BIRDS COMMUNITY IN PROTECTED AREAS IN INDUSTRIAL FOREST PLANTATION OF PT WANA HIJAU PESAGUAN WEST KALIMANTAN

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2024

Article Tittle : BIRDS COMMUNITY IN PROTECTED AREAS IN INDUSTRIAL FOREST PLANTATION OF PT WANA HIJAU PESAGUAN WEST KALIMANTAN

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Date : May, 7, 2024

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FOREWORD

The author would like to express his gratitude to ALLAH, SWT, who has given his grace and guidance, so that this article can be realized. This article discusses bird communities in local protected areas in the PT Wana Hijau Pesaguan industrial forest plantation area in Ketapang, West Kalimantan. It turns out that this area plays an important role in protecting birds.

Local protected areas must maintain their existence and role in protecting birds, especially birds with rare threat and endemic status. As more and more natural forests are converted, it is necessary to provide/remain natural forests that are useful for protecting birds.

The author hopes that this article will be useful for readers

Regards,

Jarwadi Budi Hernowo

List of Content

Summary

The number of bird species in the PT Wana Hijau Pesaguan (WHP) area was identified as 88 species. The richness of bird species is closely related to the type of habitat/vegetation, namely secondary forest conditions (structure, composition of vegetation dominance). Among the bird species that have been discovered, 21 are protected species. The types of birds that have protected status are the Storm Stork (*Ciconia stormi*), Oriental Honey-buzzard (*Pernis ptilorhyncus*), Crested Serpent-eagle (*Spilornis cheela*), Blyth's Hawk-Eagle (*Spizaetus alboniger*) Black-tighed Falconet (*Microhierax fringilarius*), Great Argus (*Argusianus argus*), Blue-eared Kingfisher (*Alcedo meninting*), Rufous-backed Kingfisher (*Ceyx rufidorsus*), Banded Kingfisher (*Lacedo pulchella*), White-crowned Hornbill (*Berenicornis comatus*), Wreathed Hornbill (*Aceros undulatus*), Black Hornbill (*Anthrococeros malayanus*), Buceros Hornbill (*Buceros rhinoceros*), Helmeted Hornbill (*Rhinoplax vigil*), Pied Fantail (*Rhipidura javanica*), Brown Throated Sunbird (*Anthreptes malacensis*), Purple napped Sunbird (*Hypogramma hypogrammicum*), Olive backed Sunbird (*Cinnyris jugularis*), Purple-throated Sunbird (*Leptocoma sperata*) Lesser Spiderhunter (*Arachnothera longirostra*), and Spectacled Spiderhunte (*Arachnothera flavigaster)*. Types of birds that have the CITES Appendix II category include the Oriental Honey-buzzard (*Pernis ptilorhyncus*), Crested Serpent-eagle (*Spilornis cheela*), Blyth's Hawk-Eagle (*Spizaetus alboniger*), Black-tighed Falconet (*Microhierax fringilarius*), Great Argus (*Argusianus argus*), White-crowned Hornbill (*Berenicornis comatus*). Wreathed Hornbill (*Aceros undulatus*), Black Hornbill (*Anthrococeros malayanus*), Buceros Hornbill (*Buceros rhinoceros*), Blue crowned Hanging Parrot (*Loriculus galgulus*). The Helmeted Hornbill (*Rhinoplax vigil*) is listed as Appendix I. One type of bird that is in the Endanger category according to the IUCN is the Storm Stork (*Ciconia stormi*), which is categorized as near threatened (Near Threaten), Crested Fireback (*Lophura ignita*), Great Argus (*Argusianus argus*), White-crowned Hornbil (*Berenicornis comatus*), Black Hornbill (*Anthrococeros malayanus*), Buceros Hornbill (Buceros rhinoceros), Helmeted Hornbill (*Rhinoplax vigil*), Red-crowned Barbet (*Megalaima rafflesii*), Red throated Barbet (*Megalaima mystacophanos*), Black-and-Yellow Broadbill (*Eurylaimus ochromalus*), Grey-bellied Bulbul (*Pycnonotus cyaniventris*), Finsch's Bulbul (*Criniger finschii*), Bornean Bristlehead (*Pityriasis gymnocephala*), Maroon-breasted Philentoma (*Philentoma velatum*) and Chestnut rumped Babbler (*Stachyris maculata*). The types of birds recorded at the WHP location as migratory birds from the Northern Hemisphere are Oriental Honey-buzzard (*Pernis ptilorhynchus*), and Asian Brown Flycatcher (*Muscicapa daurica*).

I. INTRODUCTION

Background

PT Wana Hijau Pesaguan (PT WHP) is a company operating in the forestry sector, specifically industrial forest plantations. PT Wana Hijau Perkasa obtained an area concession in Pesaguan sub-district, Ketapang Regency, West Kalimantan with an area of 104 975 ha. In order to build an industrial plantation forest, PT WHP wants to obtain basic ecological data (Base Line on Ecological) regarding the diversity of bird species in the PT WHP area.

PT Wana Hijau Pesaguan is committed to minimizing the impacts arising from the development of industrial forest plantations in its area. PT Wana Hijau Pesaguan has begun conducting basic studies on biodiversity, in this case the subject of discussion is the diversity of bird species in the PT WHP area.

PT WHP's planning from the start in developing HTI will comply with and fulfill all Indonesian government regulations relating to the environment such as the biodiversity convention relating to the diversity of bird species in the PT WHP area.

