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), Bandealit (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 specialization 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, HNV, MBNP

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 mosaic 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), Bandealit (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.

![Map of Meru Betiri National Park, study points, and observed resorts.](https://biotropika.ub.ac.id/)
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 Sanrejeno, 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-belied 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

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

| Habitat Type       | Rajekwesi | Sanrejeno | Andongrejo | Wonoasri | 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     |
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/Collocalia linchi     | 1.84  | 9.10   | 6.53 | 10.95| Ur    | Le      | A.B        |
| Coppersmith Barbet/Megalaima        | 1.84  | 6.60   | 3.54 | 8.45 | Ag    | Le      | A.B        |
| haemacephala                        |       |        |      |      |       |         |            |
| Grey-cheeked Green-pigeon /Treron   | 1.23  | 4.10   | -1.09| 5.33 | Fo    | Le      | A          |
| griseicuca                         |       |        |      |      |       |         |            |
| Yellow-vented Bulbul/Pycnonotus goiavier  | 1.53  | 3.68   | -0.75| 5.21 | Fo    | Le      | A          |
| Sooty-headed Bulbul/Pycnonotus auriaster  | 1.84  | 3.35   | -0.51| 5.19 | Ur    | Le      | A          |
| Javan Munia/Lonchura leucagostroides| 0.92  | 3.35   | -0.51| 4.27 | Ag    | Le      | A          |
| Blue-eared Barbet/Psilopogon australis | 1.23  | 3.02   | -0.51| 4.25 | Ag    | Le      | A          |

**Threatened and protected bird**

| Name/Species                        | Freq. | Abund. | Div. | IVI  | Spec. | IUCN    | Protection |
|-------------------------------------|-------|--------|------|------|-------|---------|------------|
| Crested Goshawk/Accipiter trivirgatus | 0.61  | 0.14   | 0.23 | 0.75 | He    | Le      | A.B        |
| Black Eagle/Ictinaetus malaiensis   | 0.31  | 0.04   | 0.10 | 0.35 | F     | Le      | A.B        |
| White-bellied Sea-eagle/Haliaeetus leucogaster        | 0.61  | 0.09   | 0.17 | 0.70 | He    | Le      | A.B        |
| Crested-serpent Eagle/Splornis cheela        | 1.53  | 0.66   | 0.50 | 2.19 | F     | Le      | A.B        |
| Javan Hawk-eagle/Nisaetus bartelsi       | 0.61  | 0.09   | 0.17 | 0.70 | F     | En      | A        |
| Rufous-bellied Eagle/Lopothiorechus kienii       | 0.92  | 0.14   | 0.23 | 1.06 | F     | Le      | A.B        |
| Honey-buzzard/Pernis pitiorhynchus       | 0.92  | 0.18   | 0.27 | 1.11 | F     | Le      | A.B        |
| Oriental-PIed Hornbill/Anthracoceros albirostris | 0.61  | 1.69   | 0.39 | 2.31 | Fo    | Le      | A.B        |
| Wreathed Hornbill/Rhyticerus undulatus     | 0.92  | 2.12   | 0.22 | 3.04 | Fo    | Le      | A.B        |
| Rhinoceros Hornbill/Buceros rhinoceros     | 0.92  | 0.37   | 0.40 | 1.30 | Fo    | Vu      | A.B        |
| Javan Coucal/Centropus nigrofus     | 0.61  | 0.09   | 0.17 | 0.70 | F     | Vu      | A          |
| Black-banded Barbet/Psilopogon javensis | 0.92  | 2.64   | -0.04| 3.56 | Fo    | Nt      | A          |
| Olive-backed Sunbird/Cimnyris jugularis | 1.53  | 1.74   | 0.37 | 3.28 | F     | Le      | A          |
| Dark-throated Oriole/Oriolus xanthonotus | 0.61  | 0.18   | 0.27 | 0.80 | Fo    | Nt      | A          |
| Green Peafowl/Pavo muticus           | 0.30  | 0.18   | 0.27 | 0.49 | He    | Vu      | A.B        |
| Javan Flameback/Chrysocolaptes strictus | 0.61  | 0.09   | 0.17 | 0.70 | Fo    | Vu      | A          |
| Yellow-throated Hanging-parrot/Loriculus pusillus | 0.92  | 1.03   | 0.52 | 1.96 | He    | Nt      | A.B        |
| Sunda-Fantail/Rhipidura javanica      | 0.92  | 0.28   | 0.35 | 1.20 | F     | Le      | 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 specializations. 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, agroforest 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 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 cyanovenetris 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 | Rajekwesi | Sanen | Andongrejo | Wonisari | Bandealt | Sukamade |
|----|-------------------|------------------------|--------------------------|------|-----|----------|-------|-----------|-------|------------|----------|----------|----------|
| 1  | Remetuk Laut      | Golden-bellied gerygone| Gerygone sulphurea       | ✓   | ✓   | ✓        |       |           |       |            |          |          |          |
