

BUFFER ZONE MANAGEMENT IMPACT ON BIRDS ASSEMBLAGE IN THE HIGH NATURE VALUE FARMLAND (HNVf): A STUDY CASE ON MERU BETIRI NATIONAL PARK**DAMPAK PENGELOLAAN ZONA PENYANGGA PADA SUSUNAN BURUNG-BURUNG DI HIGH NATURE VALUE FARMLAND (HNVf): SEBUAH STUDI KASUS PADA TAMAN NASIONAL MERU BETIRI**Nilasari Dewi¹⁾, Agung Sih Kurnianto^{1)*}Received : March 9th, 2021Accepted : April 10th, 2021**Author Affiliation:**

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ABSTRACT

This study aims to analyze the distribution of bird communities and the impact of vegetation on bird habitat preferences in the buffer zone. Research is carried out in agricultural areas in the Buffer zone, Rehabilitation Zone, and on the edge of the plantation. The research location was determined at 37 points: Rajekwesi (4), Sukamade (12), Bandalit (8), Wonoasri (5), Andongrejo (3), Sanenrejo (5). We applied the point count method ($r = 17.5$ m) in this study, where each point is at least 100-150 meters apart. In the study, 74.6% of records were birds with agricultural specialities and 71.30% of individuals on tree habitats. Birds with specialization in agriculture were found in large numbers related to the protection provided by the TNMB conservation area to bird habitat. Sukamade is the area with the highest number of records. As many as 40.10% were found in tree habitats followed by seedling (16.28%), poles (15.93%), flying over (15.76%), and sapling (11.90%).

Keywords: birds, buffer zone, HNVf, MBNP

ABSTRAK

Penelitian ini bertujuan untuk menganalisis distribusi komunitas burung dan dampak vegetasi pada preferensi habitat di zona penyangga. Penelitian dilakukan di areal pertanian di Zona Penyangga, Zona Rehabilitasi, dan di pinggir perkebunan. Lokasi penelitian ditentukan di 37 titik yaitu Rajekwesi (4), Sukamade (12), Bandalit (8), Wonoasri (5), Andongrejo (3), Sanenrejo (5). Kami menerapkan metode hitung titik ($r = 17,5$ m) dalam penelitian ini, di mana setiap titik setidaknya berjarak 100-150 meter. Dalam studi tersebut, 74,6% dari catatan adalah burung dengan spesialisasi pertanian dan 71,30% individu yang menggunakan habitat pohon. Burung dengan spesialisasi di bidang pertanian banyak ditemukan terkait dengan perlindungan yang diberikan kawasan konservasi TNMB terhadap habitat burung. Sukamade merupakan kawasan dengan jumlah pencatatan terbanyak. Sebanyak 40,10% ditemukan di habitat pohon, disusul seedling (16,28%), poles (15,93%), flying over (15,76%), dan sapling (11,90%).

Kata kunci: burung, HNVf, TNMB, zona penyangga

INTRODUCTION

Buffer zones are unique in their potential function of supporting protected areas. The emergence of problems generally comes from the economic and social needs of the managing community [1]. Meru Betiri National Park (MBNP) is unique, where agricultural areas support forest conservation and are managed traditionally to create sustainable management. There are two plantation companies in the national park that have quite a large area, thus

giving an agricultural effect to this conservation area. MBNP is also directly adjacent to residential and agricultural pockets that provide urban influences in a rehabilitation zone. Low-intensity characteristics of traditional farming systems are associated with high biodiversity, especially in conservation areas.

HNV farmland is a land definition idea that began in the 1990s, where there was an increase in the conversion of forest

degradation to agricultural areas and settlements so that the role of conservation areas emerged in agricultural areas [2]. Low intensive and traditionally managed agriculture is one of the characteristics of the HNV agricultural area. The development of HNV agricultural research concluded the definitions of the three types of HNV agriculture proposed in 2004: 1) Agricultural areas with a high proportion of semi-natural vegetation, 2) Agricultural areas with mozaic from low-intensity agricultural areas and buffer elements and nature, such as field margins, hedgerows, stone walls, patches of timber or shrubland areas, streams, etc., 3) Agricultural areas that support endangered species or world population or high regional [2]. Based on this definition, the MBNP Buffer Zone is an HNVf area, and a study is needed to analyze the distribution of bird communities and the impact of vegetation on bird habitat preferences in the buffer zone. Bird communities are an important indicator of HNVf and illustrate the role of these areas to support MBNP conservation areas.

To achieve this aim, systematic research is carried out on agricultural areas. The results of the analysis focus on the distribution of trends and geographic distributions and focus on

evaluating the quality of the diversity under investigation. Based on these records, potential knowledge gaps in the HNVf study will be explored, which can be useful in future knowledge challenges, which will contribute to the development of HNVf that maintains biodiversity.

METHODS

Study area. Research is carried out in agricultural areas in the buffer zone, rehabilitation zone, and on the edge of the plantation. The research location was determined at 37 points: Rajekwesi (4), Sukamade (12), Bandalit (8), Wonoasri (5), Andongrejo (3), Sanenrejo (5), see Figure 1 We estimated the vegetation composition of the observed area using a map grid (10x10m), where the results represent the average percentage of land cover at the observation points (see Table 1).

