

Bird Diversity in The Freshwater Swamp of Lake Tangkas Ecosystem, Sekernan District, Muaro Jambi Regency

Nursanti¹, Monica Hazelina Hutasoit¹, Ade Adriadi²(*)

¹Department of Forestry, Agriculture Faculty, The University of Jambi

²Department of Biology, Science dan Technology Faculty, The University of Jambi
Jl. Jambi - Muara Bulian KM. 15, Mendalo Darat, Kec. Jambi Luar Kota, Kabupaten
Muaro Jambi, Jambi

*Corresponding Author: adeadriadi@unja.ac.id

Submit February 04th 2023 and Accepted February 28th 2023


Abstract

After Colombia, Peru, and Brazil, Indonesia is the fourth richest country in the world in terms of the number of bird species. Lake Tangkas Nature Tourism is located in two administrative areas, namely Tanjung Terus Village, Sekernan District, Muaro Jambi Regency, and Desa Kaos, Pelayung District, Batanghari Regency, and has an extended form. The region surrounding Tangkas Lake, which is still in its original state, is an ideal habitat for bird species that nest. This study seeks to identify bird species inhabiting freshwater swamp habitats in the Muaro Jambi Tangkas Lake Natural Tourism destination region. This study was conducted in March 2021 at the Lake Tangkas Nature Tourist Area, Tanjung Terus Village, which has 403.11 hectares, Sekernan District, Muaro Jambi Regency. Collecting data on bird species using the point count method. Thirteen observation stations are employed as study locations as counting points. Observations were conducted during peak bird activity, namely in the morning from 6:00 to 10:00 WIB and in the afternoon from 14:00 to 18:00 WIB. According to the results of the study, 36 species of birds from 18 groups (475 individuals) were discovered in the freshwater swamp habitat of Tangkas Lake; the diversity index value is ($H' = 3.12$). The evenness index is 0.87, which places the distribution of bird species in the studied area in the "high" category.

Keywords: Birds, Freshwater Swamp, Species Diversity,



Jurnal Pembelajaran dan Biologi Nukleus is Licensed Under a CC BY SA Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License (CC BY - NC - SA 4.0).

 <https://doi.org/10.36987/jpbn.v9i1.3915>

INTRODUCTION

Indonesia is a country with a great deal of natural beauty and wealth, both in terms of flora and fauna as well as other forms of wildlife, which attracts the attention and admiration of numerous parties both inside and beyond the country. The abundance of bird species is a significant natural resource of Indonesian fauna (Kamal et al., 2013). After Colombia, Peru, and Brazil, Indonesia is ranked fourth in the world in terms of the number of bird species (Mukhtamar et al., 2019). Coupled with the increase in the number

of bird species in Indonesia, which now comprises 1,539 species and 17% of the world's bird population. There are over 9,600 species of birds in the world, and approximately 1,111 species are threatened with extinction (Kamal et al., 2013).

Birds are animals that are widespread and diverse, so that each species of bird have its own originality and beauty (Nurhasanah, 2018). Birds are one sort of animal that may inhabit several habitat types. Depending on habitat type, namely urban regions, rural areas, rice fields, grasses and bushes, lakes/swamps, riverbanks, open plains, mountain forests, and highlands (above 300 meters above sea level) (Tamnge, 2013). Birds may inhabit a variety of environments, including forests, cities, highlands, lowlands, the coastline, lakes/swamps, and caves. One of the environments birds see most frequently is the lake habitat, which offers birds with food, drink, and shelter (Syahputry, 2018).

Tanjung Terus Village is one of the villages in the Sekernan District of the Muaro Jambi Regency that contains natural resources that may be maximally utilized in the sectors of agriculture/plantation, fisheries, and even ecotourism/tourism. Wisata Danau Tangkas, a freshwater swamp ecological region, is one of the applications established in the field of ecotourism in this village (Lake Tangkas Nature Tourism Medium Term Development Plan 2018). The freshwater swamp ecosystem of the Danau Tangkas Nature Tourism area has unique and distinctive vegetation, including lakes covered with purun plants during the dry season, freshwater swamps dominated by putat trees/pendant flowers (*Barringtonia acutangula*), and Tepus Island, which is a part of the Lake Tangkas area that is occasionally flooded with an area of about 1 ha.