| 2  | Elang Alap Jambul | Crested goshawk        | Accipiter trivirgatus    | ✓   | ✓   | ✓        |       |           |       |            |          |          |          |
| 3  | Elang Hitam       | Black eagle            | Ictinetaus malaisiens    | ✓   | ✓   | ✓        |       |           |       |            |          |          |          |
| 4  | Elang Laut Perut Putih | White-bellied sea eagle | Haliaeetus leucogaster  | ✓   | ✓   | ✓        |       |           |       |            |          |          |          |
| 5  | Elang Ular Bido   | Crested serpent eagle  | Spilornis cheela         | ✓   | ✓   | ✓        | 2     | 3         | 3     |            |          |          |          |
| 6  | Elang Jawa        | Javan hawk-eagle       | Nisaetus bartelsi        | ✓   | ✓   | ✓        |       |           |       |            |          |          |          |
| 7  | Elang Brontok     | Changeable hawk-eagle  | Nisaetus cirrhatus       | ✓   | ✓   | ✓        | 1     | 1         |       |            |          |          |          |
| 8  | Elang Bondol      | Brahminy kite          | Haliaetus indis          | ✓   | ✓   | ✓        | 1     |           |       |            |          |          |          |
| 9  | Elang-perut Karat | Rufous-bellied eagle   | Lophotriorchis kienleri  | ✓   | ✓   | ✓        | 1     | 1         |       |            |          |          |          |
| 10 | Sikep-mada Asia   | Crested honey buzzard  | Pernis ptilorhynchos     | ✓   | ✓   | ✓        |       | 1         |       | 2          |          |          |          |
| 11 | Cipoh Kacat       | Common iora            | Aegithina tibia          | ✓   | ✓   | ✓        | 16    | 12        | 5     |            |          |          |          |
| 12 | Cekakak Sungai    | Collared kingfisher    | Todiramphus chloris      | ✓   | ✓   | ✓        | 6     | 2         | 2     | 12         |          |          |          |
| 13 | Cekakak Jawa      | Javan kingfisher       | Halcyon cyanoventris     | ✓   | ✓   | ✓        | 2     | 5         |       | 1          |          |          |          |
| 14 | Cekakak Batu      | Banded kingfisher      | Lacedo meninting         | ✓   | ✓   | ✓        | 1     |           |       |            |          |          |          |
| 15 | Cekakak Suci      | Sacred kingfisher      | Todiramphus sanctus      | ✓   | ✓   | ✓        | 1     | 1         |       |            |          |          |          |
| 16 | Udang Api         | Rufous-backed Kingfisher | Ceyx rufidorsa      | ✓   | ✓   | ✓        | 2     | 1         |       |            |          |          |          |
| 17 | Raja-udang Meninting | Blue-eared kingfisher     | Alcedo meninting        | ✓   | ✓   | ✓        | 2     | 2         |       | 1          |          |          |          |
| 18 | Walet Leci        | Cave swiftlet          | Collocalia linchi       | ✓   | ✓   | ✓        | 42    | 34        | 45     | 15         | 23       |          |          |
| 19 | Kapinis Rumah     | House swift            | Apus nipalensis         | ✓   | ✓   | ✓        | 2     | 2         |       |            |          |          |          |
| 20 | Walet Sapi        | Glossy swiftlet        | Collocalia alcaucina    | ✓   | ✓   | ✓        | 1     |           |       |            |          |          |          |
| 21 | Kokokan Laut      | Striated heron         | Butorides striata       | ✓   | ✓   | ✓        | 5     | 2         |       |            |          |          |          |
| 22 | Cangak Merah      | Purple heron           | Ardea purpurea          | ✓   | ✓   | ✓        | 2     | 2         |       |            |          |          |          |
| 23 | Cangak Aba        | Grey heron             | Ardea cinerea           | ✓   | ✓   | ✓        | 1     |           |       |            |          |          |          |
| 24 | Blekok Sawah      | Javan pond heron       | Ardeaolus speciosa      | ✓   | ✓   | ✓        | 2     |           |       |            |          |          |          |
| 25 | Kuntul Karang     | Pacific reef heron     | Egretta sacra           | ✓   | ✓   | ✓        | 2     | 2         |       |            |          |          |          |
| 26 | Kuntul Kecil      | Little egret           | Egretta garzetta        | ✓   | ✓   | ✓        | 1     |           |       |            |          |          |          |
| 27 | Kuntul Kerbau     | Cattle egret           | Babulcus ibis           | ✓   | ✓   | ✓        | 5     |           |       |            |          |          |          |
| 28 | Kowak Malam Abu  | Black-crowned night heron | Nycticorax myctiocrax    | ✓   | ✓   | ✓        | 4     | 5         |       |            |          |          |          |