Vegetation type were then categorized based on: seedling h: 0-1.5 m, sapling h: ≥ 1.5 m, d: 10 cm, poles d: 10-20 cm, tree d: >20 cm (h: height, d: diameter). Birds that did not perch but fly among the vegetation were more pronounced as flyovers.

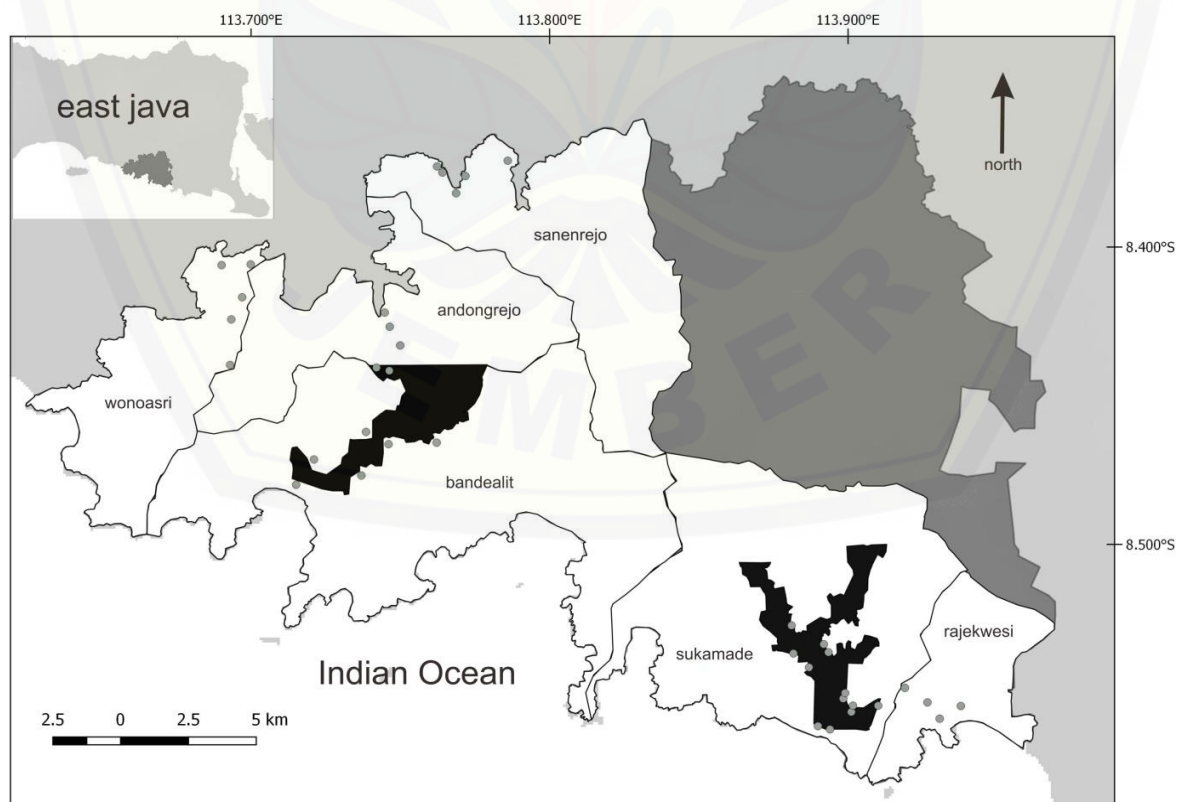


Figure 1. Map of Meru Betiri National Park, study points, and observed resorts. Keys = light grey: areas outside the national park; dark grey: Unobserved resorts; black: plantation company area

Table 1. Vegetation cover and land management at total observation points (%)

	Rajekwesi	Sanenrejo	Andongrejo	Wonosari	Bandealit	Sukamade
Agroforestry	53,7	17,3	39	22,7	42,7	19,3
Hedgerows	16,8	25,7	61	46,6	11	26,3
Cover crops	29,5	0	0	30,3	46,2	37,7
Rainfed	0	56,8	0	0	0	16,3

Birds survey. We applied the point count method ($r = 17.5$ m) in this study, where each point was at least 100-150 meters apart. The survey was conducted weekly for 15 minutes between 06.00-09.00 am, which was the best active behaviour time for most birds. We recorded a bird that was observed or heard at each point. We avoided work during rainy, cloudy, windy, or foggy days. Birds that had a relationship with the observation location but not perched were classified under flying over (FO). We used a Bushnell 10x70x70 binocular to identify bird species, a Canon EOS 1100 D + 300 mm camera Canon Lens for taking photos, and a Sony ICD-PX40 digital recorder to record bird sounds. Birds were identified by a bird identification field guide book [3]. We confirmed bird sounds by comparing them to the online xeno-canto bird sound database (<http://xeno-canto.org>).

Data analysis. The bird identification data were then tabulated with Microsoft Excel 2007, then classified based on species, family, conservation status, protection, and specialists in forest, forest edge, agriculture, or urban habitats [3].

RESULTS AND DISCUSSION

During the point count at 37 points, we observed a total of 2135 birds comprising 156 species (Table S1, supplementary material). Among them, there were 31 forest specialists (439 individuals), 33 forest edge specialist species (158 individuals), 73 specialist agricultural bird species (1095 individuals), and 13 urban area specialist birds (427 individuals). Three hundred and forty-five individuals flew over the observation point; 365 individuals were observed using the pole vegetation level, 152 individuals using the sapling level, 359 using the seedling vegetation level, and 898 using the tree vegetation level (see Figure 2). There were three species that had near threatened status, three species had vulnerable status, and one species with endangered status. There were 30 species that are included in Indonesia's conservation

protection, and 13 bird species had international trade protection (see Table 2).