The freshwater swamp ecosystem of Danau Tangkas is still natural, so it is a suitable habitat for the life of various bird species. However, since the Danau Tangkas area has become a nature tourism area, it is likely to have an adverse impact on the habitat of various species of marsh birds or wetlands. This study aims to identify the types of birds found in freshwater swamp ecosystems in the Lake Tangkas Nature Tourism area, Muaro Jambi.

METHOD

This investigation was conducted in March 2021 in a freshwater swamp habitat in the Lake Tangkas Nature Tourism area of Tanjung Terus Village, Sekernan District, Muaro Jambi Regency, with an area of roughly 403.11 hectares. The objects observed in this study were bird species found in the freshwater swamp ecosystem in the Tangkas Lake Nature Tourism area, Sekernan District. This study has the limitation that the observed birds are either quiet or perched on the observation plot. Individual birds observed are those that can be seen inside the observation radius. When the weather was sunny, observations were conducted; if it rained, observations were canceled and resumed the following day.

The point count method is used to collect data on the variety of bird species. With this method, observers will stop at certain sites to count the individuals and bird species observed during a specified period of time (Bibby et al., 2000). Seeing bird items with binoculars or binoculars is the direct observation approach. In this study, the distance between each count point is 200 meters. Thirteen observation stations are employed as

study locations as counting points. During the dry season, two observation points were placed on purun-vegetated lakes, one point was placed on Tepus Island, which was occasionally flooded, and 13 observation points were placed in fresh water swamps dominated by *B. acutangula* called putat trees. Observation plots had a radius of 25 meters, and each count point was observed for 20 minutes.

Observations were made when bird activity was high, namely in the morning at 06.00 - 10.00 of Western Indonesian Time (WIB) and continued in the afternoon at 14.00 - 18.00 of Western Indonesian Time (WIB) (Bibby et al., 2000). Each observation plot point was observed 7 times with repetition. Identification of bird species based on research results was carried out descriptively using bird field guidelines in Sumatra, Kalimantan, Java, and Bali (MacKinnon et al., 1993). The status of each bird observed was recorded based on the criteria of (the IUCN International Union for Conservation of Nature (2004), the status of Minister of Environment Regulation No 106 of 2018, and the trade status of CITES Convention On International Trade In Endangered Species Of Wild Fauna and Flora (Soehartono & Mardiasuti 2001).