Study Objectives

Bird community studies were carried out in the PT WHP area, Pesaguan sub-district, Ketapang Regency, West Kalimantan. The study objectives include:

1. Obtain basic data and information related to the community of bird species in the WHP area
2. Determine the abundance of birds and bird community structure in the WHP area
3. Obtain status data and a list of bird species that need close attention Conservation in the WHP area
4. Obtain data and information for Industrial Plantation Forest development in the WHP area

II. DISCRIPTION GENERAL CONDITIONS OF PT WANA HIJAU PESAGUAN

PT Wana Hijau Pesaguan (WHP) is administratively included in Pesaguan District, Ketapang Regency, West Kalimantan Province. The geographical position of this area is between 110˚10' East Longitude–110˚56' East Longitude and 0˚37' South Latitude–0˚46' South Latitude. The boundaries of the PT area partnership. Wana Hijau Pesaguan is as follows:
North: IUPHHK-HA PT. Suka Jaya Makmur
East: Central Kalimantan Province
South side: IUPHHK-HA PT. Wanakayu Batu Putih
West: PT. Plantation. Green Permata Wana Lestari

There are several rivers in the WHP area, but those that flow at the observation location are tributaries.

The climate in the PT. Wana Hijau Pesaguan Industril Forest Plantation, based on the Schmidt and Ferguson classification system, is included in type A rainfall and can be classified as a tropical climate. The average annual rainfall reaches more than 2500 mm/year and the average rainy days reach 20 days/month.

Land at the location of PT. Wana Hijau Pesaguan develops from igneous/metamorphic rocks and sedimentary rocks. Land at the location of PT. Wana Hijau Pesaguan is classified into three orders, namely Ultisol, Entisol and Inceptisol based on the properties of the soil and how it is formed.

The vegetation type in the WHP area is generally a lowland rainforest type. The condition of the forest is secondary forest that has been logged over (log over area).

III. METHODS

Location and Time

Data and information relating to the diversity of bird species in the WHP area were collected approximately one month June 2014. Observations focused on bird habitat types in the Wildlife Conservation Area (Kawasan Konservasi Pelestarian Satwaliar), Germplasm Conservation Area (Kawasan Konservasi Plasma Nutfah) and the Bufferzone section. The north is Mount Muru Bayan, and the south is Mount Tukul.(figure 1)

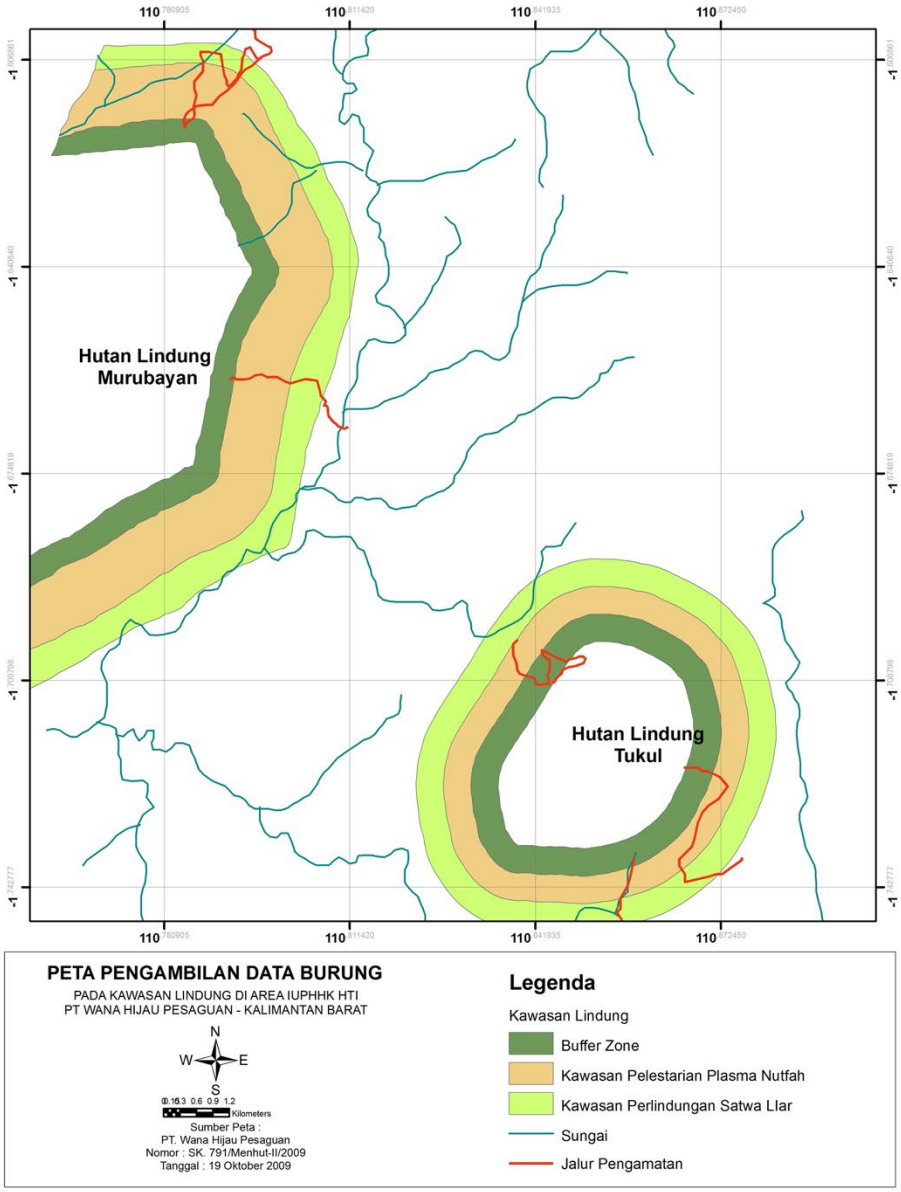


Figure 1. Site of birds observation in area of WHP in north section of Muru Bayan mounth and in south of Tukul mount

Materials and Equipment

Equipment for surveying birds in the WHP area includes field maps of the WHP area, compass, time recorder, camera with telelens, field guide book for birds of Sumatra, Kalimantan, Java and Bali (Mackinnon, 2000).