Relative importance of HNV farmland for bird. The importance values index (IVI) varies by species (see Table 2). The Cave Swiftlet was present to dominate and become an important species of all observed habitats (IVI = 10.95). Coppersmith Barbet followed with a value of IVI = 8.45, and next was the Gray-cheeked Green-pigeon (IVI = 5.33).

A total of 284 records, or covering 54% of birds in Rajekwesi recorded used agroforest habitat. In Sanenrejo, as many as 88 individuals, or 56% of the birds found used rainfeds. A total of 142 individuals, or 61% of the total birds found in Andongrejo had a habitat in hedgerows. The same evidence was found in Wonoasri, where 43 individuals or 46% of the total record, had habitat in hedgerows. On Sukamade, cover crops were the habitats most visited by birds, with 216 records, or 37% (see Figure 3).

In general, agroforestry systems with a mixture of crops, such as coconut (*Cocos nucifera*) or sengon (*Falcataria moluccana*) and other commodity crops underneath, were preferred by birds, compared to other monocultures rainfed or cover crops, like cassava, corn, and bean. All three had uniform vegetation types and tend not to provide suitable microhabitat, equal and low canopy height. This made insectivores and carnivores concentrated on several edges that had a combination of vegetation with a higher canopy. Canopy diversity had been shown to have a positive effect on bird diversity. The results showed that the canopy in the middle had the highest number of birds [4]. Next, the mixed area, which was more than two types of plants, provided a habitat role for a limited number of forest specialists, such as Olive-winged Bulbul, Yellow-vented flowerpecker, Wreathed hornbill, Javan-hawk Eagle, Rufous-bellied Eagle, Sunda Coucal [3, 5].

Plant canopy in the constituent agroecosystem gave preference to bird activity, including for protection. The intensity of utilization by birds was supported by the

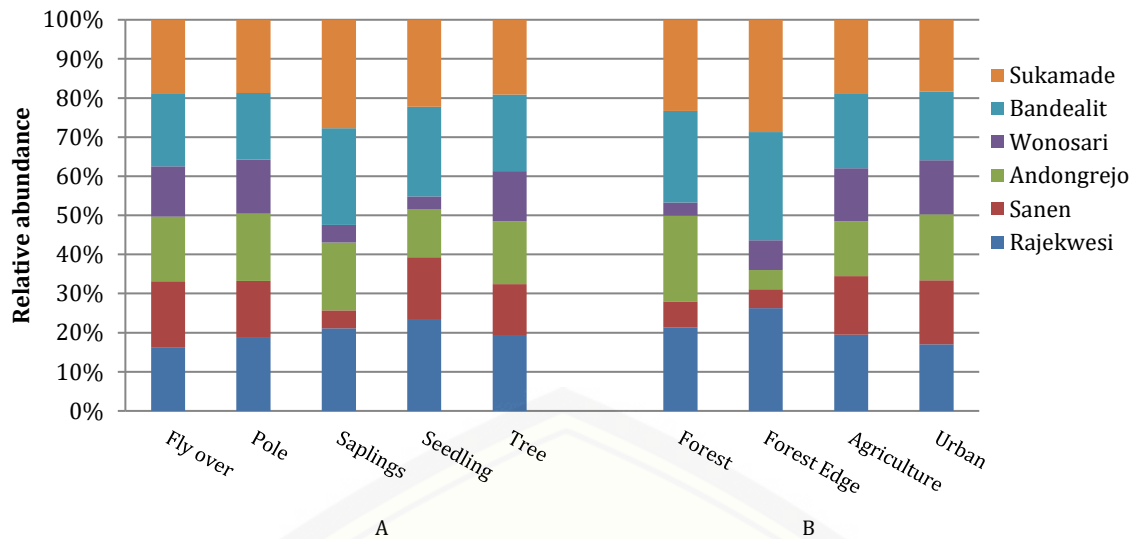


Figure 2. Comparison of relative abundance of birds in each area classified by vegetation type (A) and bird speciality (B)

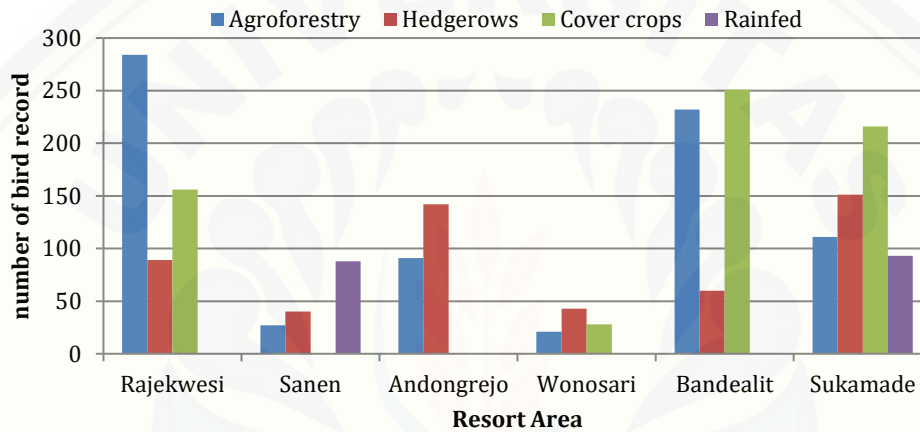


Figure 3. Number of birds finds in each resort area based on land type and vegetation

