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Bird Diversity in Several Habitat Types in Pondok Ambung Research Station, Tanjung Puting National Park, Central Kalimantan

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ABSTRAK

Diversitas Burung pada Beberapa Tipe Habitat di Stasiun Riset Pondok Ambung Tanjung Puting Kalimantan Tengah. Penelitian diversitas burung yang dilakukan di kawasan hutan gambut, dataran rendah, hutan kerangas dan hutan bekas kebakaran dilakukan setiap hari dua kali yaitu pukul 6:00 - 09:00 dan 15:00-18:00 pada kurun waktu 38 hari mulai 29 Juli hingga 5 September 2009. Metode pengamatan yang dilakukan adalah metode"point count" dan hasil yang diperoleh tercatat 107 jenis (38 famili) ada di kawasan stasiun ini, dan masing-masing ada 48, 50, 45 dan 50 jenis burung dapat dijumpai di hutan gambut, hutan sekunder dataran rendah swamp, hutan kerangas dan hutan bekas kebakaran.

Kata Kunci: Diversitas burung, habitat, Tanjung Puting,

INTRODUCTION

Tanjung Puting National Park (TPNP), in Central Kalimantan Province is one of Important Bird Areas (IBA) with ID number 49 (Holmes *et al.* 2001). The area holds high bird diversity. Nash and Nash (1986b) recorded 207 bird species existing in TPNP.

Many factors have influenced the high or low diversity of birds in certain area, such as, the availability of habitat types for birds, food availability, and predators (Blendinger and Ricardo 2001). TPNP has heath forest habitat types, lowland tropical rain forest dominated by Dipterocarpaceae and fields (Bohap & Galdikas 1986). In addition, TPNP has habitat types of freshwater swamp forest, peat swamp forests, mangrove forests, coastal forests (MacKinnon *et al.* 1998). Some of the area in TPNP experienced fire, including the area around Pondok Ambung Research Station. Post-fire forest in Pondok Ambung is heath forests which were burned in 2008.

The aim of this study were to 1) identify the species of birds in the Section of Conservation Area (SCA) I Pondok Ambung TPNP; 2) compare the diversity of birds in several types of habitats in the Section of Conservation Area (SCA) I Pondok Ambung TPNP, that's consists of forest swamps, lowland secondary forest, heath forest, post-fire forest; 3)

determine the vertical distribution of birds in several habitats in Section of Conservation Area (SCA) I Pondok Ambung TPNP that consists of swamp forest, lowland secondary forest, heath forest, and post-fire forest.

MATERIAL AND METHODS

Tanjung Puting National Park in West Kotawaringin Regency, Central Kalimantan Province (02 °35 '- 03° 35 ' south latitude, and 111" 50'-112 "15' west longitude). The observation was conducted at Pondok Ambung, Tanjung Puting National Park west Kotawaringin regency Central Kalimantan Province (Figure 1). Pondok Ambung is included in Conservation Area Section I of Pambuang Hulu. This research was conducted during 38 days starting from July 29th until September 5th2009.

Observations were carried out twice a day at 6:00 to 09:00 in the morning and 15:00 to 18:00 in the afternoon in four habitat types (swamp forest, lowland forest, secondary forest and post-fire heath forest).

MacKinnon Species List was used to assess the species richness. A total of 20 lists were made in each habitat type. In this study, only 10 species was listed in one list. Additionally point count method was used to assess the diversity of birds. Eight to ten points were plotted in each habitat type. Count was done for 15 minutes at each point. Vegetation surveys were done by using quadrate method (10x50)m^2 to describe vegetation profile. T-test was used to determine differences the bird species diversity among swamp forest habitat, lowland secondary forest, heath forest, and post-fire forest at 95% level of confidence.