Method

Bird inventory was carried out using a combination of the transect/lane method with the IPA count method. The six transects/paths are made in the WHP area. Each transect used is 200 m long. Individual counts are based on direct observations and sounds of captured birds. Apart from that, direct observation is also used through interviews with the public or field officers who know the types of birds in the WHP area. Bird habitats were approached and described in relation to the forest types present in the study location. Vegetation is the most important component in relationships with birds

Bird Census

Six transects/paths each 200 m long are located along the riparian area observation path in the project area, which represents the habitat type or forest type. Every 50 m interval along the path of each transect is the main observation point. Every bird seen or heard was recorded for 20 minutes. This data is a quantitative parameter for the relative abundance of bird species. A daily record of bird species is always prepared to obtain additional complete inventory. Bird sounds were also recorded to clarify species identification

Interview

Semi-structured interviews were conducted with local communities around the project location to obtain additional information about bird species

Data Analysis

Data obtained from the census results are calculated using the following ecological approach formula:

Species Diversity Index
The Shanon Index described by (Magurran, 1988) is used to determine differences in bird species diversity in each transect/line

$$H = -\Sigma\, p_i \ln p_i$$

H = species diversity index, where pi is the number of individuals of type i divided by the total number of individuals of various species. Species diversity is influenced by the components of species richness and species equitability using the following formula

$$E = H/H_{max}$$

E = species equitability index
where H_{max} = - log 1/n (n = number of species in each sample plot).

Similarity Index
The Jaccard similarity index described by (Mueller-Dombois & Ellenberg 1974) shows the differences or similarities in species composition in sample observation plots

$$S = c / a+b+c$$

S = Similarity Index
a = Number of species in sample plot of a
b = Number of species in sample plot of b
c = Number of species in sample plot of a and b

The Dendrogram program was used to analyze bird community groupings in each habitat type using the Minitab SPSS 14 program

Domination

The following criteria are used for the dominance of bird species in a place

0 - 2 % = Not Dominant
2 - 5 % = Sub Dominan
> 5 % = Dominant

Domination = ni/N

ni = Individual number of i species
Ni = Individual number of total species

IV. RESULTS AND DISCUSSION

RESULT

Bird Habitat

The habitat type in the WHP area is mostly secondary forest (log over area). With 4 layers of header strata

Species Abundance

Based on the results of field observations and interviews, 88 bird species were found in the WHP area. The number of bird species is in the medium category. The abundance of bird species in a place is closely related to the type of vegetation/habitat and habitat conditions.

Table 1. Number of bird species recorded in the WHP area

Bird	Lokasi Pengamatan					
	KPSL Muru Bayan Mount	KPPN Muru Bayan Mount	Bufferzone Of Muru Bayan Mount	KPSL Tukul Mount	KPPN Tukul Mount	Bufferzone Of Tukul Mount
Species Number	51	25	21	32	38	29
Number of Family	28	15	16	20	21	18

Based on table 1, information is obtained that the richness of bird species at the observation location is highest in the Mount Muru Bayan Wildlife Conservation Area (KPSL) and the lowest is in the Mount Muru Bayan Bufferzone. Based on the results of these observations, the picture was obtained that the richness of bird species in the WHP area varied and showed significant significance. The richness of this species is related to the condition of its habitat/vegetation. In general, the type of vegetation in KPSL, KPPN and Bufferzone, both on Mount Muru Bayan and Mount Tukul, is secondary forest, but the vegetation conditions (composition, structure and dominance are different), so the species richness at each observation location has different species richness.

Bird Status

The total number of bird species found in the WHP area is presented in table 2. The number of bird species that have protected status by the Indonesian government is 21 species. The types of birds that have protected status are the Storm Stork (*Ciconia stormi*), Oriental

Honey-buzzard (*Pernis ptilorhyncus*), Crested Serpent-eagle (*Spilornis cheela*), Blyth's Hawk-Eagle (*Spizaetus alboniger*) Black-tighed Falconet (*Microhierax fringilarius*), Great Argus (*Argusianus argus*), Blue-eared Kingfisher (*Alcedo meninting*), Rufous-backed Kingfisher (*Ceyx rufidorsus*), Banded Kingfisher (*Lacedo pulchella*), White-crowned Hornbill (*Berenicornis comatus*), Wreathed Hornbill (*Aceros undulatus*), Black Hornbill (*Anthrococeros malayanus*), Buceros Hornbill (Buceros rhinoceros), Helmeted Hornbill (*Rhinoplax vigil*), Pied Fantail (*Rhipidura javanica*), Brown throated Sunbird (*Anthreptes malacensis*), Purple napped Sunbird (*Hypogramma hypogrammicum*), Olive backed Sunbird (*Cinnyris jugularis*), Purple-throated Sunbird (*Leptocoma sperata*) Little Spiderhunter (*Arachnothera longirostra*), and Spectacled Spiderhunter (*Arachnothera flavigaster)*

