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Abstract Template

Identification of Birds In the Green Open Space In Luwuk, Banggai Regency

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Abstract

Indonesia is the fourth largest country in the world after Brazil, Peru, and Columbia, which has a very high level of biodiversity, and one of the most recognaized animals is birds. There are 1,598 bird species in Indonesia. Green Open Space in Luwuk is the habitats for several generalist bird species that can adapt to changes in vegetation. The purpose of this study was to determine the species of birds found in the Green Open Space in Luwuk, Banggai Regency, Central Sulawesi. Methods of data collection in the form of exploration or exploring sydtematically in each research location. Data were collected at three observation stations, namely stasion 1 in Teluk Lalong, station 2 in Taman Sehati, and station 3 in Taman Aktivitas. Observation were made in the morning between 06.00- 10.00 WITA and in the afternoon between 14.00-17.00 WITA. In this study, 12 species were obtained from 11 different families, namely *Passer montanus, Nectarinia jugularis, Dicaeum celebicum, Halcyon macleayii*, *Pycnonotus aurigaster*, *Zosterops palpebrosus*, *Hirundo tahitica*, *Streptopelia chinensis*, *Aplonis panayensis*, *Lonchura molucca*, *Lalage sueurii*, *dan Acridotheres cinereus*. The most dominating bird species at each observation station were *Pycnonotus aurigaster* and *Passer montanus*.

Keywords : *Birds, Green Open Space, Luwuk Banggai*

INTRODUCTION

Indonesia is the fourth country in the world after Colombia, Peru and Brazil that has high biodiversity, where one of the diverse animal groups in question is birds (Saibi *et al.*, 2019). There are 1,598 species of birds found in Indonesia (Safanah et al., 2017). One of the regions in Indonesia that has high bird biodiversity is Sulawesi Island with 380 species. Of these, 96 species are endemic and 60 species with limited distribution. Sulawesi with an area of 187,882 km2 is the largest and most important island in the Wallace Bio-Region (Alotia et al., 2019). Birds are one of the creatures that have uniqueness and high value both ecological, scientific, tourist and cultural values (Ferdiansah, 2017). Birds are wildlife that is easily found in almost every vegetated environment. Its habitat can include various types of ecosystems, ranging from natural ecosystems to artificial ecosystems (Hadinoto, 2012). The high composition and species of birds in an area are supported by the high diversity of habitats for wildlife which generally function as a place to live (Syaputra et al., 2017). Birds are one of the wildlife found in habitats in urban landscapes (Nababan et al., 2021).

Luwuk City is the capital of Banggai Regency, Central Sulawesi Province. With several public Green Open Space (RTH) areas, such as Teluk Lalong RTH, Taman Sehati, and Taman Activity with a diversity of plants, plants, and vegetation (endemic and introduced) in it to support the direct and indirect benefits produced by RTH in urban areas, namely comfort, beauty and welfare, as well as being a habitat for several types of animals, one of which is birds. According to Vikar et al, (2020) urban Green Open Space (RTH) generally does not have a stretch of natural vegetation and is small but can serve as a good alternative habitat for birds.

Bird communities are strongly influenced by urban growth, as changes occur in patterns of wealth and abundance, habitat used, foraging and breeding behavior (Espinel *et al.*, 2019). Bioclimatic areas and the type and degree of urbanization determine the distribution of bird communities in urban Green Open Space (RTH). However, the maximum richness and diversity of such bird communities is not always achieved in less urbanized areas. Bird communities choose habitats with different levels of urbanization according to their habits. For example, in high urban areas there are anthropophilic species that take advantage of human activities, while in low urban areas, bird species that live in agroforestry vegetation are in Green Open Space (RTH) (Magre *et al.*, 2018).

The presence of birds in Green Open Space (RTH) is very influential on the environment. So that birds can reflect a healthy environment because birds have a high enough level of sensitivity to environmental damage, neutralize boredom and create an environment that can be enjoyed (Rilanda, 2017). Birds have potential as ecological indicators because they are one of the biotic components that have a very important role in an ecosystem (Tamar et al., 2020). This is related to the role of birds in the ecological environment as prey, predator, pollinator and seed spreader (Syahrurromadhan, 2021). A study on the identification of bird species in Green Open Space (RTH) in Luwuk city is required due to the lack of data in this area.