availability of various foods sources in the agroecosystem. The emergence of communal roosting in the agroecosystem showed the activities carried out for several generations. Based on a comparison of the records in each resort area, agriculture and urban specialist birds had a unique capacity to adapt to most research areas (Figure 2B). These bird species had the ability to forage on forest edges and in urban areas, although there was less clear interception with urban specialists. One of the species with the highest IVI value was Coppersmith Barbet *Megalaima haemacephala* (see table 2). This bird was a frugivore that had a second large number and was adapted to forest areas, edges, as well as in plantation and agricultural areas. In addition, agriculture specialists got benefit from their food, which was available in abundance in open areas and forest edges, where this type of area was covered very widely. Javan Hawk-Eagle was one of the iconic, endemic, and rare species in TNMB. The limited distribution includes

conservation areas mainly because of its dependence on the natural forest as its breeding territory. However, now most of their lives were supported by open areas as prey providers, especially agricultural areas [5]. Green Peafowl was a protected species that required open areas for foraging activities. However, they required protection in woody vegetation at night [6].

Urban birds were often present in residential areas and look for food leftovers from human activities [7] and had the ability to foraging in agricultural areas [8]. Other than that, the Cave Swiftlet *Collocalia linchi* also had the ability to adapt in almost all research areas so that it had the highest IVI (see Table 2). This species was an insectivore that grabs its prey in groups while flying. This was supported by its anatomical system, which had no cache [9]. Its large number in most areas also affected the use of habitat by flyover (see Figure 2).

Table 2. The seven taxa with highest Important Value Index (IVI) and records of endangered and protected birds. Keys = Freq: Frequency, Abund. : Abundance, Div. : Shannon-Wiener Diversity Index, IVI: Important Value Index, Spec. : Bird Specialist, Ur: urban; Ag: Agroforest; F: Farmland; Fo: Forest; He: Hedgerows, IUCN: global conservation status (<https://www.iucnredlist.org/>), Protection: Permen LHK P.20 (A) and B CITES international trade agreement of endangered species (<https://cites.org/eng/app/index.php>)

Name/Species	Freq.	Abund.	Div.	IVI	Spec.	IUCN	Protection
Cave Swiftlet/ <i>Collocalia linchi</i>	1.84	9.10	6.53	10.95	Ur	Lc	
Coppersmith Barbet/ <i>Megalaima haemacephala</i>	1.84	6.60	3.54	8.45	Ag	Lc	
Grey-cheeked Green-pigeon/ <i>Treron griseicauda</i>	1.23	4.10	-1.09	5.33	Fo	Lc	
Yellow-vented Bulbul/ <i>Pycnonotus goiavier</i>	1.53	3.68	-0.75	5.21	Fo	Lc	
Sooty-headed Bulbul/ <i>Pycnonotus aurigaster</i>	1.84	3.35	-0.51	5.19	Ur	Lc	
Javan Munia/ <i>Lonchura leucogastroides</i>	0.92	3.35	-0.51	4.27	Ag	Lc	
Blue-eared barbet/ <i>Psilopogon australis</i>	1.23	3.02	-0.51	4.25	Ag	Lc	A
Threatened and protected bird							
Crested Goshawk/ <i>Accipiter trivirgatus</i>	0.61	0.14	0.23	0.75	He	Lc	A.B
Black Eagle/ <i>Ictinaetus malaiensis</i>	0.31	0.04	0.10	0.35	F	Lc	A.B
White-bellied Sea-eagle/ <i>Haliaeetus leucogaster</i>	0.61	0.09	0.17	0.70	He	Lc	A.B
Crested-serpent Eagle/ <i>Spilornis cheela</i>	1.53	0.66	0.50	2.19	F	Lc	A.B
Javan Hawk-eagle/ <i>Nisaetus bartelsi</i>	0.61	0.09	0.17	0.70	F	En	A.B
Rufous-bellied Eagle/ <i>Lopotriorchis kienerii</i>	0.92	0.14	0.23	1.06	F	Lc	A.B
Honey-buzzard/ <i>Pernis ptilorhynchus</i>	0.92	0.18	0.27	1.11	F	Lc	A.B
Oriental-pied Hornbill/ <i>Anthraceros albirostris</i>	0.61	1.69	0.39	2.31	Fo	Lc	A.B
Wreathed Hornbill/ <i>Rhyticeros undulatus</i>	0.92	2.12	0.22	3.04	Fo	Lc	A.B
Rhinoceros Hornbill/ <i>Buceros rhinoceros</i>	0.92	0.37	0.40	1.30	Fo	Vu	A.B
Javan Coucal/ <i>Centropus nigrorufus</i>	0.61	0.09	0.17	0.70	F	Vu	A
Black-banded Barbet/ <i>Psilopogon javensis</i>	0.92	2.64	-0.04	3.56	Fo	Nt	A
Olive-backed Sunbird/ <i>Cinnyris jugularis</i>	1.53	1.74	0.37	3.28	F	Lc	
Dark-throated oriole/ <i>Oriolus xanthonotus</i>	0.61	0.18	0.27	0.80	Fo	Nt	
Green Peafowl/ <i>Pavo muticus</i>	0.30	0.18	0.27	0.49	He	Vu	A.B
Javan Flameback/ <i>Chrysocolaptes strictus</i>	0.61	0.09	0.17	0.70	Fo	Vu	
Yellow-throated Hanging-parrot/ <i>Loriculus pusillus</i>	0.92	1.03	0.52	1.96	He	Nt	A.B
Sunda-pied Fantail/ <i>Rhipidura javanica</i>	0.92	0.28	0.35	1.20	F	Lc	A