Table 2. Species of birds found in the WHP area

Family **Species**	**Local Name**	**Common Name**	**Observation site**						**St** **(PP,** **IU**
			1	**2**	**3**	**4**	**5**	**6**	
Ciconiidae									
1. *Ciconia stormi**	Bangau Storm	Storm Strock	1						D, TT, El
Accipitridae									
1. *Pernis ptilorhyncus**	Sikep-madu asia	Oriental Honey-buzzard	1						D, Ap II,
2. *Spilornis cheela **	Elang-ular bido	Crested Serpent-eagle	1	1		1	1		D, Ap II,
3. *Spizaetus alboniger**	Elang gunung	Blyth's Hawk-Eagle						1	D, Ap II,
Falconidae			1						
1. *Microhierax fringillarius **	Alap alap capung	Black-tighed Falconet							D, Ap II,
Phasianidae									
1. *Lophura ignita*	Sempidan biru	Crested Fireback	1						TD, TT,
2. *Argusianus argus**	Kuau raja	Great Argus		1			1		D, Ap II,
Columbidae									
1. *Treron curvirostra*	Punai lengguak	Thick-billed Green Pigeon	1	1	1				TD, TT,
2. *Ducula aenea*	Pergam hijau	Green imperial Pigeon	1						TD, TT,
3. *Chalcophaps indica*	Delimukan zamrud	Common Emerald Dove				1			TD, TT,
Psittacidae									
1.*Loriculus galgulus*	Serindit malayu	Blue crowned Hanging Parrot	1	1		1			NP, Ap II
Cuculidae									
1. *Cacomantis sonneratii*	Wiwik lurik	Banded Bay Cuckoo		1			1		TD, TT,
2. *Cacomantis merulinus*	Wiwik kelabu	Plaintive Cuckoo	1			1	1		TD, TT,
3. *Cuculus sepulcralis*	Wiwik uncuing	Rusty-breasted Cuckoo					1		TD, TT,
4. *Surniculus lugubris*	Kedasi hitam	Asian Drongo-Cuckoo	1				1	1	TD, TT,
5. *Rhinortha chlorophaeus*	Kadalayan selaya	Raffles's Malkoha	1	1		1	1		TD, TT,
6. *Zanclostomus javanicus*	Kadalan kembang	Red-billed Malkoha					1		TD, TT,
7. *Centropus sinensis*	Bubut besar	Greater Coucal			1				TD, TT,
8. *Centropus bengalensis*	Bubut alang-alang	Lesser Coucal		1					TD, TT,
Apodidae									
1. *Collocalia maxima*	Walet sarang hitam	Black nest Swiftlet	1	1	1	1	1		TD, TT,
2. *Hirundapus giganteus*	Kapinis-jarum gedang	Brown-backed Needletail	1	1					TD, TT,
Hemiprocnidae									
1. *Hemiprocne longipennis*	Tapekong Jambul	Grey rumped Tree Swift				1			TD, TT,
2.*Hemiprocne comata*	Tepekong rangkang	Whiskered Treeswift	1		1			1	TD, TT,
Trogonidae									
1. *Harpactes erythrocephalus*	Luntur putri	Red-headed Trogon					1		D, TT, L
Alcediniidae									
1. *Alcedo meninting **	Raja udang meninting	Blue-eared Kingfisher				1		1	D, TT, L
2. *Ceix rufidorsa**	Raja udang merah	Rufous-backed Kingfisher					1		D, TT, L
3. *Lacedo pulchella**	Cekaka Batu	Banded Kingfisher					1		D, TT, L
Meropidae									
1. *Merops viridis*	Kirik-kirik biru	Blue throated Bee-Eater	1			1		1	TD, TT,

2. *Nyctyornis amictus*	Cirik-cirik kumbang	Red-bearded Bee-eater					1	1	TD, TT,
Bucerotidae									
1. *Berenicornis comatus**	Enggang jambul	White-crowned Hornbill	1						D, Ap II,
2. *Aceros undulatus**	Julang emas	Wreathed Hornbill	1				1	1	D, Ap II,
3. *Anthracoceros malayanus**	Kangkareng hitam	Black Hornbill	1	1					D, Ap II,
4. *Buceros rhinoceros**	Rangkong Badak	Buceros Hornbill	1	1	1	1	1	1	D, Ap II,
5. *Rhinoplax vigil**	Rangkong gading	Helmeted Hornbill					1	1	D, Ap I,
Capitonidae									
1. *Megalaima rafflesii*	Takur tutut	Red-crowned Barbet	1	1			1	1	TD, TT,
2. *Megalaima mystacophonos*	Takur warna warni	Red throated Barbet				1	1		TD, TT,
3. *Megalaima henricii*	Takur topi emas	Yellow crowned Barbet	1		1		1		TD, TT,
4. *Megalaima australis*	Takur tenggeret	Blue eared Barbet	1	1	1	1	1	1	TD, TT,
5. *Megalaima haemacephala*	Takur ungkut-ungkut	Coppersmith Barbet	1	1					TD, TT,
6. *Calorhamphus fuliginosus*	Takur ampis	Brown Barbet	1						TD, TT,
Picidae									
1. *Sasia abnormis*	Tukik tikus	Rufous Piculet	1						TD, TT,
2.Micropternus brachyurus	Pelatuk kijang	Rufous Woodpecker				1		1	TD, TT,
3.Picus mentalis	Pelatuk kumis-kelabu	Checker-throated Woodpecker						1	TD, TT,
4.*Reinwardtipicus validus*	Pelatuk kundang	Orange backed Woodpecker						1	TD, TT,
Eurylaimidae									
1. *Eurylaimus ochromalus*	Sepur hujan darat	Black-and-yellow Broadbill	1				1	1	TD, TT,
Chloropseidae									
1. *Chloropsis sonnerati*	Cicadaun besar	Greater Green Leafbird	1				1	1	TD, TT,
2. Chloropsis cochinchinensis	Cicadaun saying-biru	Blue-winged Leafbird				1			TD, TT,
Pycnonotidae									
1. *Pycnonotus atriceps*	Cucak kuricang	Black headed Bulbul	1	1	1	1	1		TD, TT,
2. *Pycnonotus cyaniventris*	Cucak kelabu	Grey-bellied Bulbul	1						TD, TT,
3. *Pycononotus simplex*	Merbah corok-corok	Cream-vented Bulbul	1	1	1	1	1	1	TD, TT,
4. *Pycnonotus erythrophthalmos*	Merbah kacamata	Spectacled Bulbul				1		1	TD, TT,
5. *Criniger finschii*	Empuloh leher-kuning	Finsch's Bulbul					1	1	TD, TT,
6. *Tricholestes criniger*	Brinji rambut-tunggir	Hairy-backed Bulbul		1	1	1	1		TD, TT,
Dicruridae									
1. *Dicrurus leucophaeus*	Srigunting keladi	Ashy Drongo	1						TD, TT,
2. Dicrurus paradiceus	Srigunting batu	Greater racket tailed Drongo	1				1		TD, TT,
Irenidae									
1. *Irena puella*	Kacembang gadung	Fairy Blue Bird	1			1	1		TD, TT,
Corvidae									
1.*Corvus enca*	Gagak hutan	Slender-billed Crow	1	1	1				TD, TT,
2.*Pityriasis gymnocephala*	Tiongbatu kalimantan	Bornean Bristlehead						1	TD,, NT,
Timaliidae									
1.*Malacocincla sepiarium*	Pelanduk semak	Horsfield's Babbler	1		1	1			TD, TT,
2.*Malacopteron cinereum*	Asi topi-sisik	Scaly-crowned Babbler	1	1		1	1		TD, TT,
3.*Stachyris erythroptera*	Tepus merbah-sampah	Chestnut-winged Babbler	1			1		1	TD, TT,
4.*Stachyris maculata*	Tepus tunggir merah	Chestnut rumped Babbler	1						TD, TT,
5.*Macronous gularis*	Ciungair coreng	Striped Tit-Babbler	1			1		1	TD, TT,
Turdidae									
1. *Copsychus saularis*	Kucica Kampung	Magpie Robin		1					TD, TT,
2. *Copsychus malabarichus*	Murai Batu	White-rumped Shama	1	1	1		1		TD, TT,
3. *Enicurus leschenaulti*	Meninting Besar	White-crowned Forktail				1		1	TD, TT,
Sylviidae									
1. Orthotomus atrogularis	Cinenen belukar	Dark-necked Tailorbird				1			TD, TT,
2. *Orthotomus ruficeps*	Cinenen kelabu	Ashy Tailorbird	1			1	1	1	TD, TT,
3. *Orthotomus sericeus*	Cinenen Merah	Rufous-tailed Tailorbird	1		1				TD, TT,
4. *Prinia flaviventris*	Prenjak rawa	Yellow bellied Prinia		1	1	1	1		TD, TT,
Muscicapidae									
1. *Muscicapa daurica*	Sikatan Bubik	Asian Brown Flycatcher						1	TD, TT,
Rhipiduridae									
1. *Rhipidura javanica**	Kipasan Belang	Pied Fantail					1		D, TT, L
Monarchidae									
1. *Hypothymis azurea*	Kehicap Ranting	Black-naped Monarch	1						TD, TT,
2. *Tersiphone paradisi*	Sriwang Asia	Asian Paradise-flycatcher	1		1				TD, TT,
Platysteiridae									
1. *Philentoma velatum*	Philentoma kerudung	Maroon-breasted Philentoma Rufous-	1						TD, TT,
2. *Philentoma pyrhopterum*	Philentoma sayap-merah	winged Philentoma			1				TD, TT,

