

Diversity of Birds in Tepus Village of Gunungkidul District of Yogyakarta

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ABSTRACT

Tepus village of Gunungkidul District is one of the coastal regions of karst in the Daerah Istimewa Yogyakarta. Coastal karst area generally has its own species of avifauna that typical considering several factors supporting the life of birds as well as the existence of the reef, the typical vegetation of karst and others. This research aims to discover the diversity species of birds in the Tepus village of Gunungkidul District. The study was conducted during two months in May - June 2011. We retrieval the data with *Explore Method* and analyze it with an *Encounter Rates Method*. Observers are divided into 3 groups with different observation spot but are in one location. The types of birds are observed will be identified, count the number of individual preference, and recorded in a table of observations.

The results showed there are 42 species of birds included into 22 families. Types with the highest abundance are in Cave Swiftlet (*Collocalia linchi*) with a value of 193.548387. Species of birds endemic to the island of Java that was found was the Sunda Coucal (*Centropus nigrorufus*), Flame-Fronted Barbet (*Megalaima armillaris*), Plain Prinia (*Prinia inornata*), and the Brown Prinia (*Prinia polychroa*). The Sunda Coucal is recorded VU (Vulnerable)/ threatened in Red list of IUCN. Based on the Status of the rules of international trade in CITES, Peregrine Falcon (*Falco peregrinus*) which was recorded in the area are listed in Appendix I. Beside of that there are eight species of birds are listed as protected species Act No. 5/1999 and PP No. 7/1999.

Key words: *Diversity, Birds, Karst, Tepus, Gunungkidul.*

INTRODUCTION

Indonesia is known as a country that has the highest biodiversity of Southeast Asia, at the level of world Indonesia was ranked second after Brazil, there are even says "world's mega biodiversity nation" which is included in the group "biodiversity hotspots" nations ". This is not the geographical layout of Indonesia. Geographically Indonesia has thousands of islands that lies between the two continents of Asia and Australia, and crossed the equator.

With this position, Indonesia is one of the countries which have great biodiversity in the world. With a total area of 1.3% of the Earth, as a country, Indonesia has mega biodiversity wildlife is very high which consists of mammals 515 species (12% of the mammals of the world), the reptiles 511 species (7.3% of the species of reptiles in the world), amphibians 270 species of animals are vertebrates 2800 species, 35 species of primates, 1400 species of freshwater fish and 121 species of butterflies (Status Lingkungan Hidup, 2008). In addition, Indonesia is one of the important areas for biodiversity bird; Indonesia had a 1598 bird species (17% of the world). From 1598 was scattered across Indonesia, the island of Sumatra has 628 species, the Java-Bali 507 species, Lombok and surrounding 426 species, Papua 671 species, Borneo and Sulawesi species 522.416 species (Brando, 2011).

Birds are an important component in the food chain cycles in a region. Birds play a role in assisting the process of dispersal of seeds, assisting the process of pollination to the flowers,

and as indicators of environmental pollution. Because of that, bird conservation is needed. For that purpose, collecting the data about the diversity and abundance of bird in certain area was very important to do, particularly in the Tepus Village of Gunungkidul District that consist of three beaches, Sundak Beach, Indrayanti Beach and Watulawang Beach. Along that beaches are a constituent composition of natural attractions with karst rocks and white sand beaches. With the composition of karst rocks and white sand in the region must determine the diversity of birds. For that, there is need for data collection diversity and abundance of birds in Tepus Village.

METHODS

The method that we used to retrieval the data is *Explore Method*. The area divided in to three of trek observation. Then the observers divided too for take the data of each trek in the same time. The method for analyze the data research is *Encountered rates*. Encounter rate data can be split into crude ordinal categories of abundance (e.g. abundant, common, frequent, uncommon and rare) (Bibby et.al, 2000), making these terms much more useful as they have some definition and allowing a species list to be annotated in such a way that future surveys might detect large scale changes in the abundance of individual species. The analysis of encounter rate data is very straightforward. There are three observers to collecting the data. Each observer has a different observation trek. The encounter rate for each species is equal to the total number of individuals recorded by all three observers divided by the period of observation and multiplied by ten to give a result in units of number of individuals recorded per ten hours of survey.