Coconut and sengon were combined cover crops in the agroforestry system found in MBNP. These trees were common in all land cover types and became the most preferred habitat for daily activities. However, figs trees (*Ficus* sp.) gave more role in the cover crops system than other types of trees. All observation locations had figs, and it invited bird communities to engage in activities in the canopy and around it. The bird composition observed included insectivores, frugivores, and omnivores. Apart from activities in the canopy, it was noted that the fig tree provided perches for beneficial bird communities, such as insectivores and nectarivorous for longer activities in the surrounding agricultural areas.

Agricultural areas with traditional agroforest management were the most popular habitat for birds. This was interesting, where the contribution of culture on traditional agroforestry was large [10] and consisted of various types of vegetation that can attract various species of birds with many specialities. Agroforests were able to attract various types of animals to use them as a place of activity [8]. This was evident in various types of traditional agroforestry management in Java and Sumatra, which were used as a variety of bird habitats, small mammals to large mammals such as elephants and Sumatran tigers [10]. However, agroforestry management in TNMB is limited to semi-

traditional management by utilizing rehabilitated land [11]. The management did not use an adequate irrigation system and only relies on various dryland commodities, like bananas and coffee. Other than that, jackfruit (*Artocarpus heterophyllus*) and pete (*Parkia speciosa*) were common plants at Resort Wonoasri [12].

The high complexity of the role of birds was seen in agroforest areas ranging from frugivores, insectivores, and observable carnivores. Frugivores were observed to make greater use of some of the fig trees owned by the national park. It played an essential role in spreading tree seeds in areas with fragmented landscapes [13]. Its movement to heterogeneous landscapes also had an impact on the land cover [14]. Insectivores arise because of the open area and cultivation of agricultural systems in them. It doesn't not only invite insectivores from urban or agriculture specialists but also omnivores such as the Eurasian Sparrow (*Passer montanus*).

Coconut plantations were mostly visited by nectarivore, which sucks nectar from coconut flowers. Multiple activities, although quite rare, Javan Kingfisher *Halcyon cyanoventris* basking on the branch. Other than that, some birds, such as the common Spotted Dove (*Spilopelia chinensis*) took advantage of the height of the coconut tree for nesting. The wide canopy on the coconut served as a protection for the nest from predators. The preference for coconut trees as a roosting activity might be related to the height plant structure, thus providing protection from enemies. Multiple authors reported foraging activity, breeding, and roosting in seven orders: Ciconiiformes, Gruiformes, Psittaciformes, Cuculiformes, Coraciiformes, Turniciformes, Passeriformes [15].

The agricultural management system in the MBNP buffer zone provided an overview of a variety of bird assemblage. Agroforestry, which was one type of management, had become the best habitat for bird and had been confirmed to had various benefits related to sustainable agricultural practices. [16]. This assemblage of birds showed the importance of the buffer zone as HNVf supporting conservation in the MBNP area.

CONCLUSION

The MBNP buffer zone had four types of vegetation cover and management. Sukamade was the area with the highest number of records. Agroforestry was the type of

management most visited by birds. Most of the birds recorded were agricultural specialists and use stratum levels of tree vegetation. The combination of coconut and sengon, as well as the crops below, attracts birds. In other, more open management type, figs are a major draw for birds to visit.

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Table S1. Birds checklist on study Site. Keys = IUCN: global conservation status (<https://www.iucnredlist.org/>), Law: Permen LHK P.20,CITES: international trade agreement of endangered species (<https://cites.org/eng/app/index.php>)