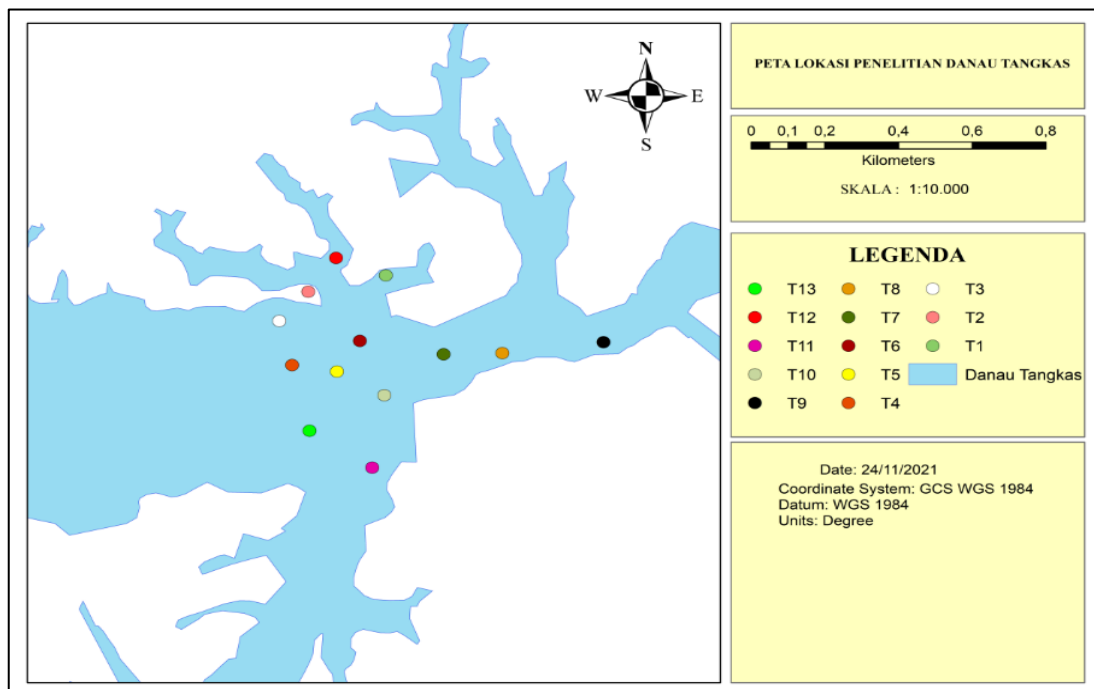


Figure 1. Map of the research location

The value of species diversity is calculated based on the diversity index and evenness index with the following formula. Species diversity is calculated according to the Shannon-Wiener index (H') (Magurran, 1988) with the formula,

$$H' = - \sum \left[\frac{n_i}{N} \mid \ln \mid \frac{n_i}{N} \right]$$

Information :

H' = Shannon diversity index

n_i = The number of individuals of a kind

\ln = Natural logarithm

N = Total number of individuals of all species found

If the value of $H' < 1$ = Low level category of species diversity, $H' 1-3$ = Moderate level category of species diversity, $H' > 3$ = High level category of species diversity. The evenness index of species is calculated using the Evenness Index (Magurran, 1988) with the following formula,

$$E = H' / \ln(S)$$

Information :

E = Evenness index

H' = Diversity of bird species

\ln = Natural logarithm

S = Number of types

If the value of $E \leq 0,4$ = Low Evenness category, $0,4 < E < 0,6$ = Moderate Evenness category, $E \geq 0,6$ = High Evenness category. The Bird Community Similarity Index is used to determine the similarity of bird species found in different habitats. The similarity of bird communities between research locations can be seen by using the species community similarity index (IS) with the Odum formula (Indriyanto, 2006) as follows,

$$IS = \frac{2c}{a+b}$$

Information:

IS = Bird species community similarity index

a = The number of species found in location 1

b = Number of species found in location 2

c = The number of species found in locations 1 and 2

Community Similarity Criteria (Index Similarity) According by Odum, (1993); Pamungkas and Dewi, (2015), If the value from 1- 30% its mean low category, 31- 60% mean Medium category, 61- 91% mean High category, 91%- 100% mean Very high category.

RESULTS AND DISCUSSION

Results

The types of birds found in the freshwater swamp ecosystem of the Tangkas Lake Nature Tourism area are presented in table 1. Based on the research results showed the diversity index value in the Lake Tangkas Nature Tourism area has a value of ($H'=3.12$) indicating that the level of diversity at that location is in the high category. The species diversity index value is also related to the species evenness index value. The species evenness index value is the value used as an indicator of dominance symptoms among each type of community. In the Lake Tangkas Nature Tourism area the evenness index value is ($E=0.87$) which shows the evenness of bird species scattered in the study location in the high category. According to Krebs (1989), that if the evenness index value (E) is close to 1 then no species dominates and the distribution of the number of individuals of each type is even.

Table 1. Birds Diversity in the Swamp Ecosystem of the Tangkas Lake Nature Tourism Area, Muaro Jambi Regency

Family	Latin name	English name	Total	1	2	3	4	5	6	7	8	9	10	11	12	13
Accipitridae	<i>Spilornis cheela</i>	Crested serpent eagle	3								√					
	<i>Ictinaetus malayensis</i>	Black eagle	2										√			
Alcedinidae	<i>Alcedo meninting*</i>	Blue-eared kingfisher*	15	√	√		√						√			√
	<i>Halcyon smyrnensis*</i>	White-throated kingfisher*	11		√				√				√			
	<i>Pelargopsis capensis*</i>	Stork-billed kingfisher*	32								√	√	√	√	√	√
	<i>Todirhamphus chloris*</i>	Collared kingfisher*	13		√									√		
Ardeidae	<i>Todirhamphus sanctus*</i>	Sacred kingfisher*	4		√											
	<i>Ardeola speciosa*</i>	Javan pond heron*	5							√		√				
	<i>Ardea purpurea*</i>	Purple heron*	16				√	√	√						√	
	<i>Bubulcus ibis*</i>	Cattle egret*	18									√	√			
Columbidae	<i>Butorides striata*</i>	Striated heron*	14								√					
	<i>Treron bicincta</i>	Orange-breasted green-pigeon	3								√					
Corvidae	<i>Treron vernans</i>	Pink-necked green pigeon	2										√			
	<i>Corvus enca</i>	Slender-billed crow	4										√			
Cisticolidae	<i>Prinia flaviventris</i>	Yellow-bellied prinia	16													√
Cuculidae	<i>Centropus bengalensis</i>	Lesser coucal	3					√							√	
	<i>Centropus sinensis</i>	Greater coucal	2									√	√			
Dicaeidae	<i>Dicaeum concolor</i>	Nilgiri flowerpecker	10													√
Hirundinidae	<i>Delichon dasypus</i>	Asian house martin	9					√				√	√			
	<i>Hirundo rustica</i>	Barn swallow	52							√		√	√			√
	<i>Hirundo tahitica*</i>	Pacific swallow*	13					√					√			
Muscicapidae	<i>Cyanoptila cyanomelana</i>	blue-and-white flycatcher	3						√							
Nectariniidae	<i>Anthreptes malacensis</i>	Brown-throated sunbird	7													√
	<i>Chalcoparia singalensis</i>	ruby-cheeked sunbird	13									√	√			
Passeridae	<i>Passer montanus</i>	Eurasian tree sparrow	78	√		√							√			
Phasianidae	<i>Cortunix japonica</i>	Japanese quail	2	√												