| 29 | Kepek Babi        | White-breasted woodswallow | Artamus leucorhynchos      | ✓   | ✓   | ✓        | 6     | 2         | 1     |            |          |          |          |
| 30 | Kangkaren Perut Putih | Oriental pied hornbill | Anthracoceros albirostris | ✓   | ✓   | ✓        | 19    | 17        |       |            |          |          |          |
| 31 | Julang Emas       | Wreathed hornbill      | Rhyticeros undulatus     | ✓   | ✓   | ✓        | 16    | 16        | 13    |            |          |          |          |
| 32 | Enggang Cula      | Rhinoceros hornbill    | Bacero rhinocerus        | ✓   | ✓   | ✓        | 2     | 2         |       |            |          |          |          |
| 33 | Sepah Kecil       | Small minivet          | Pericrocos cinnamomeus  | ✓   | ✓   | ✓        | 16    | 16        | 15    |            |          |          |          |
| 34 | Sepah Hutan       | Orange minivet         | Pericrocos flammeus      | ✓   | ✓   | ✓        | 12    | 15        | 12    |            |          |          |          |
| 35 | Sepah Gunung      | Sunda minivet          | Pericrocos miniatius     | ✓   | ✓   | ✓        | 2     |           |       |            |          |          |          |
| 36 | Kapsan Sayap Putih | White-shouldered triller | Lalage suerri          | ✓   | ✓   | ✓        | 23    | 5         |       |            |          |          |          |
| 37 | Kepudang-sungu Jawa | Javan cuckooshrike     | Coracina javensis       | ✓   | ✓   | ✓        | 2     | 2         |       |            |          |          |          |
| 38 | Kepudang-sungu Kecil | Lesser cuckooshrike       | Coracina finmbrata       | ✓   | ✓   | ✓        | 1     |           |       |            |          |          |          |
| 39 | Cabak Malang      | Large-tailed nightjar  | Caprimulgus macrurus    | ✓   | ✓   | ✓        | 1     |           |       |            |          |          |          |
| 40 | Cabak Kota        | Savanna nightjar       | Caprimulgus affinis     | ✓   | ✓   | ✓        | 4     |           |       |            |          |          |          |
| 41 | Cerek Jawa        | Javan plover           | Charadrius javanicus    | ✓   | ✓   | ✓        | 2     | 2         |       |            |          |          |          |
| 42 | Cica Daun Sayap Biru | Blue-winged leafbird     | Chloropsis cochinchenis | ✓   | ✓   | ✓        | 1     |           |       |            |          |          |          |
| 43 | Bungau Sendang Lawe | Woody-necked stork       | Ciconia episcopus       | ✓   | ✓   | ✓        | 3     | 2         | 1     | 4          | 2        |          |          |
| 44 | Bangau Tongtong   | Lesser adjutant        | Leptoptilos javanicus   | ✓   | ✓   | ✓        | 1     |           |       |            |          |          |          |
| 45 | Cici Padi         | Zitting cisticola      | Cisticola junicida      | 23   | 12        | 6     |           |       |            |          |          |          |
| 46 | Perenjak Jawa     | Bar-winged prinia      | Prinia familiaris       | 13   |           | 23    | 2         |           |          |          |          |          |
| No | Nama Indonesia       | English                              | Scientific Name         | IUCN | Javanese | Sanen | Andongrejo | Wonomasi | Bandeali | Sukamade | Resort Area  |
|----|---------------------|--------------------------------------|-------------------------|------|----------|-------|------------|----------|----------|----------|--------------|
| 47 | Cinenen Jawa        | Olive-backed tailorbird              | Orthotomus sepium      | NT   | 6        | 14    | 1          | 6        |          |          | Rajekwesi   |
| 48 | Cinenen Pising      | Common tailorbird                    | Orthotomus satius      | NT   | 6        |       | 2          |          |          |          |             |
| 49 | Cinenen Kelabu      | Ashy tailorbird                      | Orthotomus ruficeps    | NT   | 12       | 1     |            |          |          |          |             |
| 50 | Delimukan Zamrud    | Common emerald dove                  | Chalcoparia indica     | NT   | 1        |       |            |          |          |          |             |
| 51 | Dederuk Jawa        | Sunda collared dove                  | Streptopelia bitorquata| NT   | 1        |       |            |          |          |          |             |
| 52 | Tekukur Bisa       | Spotted dove                         | Spilopelia chinsensis  | NT   | 19       | 2     | 6          |          |          |          |             |
| 53 | Walik Kendang       | Black-naped fruit dove               | Ptilinopus melanopilis | NT   | 14       |       |            |          |          |          |             |