RESULTS

Habitat

Swamp forest is tidal-influenced, relatively flat topography and with altitude 2 m asl and dense canopy closure. Some vegetation that were found in swamp forest is Ketiau (*Ganua montleana*),

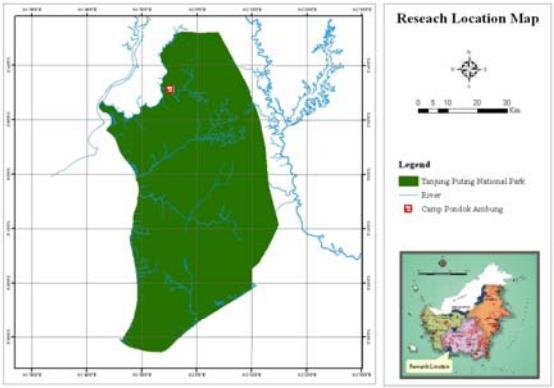

Figure 1. Map of Tanjung Puting National Park, showing the location of research in the Section of Conservation Area (SCA) I Pondok Ambung.

Rengas (*Gluta renghas*), Butun (*Barringtonia* sp.), Bekunyit (*Diospyros polyalthioides*), Meranti (*Shorea* sp.), Pudu (*Artocarpus kemando*), Puak (*Artocarpus* sp.) and Merang (*Gonystylus* sp.).

Secondary lowland forest is relatively flat and located at 3 m asl. Trees canopy is dense, while the cover ground vegetation are not too tight. Vegetation found in secondary lowland forest is Ubar (*Syzygium* sp.), Luari (*Schima wallichii*), Pempaning (*Quercus bennettii*), Idat (*Cratoxylon glaucum*), Meranti (*Shorea* sp.), Bintangur (*Callophyllum* sp.), and Ubar hubi (*Beachea* sp.). In secondary lowland forest habitat of the dominant vegetation is secondary Ubar (*Syzygium* sp.), Luari (*Schima wallichii*) and Idat (*Cratoxylum glaucum*).

Heath forest habitat is located at altitude of 6 m asl with a flat topography. Heath forest is near to secondary lowland forest. In this habitat the ground is sandy sour so it has poor nutrient and tree growth in this area is inhibited (Wirakusumah 1980). Vegetation found in the heath forests, consists of Luari (*Schima wallichii*), Jemai (*Rhodamnia cinerea*), Ubar (*Syzygium* sp.), Kremunting padang (*Melastoma* sp.).

Post-fire heath forest was burned in 2008. The topography is flat and located at altitude of 7 m asl. This area is being open area after burned and covered by coarse grass. The vegetation in this habitat includes Luari (*Schima wallichii*), Kremunting padang (*Melastoma* sp.), Kremunting frog (*Melastoma* sp.), Jemai (*Rhodamnia cinerea*).

Bird Diversity

A total of 107 species of birds comprising 38 families were recorded in the four habitat types. There were 48 species and 26 families in swamp forest, 50 species and 23 families in secondary lowland forest, 45 species and 24 families in heath forest, 50 species and 25 families in the post fire forest. Bellow is a graph of bird species richness in 4 types of habitats in TPNP that was obtained by using Type List MacKinnon (Figure 2). There are 22 species which are protected by Indonesian government Regulation No.7 of 1999 on Preservation of Biodiversity of Plants and Wildlife, while 4 species have status of IUCN (Endangered and Vulnerable) and the species are included in CITES (appendix I and II).

Diversity, Equality, and Evenness Index of Bird species

The result shows that the diversity indexes (H) in all type of habitat are not much different. Evenness index in all habitat types are spread almost evenly with value of nearly 1 (Table 1). The similarity index and dendrogram show the similarity among bird communities in research location. Location that has the highest similarity is secondary lowland forest and heath forest with index value 0,54 (Table 2).

Diversity and Dominance of Bird Species

Based on t-test, it can be seen that there is no significant differences in species diversity among 4 habitats (Table

3). Bird species in all habitat types have different levels in dominance (Table 4).

Vertical Distribution

Birds in swamp forests were spread vertically, on stratum A to E. Vertical distribution of birds in secondary lowland forest, were on stratum C to E. The vertically distribution of birds in heath forest has relation to vegetation stratum, they spread on stratum C to E. The species of birds in the post fire forest to just spread on the stratum D (Table 5).