Picidae	<i>Blythipicus rubiginosus</i>	Maroon woodpecker	3						√
	<i>Dinopium javanense*</i>	Common flameback*	4					√	
	<i>Picooides Moluccensis*</i>	Sunda pygmy woodpecker*	12					√	√
	Pycnonotidae	<i>Pycnonotus aurigaster</i>	Sooty-headed bulbul	28		√			
<i>Pycnonotus goiavier</i>		Yellow-vented bulbul	16						
<i>Pycnonotus brunneus</i>		Asian red-eyed bulbul	21		√				
<i>Pycnonotus plumosus</i>		Olive-winged bulbul	10		√		√		
Sylviidae		<i>Orthotomus ruficeps</i>	Ashy tailorbird	26			√	√	√
Strigidae	<i>Ketupa ketupu*</i>	Buffy fish owl*	2		√				
Turdidae	<i>Brachypteryx montana saturate</i>	White-browed shortwing	3					√	√

Information: code number 1 – 13 = Observation Point; code * = Waterbird

Sources: [Howes, et al \(2003\)](#), [Mackinnon \(1994\)](#), [Ramadhan \(2009\)](#), [Hasudungan \(2007\)](#)

The similarity level of bird species in lake habitat overgrown with purun and freshwater swamp habitat dominated by Putat *B. acutangula* had an IS value of 32.5%. The level of similarity in species between purun-vegetated lakes and Tepus Island has an IS value of 36%, while the level of community similarity in freshwater swamp habitats dominated by Putat *B. acutangula* and Tepus Island is 11%, which means that each observation point is placed in a different habitat. make the similarity of the bird species community in it not the same.

Table 2. Similarity Index of Bird Diversity in the freshwater swamp ecosystem of Tangkas Lake Nature Tourism.

Location	Station 1	Station 2	Station 3
Tepus Island	0,363		
A lake vegetated with Chinese water chestnut (<i>Eleocharis dulcis</i>)		0,325	
Freshwater swamp dominated by <i>Planchonia (Planchonia valida)</i>			0,111

Information: Station 1 = Lake with Chinese Water Chestnut (*Eleocharis dulcis*) vegetation; Station 2 = Freshwater swamp with *Planchonia (Planchonia valida)* tree vegetation; Station 3 = Tepus Island

Granting protected status is one of the efforts to prevent the extinction that occurs in every bird species, so that the existence of these bird species can be maintained in nature. The diversity of bird species is a habitat, because birds have a high level of sensitivity to an environment. Birds have an influence on the condition of an ecosystem that can be said to be good or not good for the living things contained therein. The conservation status of each bird species found in the Lake Tangkas Nature Tourism area is presented in table 3. The conservation status of birds found during observations

according to the IUCN 2015 Red List of Threatened Species, CITES Appendices and Minister of Environment Regulation No. 106 of 2018.