| 54 | Perkutin Jawa       | Zebra dove                           | Geopelia striata       | NT   | 1        |       |            |          |          |          |             |
| 55 | Punai Penganten     | Grey-cheeked green pigeon            | Treron griseicauda     | NT   | 21       | 25    | 16         | 25       |          |          | Rajekwesi   |
| 56 | Punai Siam          | Orange-breasted green pigeon         | Treron bicinctas       | NT   | 1        |       |            |          |          |          |             |
| 57 | Uncal Baau          | Ruddy cuckoo-dove                    | Macropygia emiliana    | NT   | 2        |       |            |          |          |          |             |
| 58 | Uncal Kouran        | Little cuckoo-dove                   | Macropygia ruficeps    | NT   | 1        |       |            |          |          |          |             |
| 59 | Pegan Hijau         | Green imperial pigeon                | Ducula aenea           | NT   | 3        |       |            |          |          |          |             |
| 60 | Tiong-lampa Bisa    | Oriental dollarbird                  | Euryzostoma orientalis | NT   | 2        | 2     |            |          |          |          |             |
| 61 | Gagak Hutan         | Slinger-billed crow                  | Corvus enca            | NT   | 6        |       | 18         | 13       |          |          |             |
| 62 | Tangkar Centrong    | Racket-tailed treepie                | Crypsirina temia       | NT   |          |       |            |          |          |          |             |
| 63 | Bubut Alang-alang   | Lesser coucal                        | Centropus bengalensis  | NT   | 2        | 6     | 5          |          |          |          |             |
| 64 | Bubut Jawa          | Sunda coucal                         | Centropus nigrogularis | NT   | √        |       |            |          |          |          |             |
| 65 | Bubut Besar         | Greater coucal                       | Centropus sinensis     | NT   | 1        |       |            |          |          |          |             |
| 66 | Wiwik Lurik         | Banded bay cuckoo                    | Cacomantis sommerati   | NT   | 4        | 1     | 2          |          |          |          |             |
| 67 | Wiwik Kelabu        | Plaintive cuckoo                     | Cacomantis meralinus   | NT   | 2        |       | 2          |          |          |          |             |
| 68 | Wiwik Uncuing       | Rusty-breasted cuckoo                | Cacomantis sepalrulis  | NT   | 1        |       |            |          |          |          |             |
| 69 | Kedasi Uncu  | Violet cuckoo                        | Chrysoococcyx sanothorhynchus | NT   | 1       |       |            |          |          |          |             |
| 70 | Kangkok Ranting     | Himalayan cuckoo                     | Cuculus saturatus      | NT   | 2        |       |            |          |          |          |             |
| 71 | Kedasi Hitam        | Square-tailed drongo-cuckoo          | Surniculus lagubiris   | NT   | 1        |       | 2          |          |          |          |             |
| 72 | Kadalan Birah       | Chestnut-breasted mallkoh            | Phaeicophaeus curvirostris | NT   |          |       |            |          |          |          |             |
| 73 | Kadalan Kemang      | Red-billed mallkoh                   | Phaeicophaeus javanicus | NT   | 1        | 1     |            |          |          |          |             |
| 74 | Cabai Jawa          | Scarlet-headed flowerpecker          | Dicaeum trochileum     | NT   | 5        | 2     |            |          |          |          |             |
| 75 | Cabai Rimba         | Yellow-vented flowerpecker           | Dicaeum cheysorbeum    | NT   | 2        |       |            |          |          |          |             |
| 76 | Cabai Bunga-api     | Orange-bellied flowerpecker          | Dicaeum trigonostigma  | NT   | 2        |       |            |          |          |          |             |
| 77 | Srigunting Batu     | Greater racket-tailed drongo         | Dicurus paradiseus     | NT   | 14       | 13    |            |          |          |          |             |
| 78 | Srigunting Hitam    | Black drongo                         | Dicurus macrocercus    | NT   | 1        |       |            |          |          |          |             |
| 79 | Bondol Jawa         | Javan munia                          | Lonchura leucogastroides | NT   | 34       | 21    | 16         |          |          |          |             |