RESEARCH METHODOLOGY

The study site is situated in Luwuk City, Banggai Regency's Green Open Space (RTH) area. Taman Activity, Taman Sehati, and Teluk Lalong are the three categories of Green Open Space (RTH) that were selected. In July 2022, the study was carried out, and observations were made twice a day, from 6:00 am to 10:00 am and from 14:00 pm to 17:00 pm WITA. DSLR cameras, lenses, binoculars, the Guidebook for Birds in the Wallacea Region (Coathes and Bishop, 1997), stationery, digital anemometers, GPS, and stationery are the instruments and materials used in this study.

The method of collecting data in bird species observation uses exploration methods carried out by cruising, namely by exploring every corner of the research location (Tambunan, 2016). In this method, observations are carried out by recording the species of birds observed at 3 observation stations, namely station 1 in Teluk Lalong, station 2 in Taman Sehati, and station 3 in Taman Activity. Visually observed bird species identification following the Guide identification book.

RESULTS AND DISCUSSION

In the overall observations at 3 stations, 12 species of birds from 11 different families were found from each Green Open Space (RTH) area in Luwuk city, namely Teluk Lalong RTH, Taman Sehati, and Taman Activity. Bird species found are burung gereja erasia (*Passer montanus*), burung madu sriganti (*Nectarinia jugularis*), burung cabai panggul kelabu (*Dicaeum celebicum*), burung cekakak rimba (*Halcyon macleayii*), burung cucak kutilang (*Pycnonotus aurigaster*), burung kacamata biasa (*Zosterops palpebrosus*), burung layang-layang batu (*Hirundo tahitica*), burung tekukur biasa (*Streptopelia chinensis),* burung perling kumbang *(Aplonis panayensis),* burung bondol taruk (*Lonchura molucca),* burung kapasan sayap putih (*Lalage sueurii)* and burung kerak kerbau *(Acridotheres cinereus*). Research data on the types of birds found in green spaces in the city of Luwuk following in table 1.

Table 1. Research results of the entire observation station area in green spaces

No	Family	Species		Conservation Status
		Local Name	Scientific Name	
1	Passeridae	burung gereja erasia	*Passer montanus*	LC
2	Nectariniidae	burung madu sriganti	*Nectarinia jugularis*	LC
3	Dicaeidae	burung cabai panggul kelabu	*Dicaeum celebicum*	LC
4	Alcedinidae	burung cekakak rimba	*Halcyon macleayii*	LC
5	Pycnonotidae	burung cucak kutilang	*Pycnonotus aurigaster*	LC

6	Zosteropidae	burung kacamata biasa	*Zosterops palpebrosus*	LC
7	Hirundinidae	burung layang-layang batu	*Hirundo tahitica*	LC
8	Columbidae	burung tekukur biasa	*Streptopelia chinensis*	LC
9	Sturnidae	burung perling kumbang	*Aplonis panayensis*	LC
10	Estrildidae	burung bondol taruk	*Lonchura molucca*	LC
11	Campeghagidae	burung kapasan sayap putih	*Lalage sueurii*	LC
12	Sturnidae	burung kerak kerbau	*Acridotheres cinereus*	VU

The existence and presence of birds in a habitat depends on the diversity of vegetation types in an area that supports bird species to carry out various activities. Vegetation types found in green spaces in Luwuk city at each observation station categorized based on flowering are presented in table 2.