Table 3. Status Conservation of Bird in the swamp ecosystem of the Tangkas Lake Nature Tourism area

Family	Latin name	English name	St. 1	St. 2	St. 3	IUCN	CITES	P NO 106 Tahun 2018
Accipitridae	<i>Spilornis cheela</i>	Crested serpent eagle		√		LC	II	DL
	<i>Ictinaetus malayensis</i>	Black eagle		√		LC	II	DL
Alcedinidae	<i>Alcedo meninting*</i>	Blue-eared kingfisher*	√	√		LC	-	TDL
	<i>Halcyon smyrnensis*</i>	White-throated kingfisher*		√		LC	-	TDL
	<i>Pelargopsis capensis*</i>	Stork-billed Kingfisher *		√		LC	-	TDL
	<i>Todirhamphus chloris*</i>	Collared kingfisher*		√		LC	-	TDL
	<i>Todirhamphus sanctus*</i>	Sacred kingfisher*		√		LC	-	TDL
Ardeidae	<i>Ardeola speciosa*</i>	Javan pond heron*		√		LC	-	TDL
	<i>Ardea purpurea*</i>	Purple Heron*	√			LC	-	TDL
	<i>Bubulcus ibis*</i>	Cattle egret*	√	√		LC	-	TDL
	<i>Butorides striata*</i>	Striated heron*		√		LC	-	TDL
Columbidae	<i>Treron bicinctus</i>	Orange-breasted green pigeon		√		LC	-	TDL
	<i>Treron vernans</i>	Pink-necked green pigeon		√		LC	-	TDL
Corvidae	<i>Corvus enca</i>	Slender-billed crow		√		LC	-	TDL
Cisticolidae	<i>Prinia flaviventris</i>	Yellow-bellied prinia		√		LC	-	TDL
Cuculidae	<i>Centropus bengalensis</i>	Lesser coucal	√	√		LC	-	TDL
	<i>Centropus sinensis</i>	Greater coucal		√		LC	-	TDL
Dicaeidae	<i>Dicaeum concolor</i>	Nilgiri flowerpecker		√		LC	-	TDL
Hirundinidae	<i>Delichon dasypus</i>	Asian house martin	√			LC	-	TDL
	<i>Hirundo rustica</i>	Barn swallow	√	√		LC	-	TDL
	<i>Hirundo tahitica*</i>	Pacific swallow*	√	√		LC	-	TDL
Muscicapidae	<i>Cyanoptila cyanomelana</i>	Blue-and-white flycatcher		√		LC	-	TDL
Nectariniidae	<i>Anthreptes malacensis</i>	Brown-throated sunbird		√		LC	-	TDL
	<i>Chalcoparia singalensis</i>	Ruby-cheeked sunbird		√		LC	-	TDL

Passeridae	<i>Passer montanus</i>	Eurasian tree sparrow	√	√	√	LC	-	TDL
Phasianidae	<i>Coturnix japonica</i>	Japanese quail		√		NT	-	TDL
Picidae	<i>Blythipicus rubiginosus</i>	Maroon woodpecker		√		LC	-	TDL
	<i>Dinopium javanense*</i>	Common flameback *		√		LC	-	TDL
	<i>Picoides moluccensis*</i>	Sunda Pygmy Woodpecker*		√		LC	-	TDL
Pycnonotidae	<i>Pycnonotus aurigaster</i>	Sooty-headed bulbul		√		LC	-	TDL
	<i>Pycnonotus goiavier</i>	Yellow-vented bulbul		√		LC	-	TDL
	<i>Pycnonotus simplex</i>	Cream-vented bulbul		√		LC	-	TDL
	<i>Pycnonotus plumosus</i>	Olive-winged bulbul		√		LC	-	TDL
Sylviidae	<i>Orthotomus ruficeps</i>	Ashy tailorbird	√	√	√	LC	-	TDL
Strigidae	<i>Ketupa ketupu</i>	Buffy fish owl		√		LC	-	TDL
Turdidae	<i>Brachypteryx montana saturate</i>	White-browed shortwing		√		LC	-	TDL

Information:

LC = Least Concern; NT = Near Threatened; DL = Protected; TDL = Unprotected; * = Waterbird
Source: [Howes, et al \(2003\)](#); [Mackinnon, \(1994\)](#); [Ramadhan \(2009\)](#); [Hasudungan \(2007\)](#)