| 80 | Bondol Pekang       | Scaly-breasted munia                 | Lonchura punctulata    | NT   | 19       | 12    |            |          |          |          |             |
| 81 | Bondol haji         | White-headed munia                   | Lonchura maja          | NT   | 12       | 1     |            |          |          |          |             |
| 82 | Sempur Hujan Rimba  | Banded broadbill                     | Eurylaimus javanicus   | NT   | 2        | 1     |            |          |          |          |             |
| 83 | Alap-alap Sapi      | Spotted kestrel                      | Falco molucensis       | NT   | 2        |       | 1          |          |          |          |             |
| 84 | Alap-alap Capung    | Black-thugged falconet               | Microhierax fringillarius | NT   | 2        |       |            |          |          |          |             |
| 85 | Alap-alap Kawah     | Peregrine Falcon                     | Falco peregrimus       | NT   | 1        |       |            |          |          |          |             |
| 86 | Tepekong Jambul     | Grey-rumped treeswift                | Hemiprocne longipennis | NT   | 19       | 3     | 6          | 2        |          |          |             |
| 87 | Layang-layang Batu  | Pacific swallow                      | Hirundo tahitica       | NT   | 6        |       | 34         |          |          |          |             |
| 88 | Layang-layang Loreng| Striated swallow                     | Cercopis striolata     | NT   | 7        | 1     |            |          |          |          |             |
| 89 | Layang-layang Api   | Barn Swallow                         | Hirundo rustica        | NT   | 14       | 4     | 12         | 9        |          |          |             |
| 90 | Bentet Kelabu       | Long-tailed shrike                   | Lanius schach          | NT   | 12       | 2     |            |          |          |          |             |
| 91 | Cica-koreng Jawa    | Striated grassbird                   | Megalurus palastris    | NT   | 17       |       |            |          |          |          |             |
| 92 | Takur Tulung Tumpak | Black-banded barbet                  | Megalaima javensis     | NT   | 23       | 19    | 14         |          |          |          | Rajekwesi   |
| 93 | Takur Buitok        | Lineated barbet                      | Megalaima lineata      | NT   | 1        |       |            |          |          |          |             |
| 94 | Takur Ungkut-ungkut | Coppersmith barbet                   | Megalaima haumecephala | NT   | 54       | 19    | 23         | 16       |          |          |             |
| 95 | Takur Tenggeret     | Blue-eared barbet                    | Psilopogon cyanotis    | NT   | 18       | 12    |            |          |          |          |             |
| 96 | Kirik-kirik Senja   | Chestnut-headed bee-eater            | Merops leschenauli     | NT   | 21       | 6     | 6          | 10       |          |          | Rajekwesi   |
| No. | Nama Indonesia         | English                  | Scientific Name               | IUCN   | Resort Area |
|-----|------------------------|--------------------------|-------------------------------|--------|-------------|
|     |                        |                          |                               | NT     | Law         | Appendix | CITES | Rajakwesi | Sanen | Andongrejo | Wonomari | Bandeali | Sukamade |
| 97  | Kehicap Ranting        | Black-naped monarch      | Hypothymis azurea            | Vu     | 2           |          |       |           |       |            |          |          |          |
| 98  | Kicuit Kerbau         | Western Yellow Wagtail   | Motacilla flava              | EN     | 2           |          |       |           |       |            |          |          |          |
| 99  | Sikatan Cacing        | Hill blue flycatcher     | Cynornis busmans             | EN     | 1           |          |       |           |       |            |          |          |          |
| 100 | Meniting Besar        | White-crowned forktail   | Enicurus leschenaulti        | Law    | 1           |          |       |           |       |            |          |          |          |
| 101 | Meninting Kece        | Sunda forktail           | Enicurus velatus             |       | 1           |          |       |           |       |            |          |          |          |
| 102 | Burung Madu Sriganti  | Olive-backed sunbird     | Cinnyris jugularis           |       | 5           | 6        | 12     | 12       | 2     |            |          |          |          |
| 103 | Burung Madu Kelapa    | Brown-throated sunbird   | Anthreptes malacensis        |       | 4           |          |       |           |       |            |          |          |          |