Table 2. The vegetation types found in green spaces in Luwuk city at each observation station

No	**Species**	**Category**	**Bird Species Encountered**
1	Pohon Trambesi *(Albizia saman)*	Flowering	Gereja-erasia, Kacamata Biasa, Cucak kutilang, Kapasan sayap putih, cekakak rimba, terkukur biasa.
2	Pohon Ketapang kencana *(Terminalia mantaly)*	Not Flowering	Gereja-erasia, Kacamata Biasa, Cucak kutilang, Kapasan sayap putih, madu sriganti, bondoltaruk, cabai panggul kelabu, Kerak-kerbau
3	Pohon Bintaro *(Cerbera manghas)*	Flowering and Fruitful	Gereja-erasia, Kacamata Biasa, Cucak kutilang, madu sriganti, cabai panggul-kelabu, perling
4	Pohon Tanjung *(Mimusops elengi)*	Fruitful	Gereja-erasia, Kacamata Biasa
5	Pohon Palem raja *(Roystonea regia)*	Not Flowering	Gereja-erasia, Kacamata Biasa, Cucak kutilang,
6	Pohon Jambu air *(Syzygium aqueum)*	Fruitful	Gereja-erasia
7	Pohon Bunga kupukupu *(Bauhinea purpuria)*	Flowering	Gereja-erasia, Kacamata Biasa, madu sriganti
8	Pohon Pinang *(Arecha catechu)*	Fruitful	Gereja-erasia, Kacamata Biasa, Cucak kutilang,
9	Bunga Dadap merah *(Erythrina fariegata)*	Flowering	madu sriganti
10	Bunga Kertas *(Bougainvillea glabra)*	Flowering	Gereja-erasia, bondol taruk

11	Pohon Glodokan *(Polyalthia longifolia)*	Not Flowering and Fruitful	Gereja-erasia, Kacamata Biasa
12	Bunga Kembang sepatu *(Hibiscus rosa-sinensis)*	Flowering	Kacamata biasa
13	Pohon Pinus *(Pinus merkusii)*	Not Flowering	Gereja-erasia, Kacamata Biasa
14	Pohon Ketapang *(Terminalia catappa)*	Not Flowering	Gereja-erasia, Kacamata Biasa, Cucak kutilang, Perling kumbang.
15	Pohon Bakau minyak *(Rhizophora apiculata)*	Not Flowering	Gereja-erasia, Kacamata Biasa, Cucak kutilang,

Description and classification of bird species found in the city green space Luwuk at each observation station can be seen in the following description:

Gereja erasia (*Passer montanus*)

The body is brown, the hood is kadru, black cheek spots, crown, chin and gulp are chestnut-brown, the lower body is grayish yellow, the upper body is mottled with brown with black and white markings. The beak is gray, and the limbs are brown.

Madu sriganti (*Nectarinia jugularis*)

Males upper olive, throat spot and dark metallic mauve blue chest spot. The female upper body is olive, the lower body is yellow, the eyebrows are yellow mostly white outer tail reed. *N. j. platen* (Sulawesi) male with strips on yellow face (varied), and yellow belly. Beak and limbs are black.

Cabai panggul kelabu (*Dicaeum celebicum*)

The upper male is black slightly mauve, throat and chest red, strip-belly black, chin white and belly bands vary widely. The female upper part is grayish olive, the lower part is pale, streaks on the chest are almost absent.

Cekakak rimba (*Halcyon macleayii*)

The head is black, blue with a white bridle spot, the back and limbs are bright blue, the throat and underside are white (the sides may be bunggal). When flying spots are conspicuous white wings and limbs are black.

Cucak kutilang (*Pycnonotus aurigaster*)

Black face and crown. The limb spots are whitish, the tail is dark whitish tip, the tungging is yellow-orange and the limbs are gray.

Kacamata Biasa (*Zosterops palpebrosus*)

The lower body is entirely yellow, the limbs are yellow and the tail is black. Beak and limbs are black. Eye circles are white.

Layang-layang batu (*Hirundo tahitica*)

The upper body is dark, the face and throat are rust-red, the chest is not very pronounced. The bottom is grayish white, without a middle tail feather. Beak and limbs are black.

Tekukur biasa (*Streptopelia chinensis*)

The body is massive, speckled with white, the back neck collar is black. The wing and back covers are pale and dark spotted. The outer tail feathers are blackish, wide-tipped white and the legs are light brown, and the beak is black.

Perling kumbang (*Aplonis panayensis*)

Adult birds are black with a green gloss, red eyes. Juvenile bird, white bottom with black streaks, Grayish beak and limbs black.

Bondol taruk (*Lonchura molucca*)

The face and chest are black, the legs and belly are white with black bars, dark tail, grayish beak, and limbs. Juvenile birds upper body brown, face and crown blacker, limbs and lower part of flowers.