Discussion

The diversity of bird species is an important indicator to determine the condition of the ecosystem sustainability in it. The results of the research conducted showed that the freshwater swamp ecosystem of Lake Tangkas, Sekernan District, Muaro Jambi Regency was classified as rich in bird species. This can be seen from the presence of 475 individual birds from 36 species from 18 families. Two of these species are protected birds according to the Minister of Environment Regulation No. 106 of 2018 (Table 2). The number of bird species in this freshwater swamp area is still higher than the number of bird species in other freshwater swamp areas, such as the Saembawalati swamp forest, Morowali District, where only 34 bird species are found, which also includes bird species that are common in terrestrial habitats [Watalee, et al., \(2013\)](#), Lake Meno which only has 12 species of birds by [Hadiprayitno \(2012\)](#), or Bagan Percut Deli Serdang, which has 33 species of birds from [Jumilawaty et al., \(2011\)](#). However, the number of bird species in the freshwater swamp of Tangkas Lake is still less than that of other freshwater wetlands, such as the irrigation dam in Taoyuan, Taiwan, which is the habitat of 55 species of water birds ([Fang et al., 2009](#)).

The third observation point is located on a higher location that has been flooded on occasion, namely during a huge flood that created an island known as Pulau Tepus. This investigation was conducted in an area where camping, gatherings, and other celebratory events are often held. Tangkas Lake Nature Tourism is influenced by the Batanghari river tides and precipitation, such that when the water conditions are rising (tide), the island would be submerged.

The investigation was conducted in March, which is typically the rainy season in Indonesia, thus the freshwater swamp habitat in the Lake Tangkas Nature Tourism area is undergoing tidal fluctuations (rising). Hence, the discrepancies across bird species reported in this study can be attributed to several variables. The water of Lake Tangkas fluctuates during the dry season and rain season. In relation to this, the sorts of water birds (lake) that are ordinarily seen at that location are absent. It is likely that the birds that could not be located relocated to areas with sufficient food supplies to suit their daily requirements (Hadiprayitno, 2015).

Table 1. Shows that in the freshwater swamp ecosystem of Lake Tangkas there are 13 species of aquatic birds (36.11%) and 23 species of terrestrial birds (63.89%). Quite a number of terrestrial bird species are found in the freshwater swamp ecosystem of Tangkas Lake. However, judging from the number of individual water birds found in freshwater swamp ecosystems, each species has varied and abundant numbers, including 15 individuals of King Prawns-Meninting (*Alcedo meninting*), 32 individuals of Pekaka Emas (*Pelargopsis capensis*), 32 individuals of Cekakak Sungai (*Todirhamphus chloris*) totaled 13 individuals, bush kingfisher (*Halcyon smymensis*) numbered 11 individuals and other different types of water birds. The number of water bird species at this research location is higher than that of research in the Lake Lamo ecosystem, Muaro Jambi Regency (Amalia, 2020), where the number of water birds is not abundant. The diversity of bird species will differ from one place to another, depending on environmental conditions and the factors that influence them (Gagarin, 2019).

One of the most dominant bird species in the freshwater swamp ecosystem of the Danau Tangkas Nature Tourism area is the Eurasian tree sparrow (*Passer montanus*) species, numbering 78 individuals. This is because at the time of observation this bird species was found with the group. According to Leonhart (2009), this bird species often lives in groups, including foraging and perching activities. The Erasia sparrow is a type of bird that has a fairly good adaptability. This species is found in every ecosystem, this is because the Lake Tangkas Nature Tourism area grows shady trees as a place to take shelter and shelter from predators and from unfavorable weather.

Based on the results of research in the Lake Tangkas Nature Tourism area, there are 36 species from 18 families with a total of 475 bird species including the families Accipitridae, Alcedinidae, Ardeidae, Columbidae, Corvidae, Cisticolidae, Cuculidae, Dicaeidae, Hirundinidae, Muscicapidae, Nectariniidae, Passeridae, Phasianidae, Picidae, Pycnonotidae, Sylviidae, Strigidae and Turdidae. Table 2 also shows that the family that has the most species in the freshwater swamp ecosystem of the Lake Tangkas Nature Tourism area is Alcedinidae consisting of 5 species, Ardeidae consisting of 4 species, Pycnonotidae consisting of 4 species, Hirundinidae consisting of 3 species and Picidae consisting of 3 species. Meanwhile, the fewest bird species in the study area are the Black Eagle (*Ictinaetus malayensis*), Ivory Punai (*Treron vernans*), Large Lathe (*Centropus sinensis*), Quail (*Cortunix japonica*), and Beluk Ketupa (*Ketupa ketupu*) each of which amounted to 2 individuals.