| 104 | Burungmadu Beluak     | Ruby-cheeked sunbird     | Chlupetoria singalenisis    |       | 1           |          |       |           |       |            |          |          |          |
| 105 | Burung-mado Sepah-Raja| Crimson sunbird          | Aethopyga siparaja           |       | √           |          |       |           |       |            |          |          |          |
| 106 | Burung-madu Jawa      | Javan sunbird            | Aethopyga mystacalis        |       | √           |          |       |           |       |            |          |          |          |
| 107 | Pijantung Kecil       | Little spiderhunter      | Arachnothera longirostris    |       | 1           |          |       |           |       |            |          |          |          |
| 108 | Pijantung Gunung      | Streaky-breasted spiderhunter | Arachnothera affinis     |       | 2           |          |       |           |       |            |          |          |          |
| 109 | Pijantung Besar       | Long-billed spiderhunter | Arachnothera robusta         |       | 2           |          |       |           |       |            |          |          |          |
| 110 | Kepudang Kuduk-hitam  | Black-naped oriole       | Oriolus chinensis            |       | √           |          |       |           |       |            |          |          |          |
| 111 | Kepudang Hutan        | Dark-throated oriole     | Oriolus xanthonotus          |       | 2           |          |       |           |       |            |          |          |          |
| 112 | Kacembang Gadung      | Asian fairy-bluebird     | Irena puella                 |       | 1           |          |       |           |       |            |          |          |          |
| 113 | Burung Gereja Erasia  | Eurasian tree sparrow    | Passer montanus              |       | 2           |          |       |           |       |            |          |          |          |
| 114 | Pelanduk Semak        | Hornbill's babbler       | Malacocincla sepia           |       | 5           |          |       |           |       |            |          |          |          |
| 115 | Pelanduk Topi Hitam   | Black-capped babbler     | Pelliornis capistratum       |       | 2           |          |       |           |       |            |          |          |          |
| 116 | Ayam Hutang Hijau     | Green junglefowl          | Gallus varius                |       | 12          |          |       |           |       |            |          |          |          |
| 117 | Ayam Hutang Merah     | Red junglefowl            | Gallus gallus                |       | 1           |          |       |           |       |            |          |          |          |
| 118 | Merak Hijau           | Green peacock            | Pavo muticus                 |       | √           | √        | √      | √        |       |            |          |          |          |
| 119 | Pelatuk Ayam          | White-bellied woodpecker  | Dryocopus javensis           |       | 2           |          |       |           |       |            |          |          |          |
| 120 | Pelatuk Sayap merah   | Crimson-winged woodpecker | Picus panicus                |       | 2           |          |       |           |       |            |          |          |          |
| 121 | Pelatuk Tunggir-emas  | Greater flameback        | Chrysocolaptes gutturalis    |       | √           |          |       |           |       |            |          |          |          |
| 122 | Pelatuk Besi          | Common flameback         | Dinoaipium javanense         |       | 1           |          |       |           |       |            |          |          |          |
| 123 | Pelatuk Kelabu Besar  | Great slaty woodpecker   | Mulleripicus pulvarulentus   |       | 1           |          |       |           |       |            |          |          |          |
| 124 | Caladi Tilik          | Sunda pygmy woodpecker   | Dendrocops moluccensis       |       | 2           |          |       |           |       |            |          |          |          |
| 125 | Caladi Ulam           | Fulvous-breasted woodpecker | Dendrocopos macropterus    |       | 2           | 21       | 5       | 3        |       |            |          |          |          |
| 126 | Caladi Tikotok       | grey-and-buff woodpecker | Hemicircus sordidus          |       | 1           |          |       |           |       |            |          |          |          |
| 127 | Paok Pancawarna      | Javan banded pitta       | Hydroornis guajana           |       | 3           | 5        | 3       |           |       |            |          |          |          |