DISCUSSION

Utilization of Vegetation Stratum

The species of birds that were found during observation have used existing vegetation stratum in TPNP to do their activities. Swamp forest habitats used by 48 bird species for their activities. Secondary lowland forest habitat was used by 50 bird species for their activities. Heath forest habitats were used by 45 species of birds to for several activities. Post-fire forest habitats were used by 50

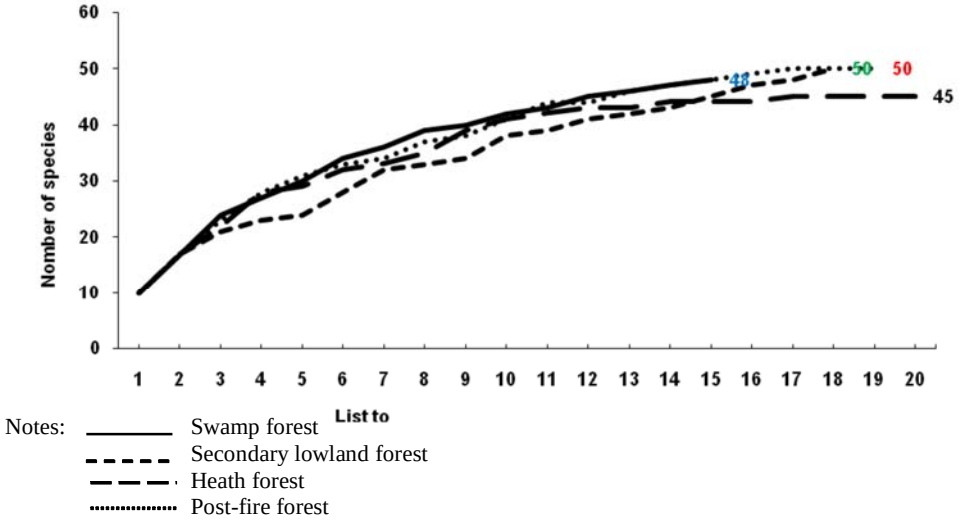

Figure 2. Bird species discovery curve with List Type MacKinnon in four habitat types.

Table 1. Evenness indices (E) in four types of habitat in Tanjung Puting National Park.

Habitat type	Number Type	H'	E'
Swamp Forest	48	2.87	0.87
Secondary Lowland Forest	50	2.86	0.85
Heath forest	45	2.64	0.76
Post-Fire Forest	50	2.79	0.78

Table 2. Similarity indices of bird species in four types of habitat in Tanjung Puting National Park

Location	Swamp Forest	Secondary Lowland Forest	Heath forest	Post-Fire Forest
Swamp Forest	1	0.43	0.36	0.29
Secondary Lowland Forest		1	0.54	0.39
Heath forest			1	0.53
Post-Fire Forest				1

Table 3. T value in the four habitats

Habitat	Swamp Forest	Secondary Lowland Forest	Heath forest	Post-Fire Forest
Swamp Forest	1	0.07 ^{ns}	1.47 ^{ns}	0.63 ^{ns}
Secondary Lowland Forest		1	2.02 ^{ns}	1.39 ^{ns}
Heath forest			1	1.31 ^{ns}
Post-Fire Forest				1

Table 4. Dominance of bird species in four habitat types.

Habitat Type	Dominant	Subdominan	Not Dominant	Amount
Swamp Forest	5	7	36	48
Secondary Lowland Forest	5	9	36	50
Heath forest	5	5	35	45
Post-Fire Forest	5	8	37	50

species of birds for their activities on stratum of D and above D.

Bird's activities that were mostly observed in all forest habitat consisted of singing, perching, flying, and walking. In secondary lowland forest habitat birds activities consisted perching, singing, flying and walking. In heath forest bird's activities that could be observed were flying, singing, perching and walking. In post-fire forest habitats the bird's activities were perching, flying and singing.

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Table 5. Vertically spread of birds in four habitat types in TPNP.

Criteria*	Swamp Forest	Secondary Lowland Forest	Heath forest	Post-Fire Forest
Stratum A	7	-	-	-
Stratum B	3	-	-	-
> Stratum C	-	6	18	-
Stratum C	24	26	13	-
> Stratum D	-	-	-	24
Stratum D	13	16	11	26
Stratum E	1	2	3	-

*stratum A (0-1m), stratum B (1-4,6m), stratum C (4,6-20m), stratum D (20-30m), stratum E (>30m).

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