No	Nama Indonesia	English	Scientific Name	IUCN			Law	Appendix	CITES	Resort Area					
				NT	Vu	En				Rajekwesi	Sanen	Andongrejo	Wonosari	Bandealit	Sukamade
1	Remetuk Laut	Golden-bellied gerygone	<i>Gerygone sulphurea</i>											1	3
2	Elang Alap Jambul	Crested goshawk	<i>Accipiter trivirgatus</i>				√	√	√					2	1
3	Elang Hitam	Black eagle	<i>Ictinaetus malaiensis</i>				√	√	√					1	
4	Elang Laut Perut Putih	White-bellied sea eagle	<i>Haliaeetus leucogaster</i>				√	√	√					1	1
5	Elang Ular Bido	Crested serpent eagle	<i>Spilornis cheela</i>				√	√	√	2	3	3		2	4
6	Elang Jawa	Javan hawk-eagle	<i>Nisaetus bartelsi</i>			√	√	√	√					1	1
7	Elang Brontok	Changeable hawk-eagle	<i>Nisaetus cirrhatus</i>				√						1	1	1
8	Elang Bondol	Brahminy kite	<i>Haliastur indus</i>				√					1			
9	Elang-perut Karat	Rufous-bellied eagle	<i>Lophotriorchis kienerii</i>				√	√	√	1				1	1
10	Sikep-madu Asia	Crested honey buzzard	<i>Pernis ptilorhynchus</i>				√	√	√	1				1	2
11	Cipoh Kacat	Common iora	<i>Aegithina tiphia</i>							16				12	5
12	Cekakak Sungai	Collared kingfisher	<i>Todiramphus chloris</i>							6			2	2	12
13	Cekakak Jawa	Javan kingfisher	<i>Halcyon cyanoventris</i>							2	5			1	5
14	Cekakak Batu	Banded kingfisher	<i>Lacedo pulchella</i>											1	
15	Cekakak Suci	Sacred kingfisher	<i>Todiramphus sanctus</i>											1	1
16	Udang Api	Rufous-backed Kingfisher	<i>Ceyx rufidorsa</i>											2	1
17	Raja-udang Meninting	Blue-eared kingfisher	<i>Alcedo meninting</i>											1	2
18	Walet Linci	Cave swiftlet	<i>Collocalia linchi</i>							42	34	45	15	34	23
19	Kapinis Rumah	House swift	<i>Apus nipalensis</i>											2	2
20	Walet Sapi	Glossy swiftlet	<i>Collocalia esculenta</i>												1
21	Kokokan Laut	Striated heron	<i>Butorides striata</i>											5	2
22	Cangak Merah	Purple heron	<i>Ardea purpurea</i>											2	2
23	Cangak Abu	Grey heron	<i>Ardea cinerea</i>											1	
24	Blekok Sawah	Javan pond heron	<i>Ardeola speciosa</i>												2
25	Kuntul Karang	Pacific reef heron	<i>Egretta sacra</i>											2	2
26	Kuntul Kecil	Little egret	<i>Egretta garzetta</i>												1
27	Kuntul Kerbau	Cattle egret	<i>Bubulcus ibis</i>												2
28	Kowak Malam Abu	Black-crowned night heron	<i>Nycticorax nycticorax</i>											4	5
29	Kekep Babi	White-breasted woodswallow	<i>Artamus leucorhynchus</i>							6				2	1
30	Kangkareng Perut Putih	Oriental pied hornbill	<i>Anthracoceros albirostris</i>				√	√	√					19	17
31	Julang Emas	Wreathed hornbill	<i>Rhyticeros undulatus</i>				√	√	√			16		16	13
32	Eggang Cula	Rhinoceros hornbill	<i>Buceros rhinoceros</i>				√	√	√	4				2	2
33	Sepah Kecil	Small minivet	<i>Pericrocotus cinnamomeus</i>							16				16	15
34	Sepah Hutan	Orange minivet	<i>Pericrocotus flammeus</i>							12				15	12
35	Sepah Gunung	Sunda minivet	<i>Pericrocotus miniatus</i>											2	
36	Kapasan Sayap Putih	White-shouldered triller	<i>Lalage sueurii</i>									23		5	
37	Kepudang-sungu Jawa	Javan cuckooshrike	<i>Coracina javensis</i>											2	2
38	Kepudang-sungu Kecil	Lesser cuckooshrike	<i>Coracina fimbriata</i>											1	1
39	Cabak Maling	Large-tailed nightjar	<i>Caprimulgus macrurus</i>											1	
40	Cabak Kota	Savanna nightjar	<i>Caprimulgus affinis</i>												4
41	Cerek Jawa	Javan plover	<i>Charadrius javanicus</i>				√							2	2
42	Cica Daun Sayap Biru	Blue-winged leafbird	<i>Chloropsis cochinchinensis</i>				√								1
43	Bangau Sendang Lawe	Woolly-necked stork	<i>Ciconia episcopus</i>				√				3	2	1	4	2
44	Bangau Tongtong	Lesser adjutant	<i>Leptoptilos javanicus</i>				√								
45	Cici Padi	Zitting cisticola	<i>Cisticola juncidis</i>							23	12				6
46	Perenjak Jawa	Bar-winged prinia	<i>Prinia familiaris</i>								13			23	2