The most common types of birds found at each observation point were Stork-billed kingfisher (*Pelargopsis capensis*), Blue-eared kingfisher (*Alcedo meninting*), Barn swallow (*Hirundo rustica*), Purple Heron (*Ardea purpurea*) and Ashy tailorbird (*Orthotomus*

ruficeps). The existence of the *Alcedinidae* family also indicates that the environment is still quite well preserved.

Interviews with local residents who live around the Lake Tangkas Nature Tourism area show that the Ivory Punai species, which was often found some time ago, is now becoming rarer and fewer. This is probably because many of these bird species are hunted for consumption, so their numbers are decreasing. This is in accordance with the results of research that has been carried out, where the ivory Punai bird species (*Treron vernans*) is one of the bird species with the least number of individuals, namely 2 individuals.

Habitats with higher diversity of vegetation types have higher diversity of bird species compared to habitats with poor vegetation types. Birds have a wide range and also the ability to adapt highly, this is a supporting factor for birds that can live in various locations with tolerance to their habitat. One of the species that can live in different habitats found in all study sites is Eurasian tree sparrow (*Passer montanus*), Blue-eared kingfisher (*Alcedo meninting*), Cattle egret (*Bubulcus ibis*), Ashy tailorbird (*Orthotomus ruficeps*), Barn swallow (*Hirundo rustica*), Pacific swallow (*Hirundo tahitica*), and Lesser coucal (*Centropus bengalensis*). Each observed ecosystem has a different diversity value, this is due to the presence of plants in a range of habitats and environmental factors have a major influence on bringing in birds in a location (Rumanasari et al., 2017).

The lowest similarity index value is in the freshwater swamp habitat which is dominated by Putat and Tepus Island, which has an IS value of 0.11. This is presumably because the freshwater swamp habitat which is dominated by Putat has different vegetation conditions from Tepus Island, so it has a different species composition. In the Tepus Island area the vegetation is not too dense, this is thought to affect the breeding of these birds. In contrast to the observation sites, the lake habitat was overgrown with purun and freshwater swamp habitats which were dominated by Putat (*B. acutangula*) which provided protection, food sources and needs for these birds.

According to Rohiyan et al., (2014), a high number of species living in a community implies that the community plays a significant role in the existence of birds in terms of food, nesting, and protection from predators. Habitat is the region where organisms reside in their native state (Paerman, 2002). The low similarity index value is likely attributable to the fact that each observation point's environment has distinct vegetation conditions, resulting in a distinct composition of bird species in the region. This is believed to impact the nesting of these birds in lake settings with grassy vegetation.

Based on the results of observations, the information obtained was that there was one species that was included in the Near Threatened status (near threatened with extinction), namely the quail (*Coturnix japonica*), which totaled 2 individuals. This is because quails are sensitive to human activities. Based on the CITES list, there are two types of birds that are included in the Appendix II category, namely the Black Eagle (*Ictinaetus malayensis*) and the Bido-snake Eagle (*Spilornis cheela*). Furthermore, according to the Minister of Environment Regulation No. 106 of 2018, there are 2 types of protected birds, including the Bido-eagle (*Spilornis cheela*) and the Black Eagle (*Ictinaetus malayensis*). Species of birds are designated as endangered for a variety of reasons, including their tiny population size, the dramatic decline in the number of individuals in the wild, and their restricted range. The finding of bioindicator and protected bird species

indicates that Lake Tangkas is an extremely valuable Nature Tourism area. The potential richness of protected bird species implies that this area is still suitable for the survival of several bird species.

CONCLUSION

Based on the research that has been done, the Lake Tangkas Nature Tourism area is home to 36 bird species from 18 families. There are 12 species that belong to this type of bird. The bird species diversity index value obtained was $H' = 3.12$; this indicates that the diversity of bird species found in that location is in the high category. The Evenness Index value of 0.87 is included in the high category, which means that all bird species in the study area are evenly distributed. The Community Similarity Index value between purun-vegetated lake habitat and freshwater swamp dominated by Putat (*B. acutangula*) trees was $IS = 0.33$; the level of species similarity between purun-vegetated lakes and Tepus Island had an IS value of 0.36; and the freshwater swamp habitat dominated by putat (*B. acutangula*) trees with Tepus Island is 0.11.

