesia found in Sandik City Park are 7 species, namely *Lalage sueurii*, *Cinnyris jugularis*, *Lonchura maja*, *Geopelia striata*, *Pycnonotus goiavier*, *Cecropis striolata*, and *Passer montanus*. The White-shouldered Triller (*Lalage sueurii*) is a bird whose distribution is in parts of Indonesia and Timor Leste, namely on the eastern island of Java, Bali, Nusa Tenggara, and southern and central Sulawesi to the island of Timor with Global IUCN Least Concern (LC) status¹⁵. The etak-etak bird in the local language, the characteristics of the male are having a black eyestripe, and the back and crown are blacker than the grayer female. Olive-backed Sunbird (*Cinnyris jugularis*) is a small bird (12 cm) with a habitat originating from mangrove forests, its distribution is quite wide, covering Southeast Asia to a small part of Australia, Queensland¹⁶. The main food is nectar and the male bird with a metallic black chest, often perched on the tip of a tree to sunbathe and emits a loud sound continuously. White-headed Munia (*Lonchura maja*) is a small (11 cm) introduced species on the island of Lombok with a white head when mature. The spread of this bird is in the islands of Java, Sumatra, Malaysia, Southern Thailand, and southern Cambodia¹⁷. Zebra Dove (*Geopelia striata*) is a terrestrial bird with a melodious voice, so many people keep it. The distribution of this bird is not only in Indonesia (Java, Sumatra, Bangka, Belitung, Bali, and Lombok), but also in Malaysia, the Philippines, Brunei Darussalam, and is an introduced species in Sulawesi and Thailand¹⁸. The Yellow-vented Bulbul (*Pycnonotus goiavier*) is a native species in Indonesia and is distributed throughout most of Southeast Asia. This species is recorded as an introduction in southern Sulawesi and Buton Island¹⁹. This bird with the local name Cerukcuk often visits the yard of the house to look for fruits, nectar, and insects to make nests. The Striated Swallow (*Cecropis striolata*) is a species of swallow with a large size (20 cm), characterized by a white chest with black stripes, a black back and head, and a red rump. The distribution area of this bird is Java, Bali, Nusa Tenggara, Timor, Southeast Asia, Bangladesh, to Taiwan²⁰. Eurasian tree sparrow (*Passer montanus*) is the closest bird to humans, often found in yards, and likes to nest on tile roofs. This bird is widespread in Asia and Europe with a Red List status of Least Concern (LC)²¹.

The Sacred Kingfisher (*Todiramphus sanctus*) is a reintroduced bird species in Indonesia originating from Australia and New Zealand with an increasing population trend²². This bird belongs to a common type of kingfisher that is medium in size and likes to perch on power lines with a distinctive and loud sound, namely "Kek-Kek-Kek-Kek"²³. A special feature of this bird is the blue-green color of the back and crown with black eyes. The upper eye-ring is black while the bottom is white, preferably with a black eyestripe. The beak as a whole is black, except at the base of the lower mandible which is white. The breast of this bird is dirty white to orange.

Coral Tree (*Erythrina crista-galli*) which is a member of the Fabaceae, is a plant that is often used as a complement to garden collections, has beautiful red flowers that attract birds to perch, and pollinate it. The flowers of this plant are arranged in clusters resembling a cone, pollinated seeds are thick, downy, and stemmed²⁴. In Sandik City Park, this plant is a prima donna for honey-sucking birds such as

Lichmera lombokia and *Cinnyris jugularis* because of its attractiveness. The birds are comfortable lingering on the plant to look for nectar.

Conclusions

The diversity of bird species in Sandik City Park is classified as moderate ($H' = 2.28$), with the number of documented species as many as 11 species. A favorite plant for birds to perch is Coral Tree (*Erythrina crista-galli*). After knowing the various types of bird species diversity that inhabits Sandik City Park and their behavior, it is necessary to preserve it by designing a city park that is friendly to bird habitat and prohibiting illegal hunting in city parks. Regular visitors especially birdwatchers will be happy to come to the city park if the diversity of birds is still maintained so that it brings economic benefits to traders and city park managers.

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Conflicts of Interest

There are not potential conflicts of interest.

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