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47	Cinenen Jawa	Olive-backed tailorbird	<i>Orthotomus sepium</i>						6		14			1	6
48	Cinenen Pisang	Common tailorbird	<i>Orthotomus sutorius</i>											6	2
49	Cinenen Kelabu	Ashy tailorbird	<i>Orthotomus ruficeps</i>											12	1
50	Delimukan Zamrud	Common emerald dove	<i>Chalcophaps indica</i>											1	1
51	Dederuk Jawa	Sunda collared dove	<i>Streptopelia bitorquata</i>												1
52	Tekukur Biasa	Spotted dove	<i>Spilopelia chinensis</i>						19					2	6
53	Walik Kembang	Black-naped fruit dove	<i>Ptilinopus melanospilus</i>											14	
54	Perkutut Jawa	Zebra dove	<i>Geopelia striata</i>												1
55	Punai Penganten	Grey-cheeked green pigeon	<i>Treron griseicauda</i>						21		25			16	25
56	Punai Siam	Orange-breasted green pigeon	<i>Treron bicinctus</i>												1
57	Uncal Buau	Ruddy cuckoo-dove	<i>Macropygia emiliana</i>												2
58	Uncal Kouran	Little cuckoo-dove	<i>Macropygia ruficeps</i>												1
59	Pergam Hijau	Green imperial pigeon	<i>Ducula aenea</i>						3						
60	Tiong-lampu Biasa	Oriental dollarbird	<i>Eurystomus orientalis</i>											2	2
61	Gagak Hutan	Slender-billed crow	<i>Corvus enca</i>						6					18	13
62	Tangkar Centrong	Racket-tailed treepie	<i>Crypsirina temia</i>											2	6
63	Bubut Alang-alang	Lesser coucal	<i>Centropus bengalensis</i>									2		6	5
64	Bubut Jawa	Sunda coucal	<i>Centropus nigrorufus</i>			√		√						1	1
65	Bubut Besar	Greater coucal	<i>Centropus sinensis</i>												1
66	Wiwik Lurik	Banded bay cuckoo	<i>Cacomantis sonneratii</i>						4					1	2
67	Wiwik Kelabu	Plaintive cuckoo	<i>Cacomantis merulinus</i>											2	2
68	Wiwik Uncuing	Rusty-breasted cuckoo	<i>Cacomantis sepulchralis</i>												1
69	Kedasi Ungu	Violet cuckoo	<i>Chrysococcyx xanthorhynchus</i>											1	
70	Kangkak Ranting	Himalayan cuckoo	<i>Cuculus saturatus</i>												2
71	Kedasi Hitam	Square-tailed drongo-cuckoo	<i>Surniculus lugubris</i>											1	2
72	Kadalan Birah	Chestnut-breasted malkoha	<i>Phaenicophaeus curvirostris</i>											2	
73	Kadalan Kembang	Red-billed malkoha	<i>Phaenicophaeus javanicus</i>											1	1
74	Cabai Jawa	Scarlet-headed flowerpecker	<i>Dicaeum trochileum</i>											5	2
75	Cabai Rimba	Yellow-vented flowerpecker	<i>Dicaeum chrysorrheum</i>								2				
76	Cabai Bunga-api	Orange-bellied flowerpecker	<i>Dicaeum trigonostigma</i>												2
77	Srigunting Batu	Greater racket-tailed drongo	<i>Dicrurus paradiseus</i>											14	13
78	Srigunting Hitam	Black drongo	<i>Dicrurus macrocerus</i>											1	1
79	Bondol Jawa	Javan munia	<i>Lonchura leucogastroides</i>						34					21	16
80	Bondol Peking	Scaly-breasted munia	<i>Lonchura punctulata</i>						19					19	12
81	Bondol haji	White-headed munia	<i>Lonchura maja</i>											12	1
82	Sempur Hujan Rimba	Banded broadbill	<i>Eurylaimus javanicus</i>											2	1
83	Alap-alap Sapi	Spotted kestrel	<i>Falco moluccensis</i>					√	2					1	1
84	Alap-alap Capung	Black-thighed falconet	<i>Microhierax fringillarius</i>											2	2
85	Alap-alap Kawah	Peregrine falcon	<i>Falco peregrinus</i>					√						1	1
86	Tepekong Jambul	Grey-rumped treeswift	<i>Hemiprocne longipennis</i>						19		3			6	2
87	Layang-layang Batu	Pacific swallow	<i>Hirundo tahitica</i>											6	34
88	Layang-layang Loreng	Striated swallow	<i>Cecropis striolata</i>											7	1
89	Layang-layang Api	Barn Swallow	<i>Hirundo rustica</i>								14		4	12	9
90	Bentet Kelabu	Long-tailed shrike	<i>Lanius schach</i>						12					2	2
91	Cica-koreng Jawa	Striated grassbird	<i>Megalurus palustris</i>						17						1
92	Takur Tulung Tumpuk	Black-banded barbet	<i>Megalaima javensis</i>			√		√	23					19	14
93	Takur Bultok	Lineated barbet	<i>Megalaima lineata</i>												1
94	Takur Ungkut-ungkut	Coppersmith barbet	<i>Megalaima haemacephala</i>						54	19	23	16		12	16
95	Takur Tenggeret	Blue-eared barbet	<i>Psilopogon cyanotis</i>						18		12			21	13
96	Kirik-kirik Senja	Chestnut-headed bee-eater	<i>Merops leschenaulti</i>						21	6				6	10