Kapasan sayap putih (*Lalage sueurii*)

Male birds patterned black and white, white eyebrows (sometimes indistinct or absent), white shoulders, gray-white limbs. The upper female bird is brown, the limbs are paler, the edges of the wing feathers are pale, the lower part is whitish, the rest is faintly barred. Beak gray-black, and limbs black.

Kerak kerbau (*Acridotheres cinereus*)

Dark gray body, head, wings and tail blackish. White wing spot, white tail tip, white tugging, short crest. Beak and legs are yellow, iris eyes orange. *A.c. cinerus* (Sulawesi) soot-gray crown, white bellied.

DISCUSSION

1. Results observations of bird species

The dominating bird species were found based on observations made on every day of observation, the types of birds that are always found every day are the *P. montanus*, and *P. aurigaster*. While the least bird found at all three research stations was *A. cinereus* which was recorded only once during observations at station 1 in Lalong. According to Vikar (2020), habitat characteristics and conditions will affect the difference in the number of certain bird species found in their habitat. The area where the most bird species are found is at station 1 in Teluk Lalong RTH.

Flowering tree species such as *E. crista*, *B. purpurea*, and *C. manghas.* Nectar providers as a food source for *N. jugularis* with the average individual species found visiting the tree in pairs per day. The common *Z. palpebrosus* and the *P. aurigaster* were found eating the fruit of the *M. elengi*. Birds such as A. *panayensis, L. sueurii,* and *L. molucca* are found on the vegetation of large trees such as palm trees (*R. regia)*, Ketapang kencana trees (*T. mantaly*), trambesi trees (*A. saman),* Tanjung trees *(M. elengi*), Bintaro *trees (C. manghas*) and water guava trees (*S. aquem*) which are used as a place to fight, make nests, and forage for some species of insectivorous birds. *S. chinensis* birds were found in pairs in the Trambesi tree (*A. saman*) on the second day of observation were seen doing squatting activities.

Vegetation in the open area at station 1 is dominated by shrubs, flowers and shrubs, and several species of palms from the family *Arecaceae* are also equally important habitats for several species of birds such as *P. aurigaster*, and *Z. palpebrosus*. In the pond sub-habitat at station 1 is dominated by aquatic plants Kiambang *(Pistia stratiotes*) and shrubs, as well as Trambesi trees (*S. saman*), which are beside the pond. In the morning there are very many birds such as rock kites (*H.*

tahitica) in pairs doing flying and foraging activities around the pond. The location of station 1 on the edge of the city also reduces interference due to human interaction with several bird species that are very sensitive to human activities which makes this station strategic for various bird species compared to the other two stations.

The lowest bird species is found at station 2 of Sehati park with an area of ± 1,842 m2, the location of this station is located between stations 1 and 3 making it possible for bird species from stations 1 and 3 to fly and explore this station due to the distance of the station without intermediaries. Most bird species found at this station are bird species that are also found at station 1, although there are several bird species such as the *H. tahitica,* S. chinensis, *L*. sueuri*), and A. cinereus* at station 1 is not found at station 2. This is because wildlife, especially birds, need habitat that suits their needs. According to Nababan (2021), specialist birds use resources that are typical in their habitat. In addition, specialist birds are highly susceptible to human activity, making them more likely to seek safer, natural environments.

Taman Sehati is dominated by trees such as Mahogany (*S. mahagoni*), Trambesi *(A. saman*), Glodokan (*P. longifolia*), areca nut (*A. catechu*) and shrubs and shrubs that do not produce fruit and flower so that the availability of the amount of feed for birds at station 2 is very small. According to Ariyanti et al., (2018), the availability of food is the main cause of the abundance of bird species in a particular location. Eating is the most common activity of birds, as evidenced by the number of birds observed perched on trees to eat fruits, insects, or nectar encountered during the study.