| 128 | Manyar Jambul         | Streaked weaver           | Plocus manyr                 |       | 21          |          |       |           |       |            |          |          |          |
| 129 | Paruh-kodok Jawa      | Javan frogmouth          | Batrachosomus javensis       |       | 2           |          |       |           |       |            |          |          |          |
| 130 | Seruling Jawa         | Yellow-throated hanging parrot | Loriculus pusillus          |       | 6           |          |       |           |       |            |          |          |          |
| 131 | Merbah Cerukuk       | Yellow-vented bulbul      | Pycnonotus goiavier          |       | 14          | 16       | 42       | 3       | 13      |          |          |          |
| 132 | Cuca Kutilang        | Sooty-headed bulbul       | Pycnonotus aurigaster       |       | 14          | 14       | 12       | 14       | 1       | 16      |          |          |          |
| 133 | Cuca Kuricang        | Black-headed bulbul       | Pycnonotus atriceps         |       | 2           |          |       |           |       |            |          |          |          |
| 134 | Cuca Kuning          | Black-capped bulbul       | Pycnonotus melaniceutus      |       | 16          |          |       |           |       |            |          |          |          |
| 135 | Merbah Belukar       | Olive-winged bulbul       | Pycnonotus plumosus         |       | 9           | 1        | 13       |          |       |            |          |          |          |
| 136 | Merbah Corok-corok   | Cream-vented bulbul       | Pycnonotus simplex          |       | 2           |          |       |           |       |            |          |          |          |
| 137 | Empuluh Janggut      | Brown-cheeked bulbul      | Alophoixus brevipes         |       | 1           |          |       |           |       |            |          |          |          |
| 138 | Kareo Padi           | White-breasted waterhen   | Amianorhinus phoenicus       |       | 1           |          |       |           |       |            |          |          |          |
| 139 | Kipasan Belang       | Malaysian pied fantail    | Rhipidura javanica           |       | √           |          |       |           |       |            |          |          |          |
| 140 | Trinil Pantau        | Common sandpiper          | Actitis hypoleucos           |       | 2           |          |       |           |       |            |          |          |          |
| 141 | Munuk Beledu         | Velvet-fronted nuthatch   | Sitta frontalis             |       | 12          |          |       |           |       |            |          |          |          |
| 142 | Dara-laut Batu       | Bridled tern              | Onychoprion anaethetus      |       | √           |          |       |           |       |            |          |          |          |
| 143 | Dara-laut Kecil      | Little tern               | Sterna albifrons            |       | √           |          |       |           |       |            |          |          |          |
| 144 | Dara-laut Tiram      | Gull-billed tern          | Gelochelidon nilotica        |       | √           |          |       |           |       |            |          |          |          |
| 145 | Celepuk Reban        | Sunda scops owl           | Otus lempiji                |       | 2           |          |       |           |       |            |          |          |          |
| 146 | Beluk Ketupa         | Buffy fish owl            | Ketupa ketupu               |       | 1           |          |       |           |       |            |          |          |          |
| No | Nama Indonesia | English | Scientific Name | IUCN | Law | Appendix | CITES | Resort Area |
|----|----------------|---------|-----------------|------|-----|----------|-------|-------------|
| 147 | Kerak Kerbau | Javan myna | Acridotheres javanicus | 6 | 12 | 6 |
| 148 | Perling Kumbang | Asian glossy starling | Aplonis panayensis | 12 | 2 |
| 149 | Perling Kecil | Short-tailed starling | Aplonis minor | 2 | 1 |
| 150 | Jingjing Batu | Black-winged flycatcher-shrike | Hemipus hirundinaceus | 9 | 2 | 12 |
| 151 | Jingjing Petulak | Large woodshrike | Tephrodornis gularis | 1 |
| 152 | Tepus Ppi Perak | Crescent-chested babbler | Stachyris melanothorax | 4 | 4 |
| 153 | Ciung-air Jawa | Grey-cheeked tit-babbler | Macronus flavicollis | 2 | 2 |
| 154 | Luntur Harimau | Orange-breasted trogon | Harpactes oreskius | 1 |
| 155 | Gemak Loreng | Barred buttonquail | Turnix suscitator | 1 |
| 156 | Gemak Tegalan | Common buttonquail | Turnix sylvaticus | 1 |