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97	Kehicap Ranting	Black-naped monarch	<i>Hypothymis azurea</i>												2
98	Kicuit Kerbau	Western Yellow Wagtail	<i>Motacilla flava</i>												2
99	Sikatan Cacing	Hill blue flycatcher	<i>Cyornis banyumas</i>												1
100	Meninting Besar	White-crowned forktail	<i>Enicurus leschenaulti</i>												1
101	Meninting Kecil	Sunda forktail	<i>Enicurus velatus</i>												1
102	Burung Madu Sriganti	Olive-backed sunbird	<i>Cinnyris jugularis</i>												2
103	Burung Madu Kelapa	Brown-throated sunbird	<i>Anthreptes malacensis</i>						4		5	6	12	12	1
104	Burungmadu Belukar	Ruby-cheeked sunbird	<i>Chalcoparia singalensis</i>												1
105	Burung-madu Sepah-Raja	Crimson sunbird	<i>Aethopyga siparaja</i>					√							1
106	Burung-madu Jawa	Javan sunbird	<i>Aethopyga mystacalis</i>					√							1
107	Pijantung Kecil	Little spiderhunter	<i>Arachnothera longirostra</i>												1
108	Pijantung Gunung	Streaky-breasted spiderhunter	<i>Arachnothera affinis</i>												2
109	Pijantung Besar	Long-billed spiderhunter	<i>Arachnothera robusta</i>												2
110	Kepudang Kuduk-hitam	Black-naped oriole	<i>Oriolus chinensis</i>												1
111	Kepudang Hutan	Dark-throated oriole	<i>Oriolus xanthonotus</i>		√										2
112	Kacembang Gadung	Asian fairy-bluebird	<i>Irena puella</i>												1
113	Burung Gereja Erasia	Eurasian tree sparrow	<i>Passer montanus</i>												2
114	Pelanduk Semak	Horsfield's babbler	<i>Malacocincla sepiaria</i>							5					1
115	Pelanduk Topi Hitam	Black-capped babbler	<i>Pellorneum capistratum</i>												2
116	Ayam Hutan Hijau	Green junglefowl	<i>Gallus varius</i>						12						8
117	Ayam Hutan Merah	Red junglefowl	<i>Gallus gallus</i>												1
118	Merak Hijau	Green peafowl	<i>Pavo muticus</i>		√		√	√							4
119	Pelatuk Ayam	White-bellied woodpecker	<i>Dryocopus javensis</i>												2
120	Pelatuk Sayap merah	Crimson-winged woodpecker	<i>Picus puniceus</i>												2
121	Pelatuk Tunggir-emas	Greater flameback	<i>Chrysocolaptes guttacristatus</i>		√										1
122	Pelatuk Besi	Common flameback	<i>Dinopium javanense</i>												1
123	Pelatuk Kelabu Besar	Great slaty woodpecker	<i>Mulleripicus pulverulentus</i>												1
124	Caladi Tilik	Sunda pygmy woodpecker	<i>Dendrocopos moluccensis</i>												2
125	Caladi Ulam	Fulvous-breasted woodpecker	<i>Dendrocopos macei</i>						2		21	2			3
126	Caladi Tikotok	grey-and-buff woodpecker	<i>Hemicircus sordidus</i>												1
127	Paok Pancawarna	Javan banded pitta	<i>Hydrornis guajana</i>					√		3					5
128	Manyar Jambul	Streaked weaver	<i>Ploceus manyar</i>												21
129	Paruh-kodok Jawa	Javan frogmouth	<i>Batrachostomus javensis</i>												2
130	Serindit Jawa	Yellow-throated hanging parrot	<i>Loriculus pusillus</i>		√		√	√		14					6
131	Merbah Cerucuk	Yellow-vented bulbul	<i>Pycnonotus goiavier</i>						16		4	42			3
132	Cuca Kutulang	Sooty-headed bulbul	<i>Pycnonotus aurigaster</i>						14		14	12	14		1
133	Cuca Kuricang	Black-headed bulbul	<i>Pycnonotus atriceps</i>												2
134	Cuca Kuning	Black-capped bulbul	<i>Pycnonotus melanicterus</i>						16						4
135	Merbah Belukar	Olive-winged bulbul	<i>Pycnonotus plumosus</i>						9						1
136	Merbah Corok-corok	Cream-vented bulbul	<i>Pycnonotus simplex</i>												2
137	Empuloh Janggut	Brown-cheeked bulbul	<i>Alophoixus bres</i>												1
138	Kareo Padi	White-breasted waterhen	<i>Amaurornis phoenicurus</i>												1
139	Kipasan Belang	Malaysian pied fantail	<i>Rhipidura javanica</i>					√		2					2
140	Trinil Pantai	Common sandpiper	<i>Actitis hypoleucos</i>												2
141	Munguk Beledu	Velvet-fronted nuthatch	<i>Sitta frontalis</i>									12			6
142	Dara-laut Batu	Bridled tern	<i>Onychoprion anaethetus</i>					√							1
143	Dara-laut Kecil	Little tern	<i>Sternula albifrons</i>					√							1
144	Dara-laut Tiram	Gull-billed tern	<i>Gelochelidon nilotica</i>					√							1
145	Celepuk Reban	Sunda scops owl	<i>Otus lempiji</i>												2
146	Beluk Ketupa	Buffy fish owl	<i>Ketupa ketupu</i>						√		√				1

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147	Kerak Kerbau	Javan myna	<i>Acridotheres javanicus</i>						6		12			6
148	Perling Kumbang	Asian glossy starling	<i>Aplonis panayensis</i>										12	2
149	Perling Kecil	Short-tailed starling	<i>Aplonis minor</i>						8				2	1
150	Jingjing Batu	Black-winged flycatcher-shrike	<i>Hemipus hirundinaceus</i>						9				2	12
151	Jingjing Petulak	Large woodshrike	<i>Tephrodornis gularis</i>											1
152	Tepus Pipi Perak	Crescent-chested babbler	<i>Stachyris melanothorax</i>											4
153	Ciung-air Jawa	Grey-cheeked tit-babbler	<i>Macronus flavicollis</i>										2	2
154	Luntur Harimau	Orange-breasted trogon	<i>Harpactes oreskios</i>								1		1	
155	Gemak Loreng	Barred buttonquail	<i>Turnix suscitator</i>										1	1
156	Gemak Tegal	Common buttonquail	<i>Turnix sylvaticus</i>											1