The location of Taman Sehati station 2 which is right in the center of Luwuk city also resulted in several species of birds that are very sensitive to human activities not found at the research site. The life of birds can be disturbed if their habitat changes due to human activities or very dangerous construction around them (Nurdiansyah et al., 2019). This is because birds have a high sensitivity to changes in their habitat environment. Compared to station 2, Station 3 Taman Activity has a smaller land area of 0.483 m2. The bird species found are not much different from station 2 because of its location only across from each other and the vegetation at these two stations has almost the same habitat type, which is the vegetation of trees, shrubs, and shrubs. Heterogeneous plant vegetation in a habitat is very supportive of bird species to carry out activities. Station 3 provides better food for birds than station 2 because it is dominated by flowering plants.

Food availability, vegetation and suitable habitat are factors that influence the presence of bird species. In most cases, a particular type of bird behavior is related to its preference for the habitat in question (Laheping et al., 2018). The abundance of *P. montanus* and *P. aurigaster* have been found at research stations because the species readily adapts to a variety of habitats, including shrubs, forest edges, secondary vegetation, roadsides, and even urban parks. In addition to having high adaptability to weather changes, food availability, or predatory conditions, the *P. montanus* is also easier to adapt to human presence (Indra et al., 2020). While the least species of *A. cinereus* found are influenced by the habitat of the species which is not easily found in the RTH area. This shows that the RTH habitat is not a habitat that is often used by the bird.

The high intensity of rainfall in the month of the study was also one of the main factors in the reduction in bird species and individuals encountered. According to Syahputra et al (2017),

moving activities and foraging birds during rainy times will decrease, birds will do more perching and preening activities to increase body temperature. Different observation times also affect the number and species of birds encountered. In general, observations that occur in the morning and evening will produce a greater variation in the type of observations than those that occur during the day. In the morning birds carry out various activities, including foraging, sheltering, perching, and playing (Widyasari et al., 2013). In the morning the habitat at the RTH at each observation station supports the existence of bird species, this is due to the environment that is still quiet from disruption to human activities. During the day bird activity decreases because during the day the bird rests from various activities that have been done in the morning. During the day, the movement of bird activity decreases slightly due to high ambient temperatures (Syahputra et al., 2017). In the afternoon, birds return to activities such as foraging and playing.

2. Conservation status of birds found in Luwuk City RTH

According to IUCN (*International Union for Conservation of Nature*) data in 2022, there are 11 species of birds classified as "*Least Concern*", namely the erasia sparrow (*P. montanus*), the *D. celebicum*, *Pycnonotus aurigaster*, *Pycnonotus aurigaster*, *Hirundo tahitica*, *Streptopelia chinensis*, *Aplonis panayensis*, *Lonchura molucca*, and *Lalage sueurii*. There is 1 species of bird that has a vulnerable status VU *(*Vulnerable*) Acridotheres cinereus*. Population trends of the *S. chinensis* and L. sueurii *were reported to be increasing in their habitats, while the popupulation trends of the Dicaeum celebicu), and Lonchura molucca* were reported to be stable. Birds such as the *P. montanus* and *P. aurigaster* experienced a decline in population trends in their habitat.

According to PP No. 7 of 1999 which discusses "Preservation of Plant and Animal Species", there are two species of birds that belong to the protected category *N. jugularis* and *H. macleayii*. Green open space (RTH) is an effective urban bird species conservation strategy. This strategy is important because of the main role and function of RTH as a buffer for various living things, especially birds.

CONCLUSION

Bird species found in Green Open Space (RTH) in Luwuk city with 3 observation stations Teluk Lalong, Taman Sehati, Taman Activity in total totaled 12 species representing 11 different families. The bird species found are burung gereja erasia (*Passer montanus*), burung madu sriganti (*Nectarinia jugularis*), burung cabai panggul kelabu (*Dicaeum celebicum*), burung cekakak rimba (*Halcyon macleayii*), burung cucak kutilang (*Pycnonotus aurigaster*), burung kacamata biasa (*Zosterops palpebrosus*), burung layang-layang batu (*Hirundo tahitica*), burung tekukur biasa (*Streptopelia chinensis),* burung perling kumbang *(Aplonis panayensis),* burung bondol taruk (*Lonchura molucca),* burung kapasan sayap putih (*Lalage sueurii)* and burung kerak kerbau *(Acridotheres cinereus*).

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