Sturnidae									
1. *Gracula religiosa*	Tiong Emas	Hill Myna	1	1	1				TD, TT,
Nectariniidae									
1. *Anthreptes malacensis**	Br Madu Kelapa	Brown throated Sunbird	1				1	1	D, TT, L
2. *Hypogramma hypogrammicum**	Br Madu Rimba	Purple napped Sunbird					1		D, TT, L
3. *Cinnyris jugularis **	Br Madu Sriganti	Olive backed Sunbird	1				1	1	D, TT, L
4. *Arachnothera longirostra**	Pijantung Kecil	Little Spiderhunter	1		1	1		1	D, TT, L
5. *Arachnothera flavigaster**	Pijantung tasmak	Spectacled Spiderhunter	1						D, TT, L
6. *Leptocoma sperata**	Burungmadu pengantin	Purple-throated Sunbird				1			D, TT, L
Dicaeidae									
1. *Prionochilus percusus*	Pentis Pelangi	Crimson-breasted Flowerpecker Orange		1	1		1		TD, TT,
2. *Dicaeum trigonostigma*	Br Cabe bunga api	Orange bellied Flowerpecker	1	1	1	1	1	1	TD, TT,
3. *Dicaeum chrysorrheum*	Br Caba Rimba	Yellow-vented Flowerpecker							TD, TT,
Ploceidae									
1. *Lonchura fuscans*	Bondol Kalimantan	Dusky Munia				1			TD, TT,
2. *Lonchura malacca*	Bondol Rawa	Blach-headed Munia				1			TD, TT,

Legend :

1. KPSL Gunung Muru Bayan
2.. KPPN Gunung Muru Bayan
3. Buffer Zone Gunung Muru Bayan
4. KPSL Gunung Tukul
5. KPPN Gunung Tukul
6. Buffer Zone Gunung Tukul

\+ = found in site observatio
++ = Found in many number.
Sol = Soliter
LC = Least Consern
I = Insektifforous
Pb = seed feeder
App II = Appendik II

TD = Not Dilindungi
D = Protected
E = Endemic
NT = Near Threatened
Fs = pemakan ikan
F = Frugivorous
M = Migrantory

Sr = Sering ditemukan
Jr = Jarang ditemukan
EN = Endangered
TT = Not Recorded
K = Carnivorous

Buceros Hornbill (*Buceros rhinoceros*)

Black Hornbill itam (*Anthacoceros malayanus*)

Wreathed Hornbill (*Aceros undulates*) Crested Serpent-eagle (*Spilornis cheela*)