ACKNOWLEDGMENTS

This research was funded by Penelitian Dosen Pemula DIKTI 2023, we also thanks to all those who contribute in this research.

REFERENCES

- Alikodra, H. S. (2002). *Pengelolaan Satwaliar Jilid I*. Institut Pertanian Bogor Press. Bogor.
- Amalia, Galuh.R. (2020). Keanekaragaman Jenis Burung Pada Kawasan Ekosistem Desa Danau Lamo. Skripsi. Fakultas Kehutanan Universitas Jambi.
- Bibby C. Martin J. Stuart M. (2000). Teknik-teknik Ekspedisi Lapangan Survei Burung. BirdLife Internasional-Indonesia Programme. Bogor.
- Hadiprayitno, G. (2012). Kajian Pengelolaan Jenis Burung Air dan Habitatnya secara Partisipatif Bersama Masyarakat di Danau Meno Lombok Utara. *Disertasi* (tidak dipublikasikan). Universitas Negeri Malang. Malang.
- Hadiprayitno. (2015). *Ekologi Burung Air Danau Meno*. Arga Puji Press. Mataram Lombok
- Harrison, C dan Greensmith, A, (1993). *Bird of The World*. New York: Dorling Kindersley Inc.
- Hasudungan F. (2007). Perhitungan Burung Air Di Indonesia. Wetlands International-Indonesia Programme. Bogor.

- Howes, J., Bakewell D., Noor Y R. (2003). Panduan Studi Burung Pantai. Wetlands International-Indonesia Programme. Bogor.
- Jumilawaty.E., Mardiasuti.A., Prasetyo.L.B & Mulyani.Y.A. (2011). Keanekaragaman Burung Air Di Bagan Percut, Deli Serdang Sumatera Utara. *Media Konservasi*. 16 (3), 108-113.
- Kamal S., Nursalmi M., & Nisfula S. (2013). Keanekaragaman Jenis Burung pada Perkebunan Kopi di Kecamatan Bener Kelipah Kabupaten Bener Meriah Provinsi Aceh. *Jurnal Biotik*. 1 (2), 67-136.
- MacKinnon J., Phillips K., & van Balen B. (1998). Seri Panduan Lapangan Burung-Burung di Sumatra, Jawa, Bali dan Kalimantan. Bogor: Birdlife International-Indonesia. Program Pusat Penelitian dan Pengembangan Biologi LIPI.
- Magurran, A.E. (2004). Measuring Biological Diversity. Blackwell Publishing. USA.
- Mukhtamar.A., Hari.P., & Muhammad, S.A. (2019). Keanekaragaman Jenis Avifauna Diurnal Pada Lahan Bekas Kebakaran Di Desa Rasau Jaya Umum Kabupaten Kubu Raya. *Jurnal Hutan Lestari*. 7 (3) : 1290 – 1302.
- Nurhasanah, N. (2018). Studi Keberadaan Berbagai Jenis Burung Di Kampus Universitas Lampung. *Skripsi*. Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Lampung. Bandar Lampung.
- Paerman, P. B. (2002). The Scale of Community Structure: Habitat Variation and Avian Guilds in The Tropical Forest. *Journal Ecological Monographs*. 72(13), 19-39.
- Ramadhan, Eko Prasetyo. (2009). Pengenalan Burung Air dan Habitat. Diakses pada 17 Oktober 2022. http://www.burung.org/detail_txt.php?op=article&id=81
- Rumanasari, R.D., Saroyo., & Katili, D.Y. (2017). Biodiversitas Burung pada Beberapa Tipe Habitat di Kampus Universitas Sam Ratulangi. *Jurnal MIPA Unsrat Online*, 4(2), 56-64.
- Setiawan, A., H. S. Alikodra., A. Gunawan dan D. Darneidi. (2006). Keanekaragaman Jenis Pohon Dan Burung D Beberapa Areal Hutan Kota Bandar Lampung. *Jurnal Manajemen Hutan Tropika*, 12(1), 1-13.

How To Cite This Article, with APA style :

Nursanti., Hutasoit, M H., & Adriadi A. (2023). Bird Diversity In The Freshwater Swamp of Lake Tangkas Ecosystem, Sekernan District, Muaro Jambi Regency. *Jurnal Pembelajaran dan Biologi Nukleus*, 9(1), 85-96. <https://doi.org/10.36987/jpbn.v9i1.3915>