One species of bird that is categorized as Endanger species according to the IUCN is the Storm Stork (*Ciconia stormi*), which is categorized as near threatened, Crested Fireback (*Lophura ignita*), Great Argus (*Argusianus argus*), White-crowned Hornbill (*Berenicornis comatus*), Black Hornbill (*Anthrococeros malayanus*), Buceros Hornbill (*Buceros rhinoceros*), Helmeted Hornbill (*Rhinoplax vigil*), Red-crowned Barbet (*Megalaima rafflesii*), Red throated Barbet (*Megalaima mystacophanos*), Yellow Broadbill (*Eurylaimus ochromalus*), Grey-bellied Bulbul (*Pycnonotus cyaniventris*), Finsch's Bulbul (*Criniger finschii*), Bornean Bristlehead (*Pityriasis gymnocephala*), Maroon-breasted Philentoma (*Philentoma velatum*) and Chestnut rumped Babbler (*Stachyris maculata*). Types of birds that have CITES Appendix II categories include Oriental Honey-buzzard (*Pernis ptilorhyncus*), Crested Serpent-eagle (*Spilornis cheela*), Blyth's Hawk-Eagle (*Spizaetus alboniger*) Black-tighed Falconet (*Microhierax fringilarius*), Great Argus (*Argusianus argus*), White Crown Hornbill (*Berenicornis comatus)*, Wreathed Hornbill (*Aceros undulatus*), Black Hornbill (*Anthrococeros malayanus*), Buceros Hornbill (*Buceros rhinoceros*), Blue crowned Hanging Parrot (*Loriculus galgulus*). The Helmeted Hornbill (*Rhinoplax vigil*) is listed as Appendix I

Blyth's Hawk-Eagle (*Spizaetus alboniger*)

Storm Stork (*Ciconia stormi*)

Two species of birds recorded at the WHP location as migratory birds from the Northern Hemisphere, namely Oriental Honey-buzzard (*Pernis ptilorhynchus*), and Asian Brown Flycatcher (*Muscicapa Daurica*). Two species of Kalimantan endemic birds were identified, namely the Kalimantan Bornean Bristlehead (*Pityriasis gymnocephala*), and the Dusky Munia (*Lonchura fuscans*) in the WHP area.

Bird Community Structure

The structure of the bird community can be indicated from the tropic level or bird food group. The structure of the bird community in the WHP area is as shown in the figure. The insectivorous bird group is the dominant component of the bird community structure, while the number of carnivorous bird species is small. Pyramidal food ecology indicates that the bird community in the WHP area shows normal food pyramidal conditions. This also indicates that the condition of the bird community in the WHP area is normal (Good)

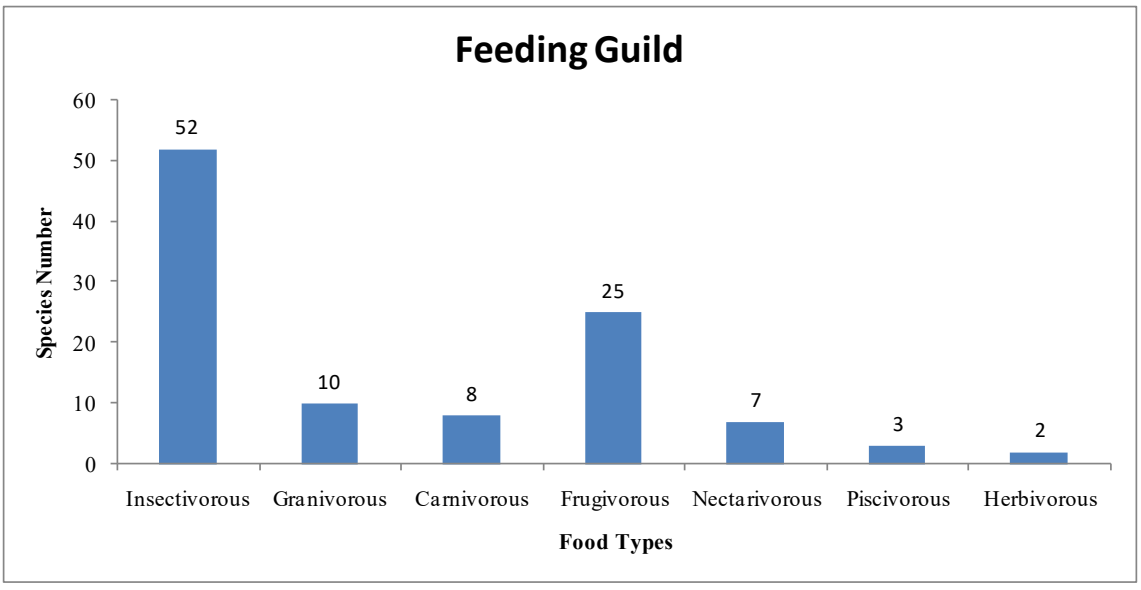


Figure 2. Diagram of bird feeding guild in the WHP area

Dominance of Bird Species

Based on the criteria for the dominance of bird species in an area, it was found that the dominance of bird species in the WHP area was as shown in table 3.

Table. 3 Level of dominance of bird species in the WHP area

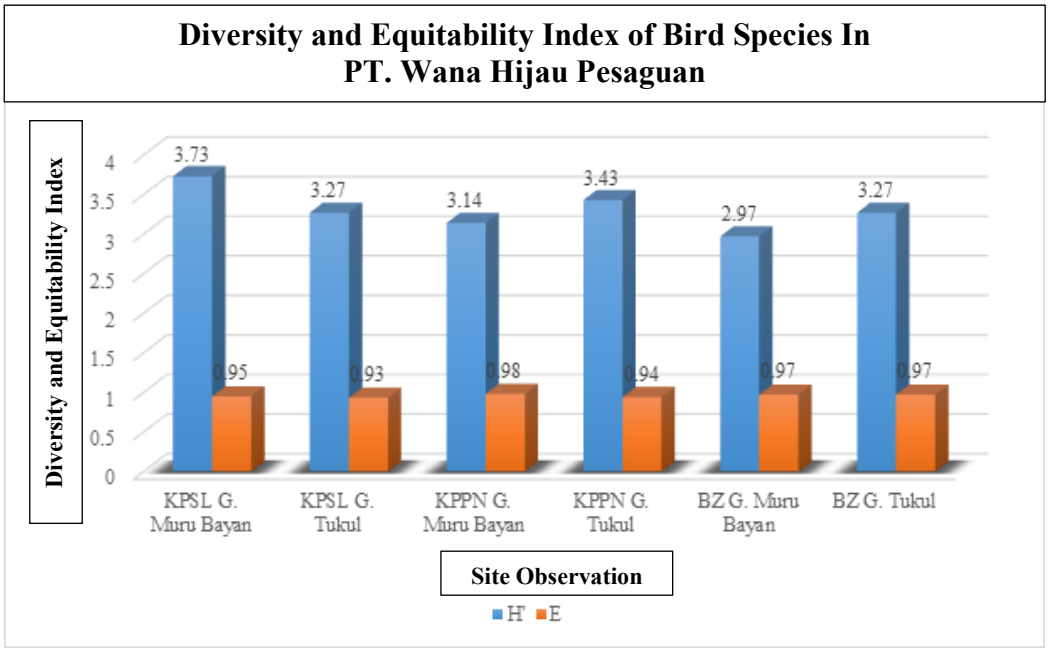
No	Domination Level	Bird Species	Information
1	Dominant	*Collocalia maxima*, Lonchura fuscans*, Lonchura Malacca*, Megalaima australis, Pycnonotus atriceps, Pycnonotus simplex, Dicaeum trigonostigma, Hemiprocne comata, Merops viridis, Macronous gularis*, Arachnothera longirostra*	* Groups, **Pair Soligter
2	Sub Dominant	*Treron curvirostra*, Chloropsis sonnerati, Corvus enca*, Orthotomus ruficeps, Hypothymis azurea, Megalaima mystacophanos, Prinia flaviventris, Cacomantis sonneratii Rhinortha chlorophaeus, Centropus bengalensis, Copsychus saularis, Copsychus malabaricus, Centropus sinensis Orthotomus sericeus, Philentoma pyrhopterum, Tersiphone paradise, Hemiprocne comata*, Nyctyornis amictus, Micropternus brachyurus, Criniger finschii, Enicurus leschenaultia, Muscicapa dauurica, Anthreptes malacensis, Cinnyris jugularis*	* Groups, **Pair Soligter
3	Not Dominant	*Pityriasis gymnocephala, Picus mentalis, Reinwardtipicus validus, Hirundapus giganteus*, Prionochilus percussus, Alcedo meninting, Pycnonotus erythrophthalmos, Malacopteron cinereum, Stachyris erythroptera, Tricholestes criniger, Chloropsis cochinchinensis, Hypogramma hypogrammicum, Rhipidura javanica, Irena puella, Eurylaimus ochromalus, Megalaima rafflesii, Rhinoplax vigil**, Aceros undulates**, Anthracoceros malayanus**, Nyctyornis amictus, Lacedo pulchella, Ceix rufidorsa, Harpactes erythrocephalus, Zanclostomus javanicus, Rhinortha chlorophaeus, Surniculus lugubris, Cuculus sepulcralis Cacomantis merulinus, Cacomantis sonneratii, Argusianus argus, Spilornis cheela, Dicaeum chrysorrheum, Leptocoma sperata, Orthotomus atrogularis, Enicurus leschenaultia, Macronous gularis, Malacocincla sepiarium, Pycnonotus erythrophthalmos, Micropternus brachyurus, Buceros rhinoceros**, Hemiprocne longipennis, Chalcophaps indica, Arachnothera flavigaster, Tersiphone paradise, Philentoma velatum Orthotomus sericeus, Macronous gularis, Stachyris erythroptera, Malacopteron cinereum, Malacocincla sepiarium, Dicrurus leucophaeus, Dicrurus paradiseus, Sasia abnormis, Calorhamphus fuliginosus*, Berenicornis comatus*, Hirundapus giganteus, Ducula aenea, Loriculus*	* Groups, **Pair Soligter

		galgulus, Lophura ignita, Microhierax fringillarius, Pernis ptilorhynchus Ciconia stormi, Spizaetus alboniger, Eurylaimus ochromalus, Gracula religiosa, Loriculus galgulus*	

Collocalia maxima, Lonchura fuscans*, Lonchura Malacca*, Megalaima australis, Pycnonotus atriceps, Pycnonotus simplex, Dicaeum trigonostigma, Hemiprocne comata, Merops viridis, Macronous gularis*, Arachnothera longirostra* are the dominant bird species in the WHP area.

Diversity of Bird Species

The diversity of bird species in the WHP area is shown by the bird species diversity index value at the observation site as in the picture. The highest bird species diversity is at the Mount Muru Bayan KPSL location while the lowest is at the Mount Muru Bayam Bufferzone location. The high and low diversity of bird species is also influenced by the habitat/vegetation conditions at that location.



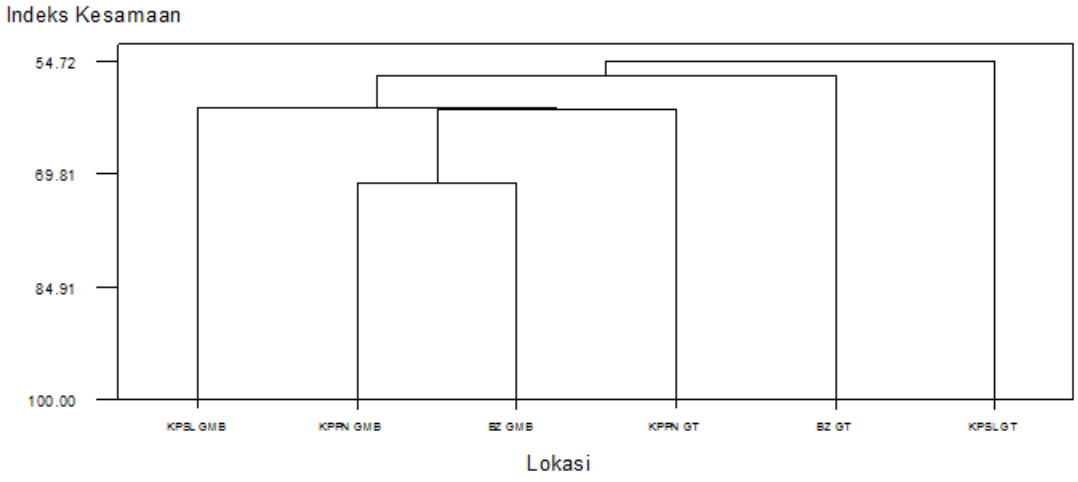
legend: H' = Species Diversity Index E = Equitability Index

Figure 3. Diagram of species diversity and evenness of bird species in the WHP area

In general, the value of bird species diversity in the WHP area is quite good (> 3), except in the Mount Muru Baya Bufferzone area. Likewise, the value of equitability/balance of species is good (> 0.90)

Similarity of Bird Communities

Based on the dendrogram analysis, the similarity of bird species communities in the WHP area can be seen in Figure 1. The similarity of bird species communities based on observation locations can be grouped into 5 as follows.
1. Group 1 is KPPN GMB – BZ GMB (Community similarity around 71.02%)
2. Group 2 is Group 1- KPPN GT (Community similarity is around 61.16%),
3. Group 3 is Group 2- KPSL GMB (Community similarity is around 60.87%)
4. Group 4 is Group 3- BZ GT (Community similarity is around 56.63%)
5 Group 5 is Group 4- KPSL GT (Community similarity around 54.72%)



KPPN GMB = Kawasan Pelastarian Plasma Nutfah Gunung Muru Bayan
BZ GMB = Bufferzone Gunung Muru Bayan
KPPN GT = Kawasan Pelestarian Plasma Nutfah Gunung Tukul
KPSL GMB = Kawasan Pelestarian Satwaliar Gunung Muru Bayan
BZ GT = Bufferzone Gunung Tukul
KPSL GT = Kawasan Pelestarian Satwaliar Gunung Tuku

Figure 4. Dendrogram of bird community similarities in the WHP are

Based on the results of the grouping analysis, it can be seen that for the KPPN GMB-BZ GMB-KPPN GT- KPSL GMB area, the similarity of bird species communities is quite large, namely around 61%, while the similarity of bird communities in the entire WHP area is around 55%.

DISCUSSION

Birds Habitat Types and Bird Diversity

It can be said that there are not many bird habitat types in the WHP area, namely only one type, namely secondary lowland forest type v vegetation. However, the results of species richness and species diversity values show significant differences. The differences in species richness and species diversity values are influenced by the habitat/vegetation conditions (Structure, Composition and Dominance) of the vegetation at each observation location. In locations that have the structure, composition and dominance of vegetation related to the fulfillment of good bird habitat components (food, protection, nesting places and places to raise offspring, fulfilled) then the value of species diversity and species richness will be high, or vice versa.

Bird Status

The number of bird species categorized as protected in the WHP area is quite high, 21 species out of 88 bird species identified (around 25%). Apart from that, around (16%) are bird species that are near threatened according to the IUCN and there is 1 type of bird that is classified as Endangered, namely the Storm Strock (Ciconia stormi) and there is 1 type that is classified as Appendix I CITES, namely the Helmeted Hornbill (Rhinoplax vigil). Two types of birds recorded at the WHP location as migrant birds from the Northern Hemisphere are the Oriental Honey-buzzard (Pernis ptilorhynchus), and the Asian Brown Flycatcher (Muscicapa Daica). Two types of birds endemic to Kalimantan were identified, namely Bornean Bristlehead (Pityriasis gymnocephala), and Dusky Munia (Lonchura fuscans) in the WHP area

Community Structure and Dominance

Most of the bird species identified in the WHP area are insect-eating birds (around 72.20%) and fruit-eating birds around 34.72%. Black nest Swiftlet (*Collocalia maxima*)*, Dusky Munia (*Lonchura fuscans*)*, Blach-headed Munia (*Lonchura malacca*)*, Blue eared Barbet (*Megalaima australis*), Black headed Bulbul (*Pycnonotus atriceps),* Cream-vented Bulbul *(Pycnonotus simplex),* Orange bellied Flowerpecker *(Dicaeu*m trigonostigma), Whiskered Treeswift (*Hemiprocne comata*), Blue throated Bee-Eater (*Merops viridis*), Striped Tit-Babbler (*Macronous gularis*), and Little Spiderhunter (*Arachnothera longirostra*) is the dominant bird species in the WHP area

Similarity of Community

Based on the results of the dendrogam analysis, 5 groups (Clusters) of similar bird species communities in the WHP area were obtained. From the results of the grouping analysis, it is clear that for the KPPN GMB-BZ GMB-KPPN GT- KPSL GMB area, the bird species

community similarity is quite large, namely around 61%, while the bird species community similarity throughout the WHP area is around 55%.

V. CONCLUSIONS & RECOMMENDATIONS

1. The richness of bird species in the WHP area is classified as moderate, with 88 bird species identified. Among these bird species, there are 21 bird species that are categorized as protected, 16 bird species are near threatened, one species is classified as endangered, 1 species is listed on CITES Appendix I. There are two species of migratory birds and 2 identified types of Kalimantan endemic birds. .

2. Bird species richness and diversity of bird species in the WHP area varies significantly. This is related to habitat conditions (availability of food, protection, breeding places)

3. The dominant type of bird in the WHP area is the insect-eating bird species and most of the bird species identified are bird species that have a fairly strong dependence on the presence of forests.

4. In order to build Industrial Planted Forest in the WHP area, data and information regarding the diversity of bird species can be used as a basis for consideration in managing the environment in the WHP area. .

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