STUDY AREA



Picture 1. Map of the Area of Research (Anonim, 2011)

Tepus Village of Gunungkidul District consists of three beaches, Sundak Beach at 08,146150 Indrayanti Beach at 08, 149683 and Watulawang Beach at 08,149683. Those beaches are centre of tourism where the birds live also. According to the physics view (Picture 1), observation area divided in to two kinds of area, The Coastal Shrub and Karst Forest. Type of The Coastal Shrub dominated with underbrush and shrubs on row of reefs that have low density of vegetation. The substrate is white-sand so that can not save water well. The vegetation consists of genus *Casuarina* that known as introduction plants, *Pandanus* spp, *Acacia*, and row of Coconut trees (*Cocos nucifera*).

The Karst Forest is range of hills. This area consists of caves and river that flows under the land surface. Water distribution move faster based on the type of vegetation that dominating. Commonly, the composition of plants is dominated by *Tectona grandis*, *Acacia nilotica*, and *Acacia longifolia*.

RESULTS

During the data retrieval, there are 42 species of birds around the location of observation that is included in to 22 families (table 1). Types of waterfowl found amounted to 5 species in the Family Ardeidae, Sternidae, Stercorariidae, and Phaetonidae. Rusila-Noor et.al. (1999) wrote that the water can be defined as a type of birds ecologically dependent on wetlands. Wetlands are referred to in this research area is the coral and white sand beaches along the Sundak Beach - Indrayanti Beach - Watulawang Beach which are characteristic of karst area. The land is used by waterfowl as a nesting and foraging. The other is the seventeenth tribal land birds that many tribes inhabiting the forests of lime and Sandy bush land.

Table 1. Bird abundance in Tepus, Wonosari, Gunung Kidul DI Yogyakarta

Family	Species Scientific Name	Number of individuals by each observer (3 observers)			Number of individuals	Number of individuals/10 hours	Class or relative abundance
		1	2	3			
Ardeidae	1. <i>Egretta sacra</i>	1	1	1	3	1.935483871	uncommon
Sternidae	2. <i>Gygis alba</i>	6	9	6	21	13.5483871	common
	3. <i>Sterna sumatrana</i>	1	2	10	13	8.387096774	frequent
Apodidae	4. <i>Collocalia linchi</i>	100	100	100	300	193.5483871	abundant
	5. <i>Apus affinis</i>	7			7	4.516129032	frequent
	6. <i>Collocalia maxima</i>	2			2	1.290322581	uncommon
Nectarinidae	7. <i>Nectarinia jugularis</i>	7	2	3	12	7.741935484	frequent
	8. <i>Anthreptes malacensis</i>	1	1		2	1.290322581	uncommon
Columbidae	9. <i>Streptopelia chinensis</i>	3	1	1	5	3.225806452	frequent
	10. <i>Macropygia ruficeps</i>	2			2	1.290322581	uncommon
	11. <i>Geopelia striata</i>			3	3	1.935483871	uncommon
	12. <i>Macropygia emiliana</i>		1		1	0.64516129	uncommon
	13. <i>Treron sp.</i>		1		1	0.64516129	uncommon
	14. <i>Streptopelia bitorquata</i>		1		1	0.64516129	uncommon
Alcedinidae	15. <i>Halcyon chloris</i>	13	7	4	24	15.48387097	common
Lanidae	16. <i>Lanius schach</i>	8	6	3	17	10.96774194	common
	17. <i>Lanius cristatus</i>	1	2		3	1.935483871	uncommon
Ploceidae	18. <i>Passer montanus</i>	23		1	24	15.48387097	common
Estrildidae	19. <i>Lonchura leucogastroides</i>	60	45	23	128	82.58064516	abundant
	20. <i>Lonchura punctulata</i>		2		2	1.290322581	uncommon
Pycnonotidae	21. <i>Pycnonotus aurigaster</i>	14	43	33	90	58.06451613	abundant
	22. <i>Pycnonotus goiavier</i>	15	2		17	10.96774194	common
Falconidae	23. <i>Falco peregrinus</i>	2	1		3	1.935483871	uncommon

Silviidae	24. <i>Orthotomus palpebrosus</i>	4	2	6	3.870967742	frequent
	25. <i>Prinia polychroa</i>	2	1	3	1.935483871	uncommon
	26. <i>Prinia inornata</i>		5	5	3.225806452	frequent
	27. <i>Orthotomus ruficeps</i>		1	1	0.64516129	uncommon
	28. <i>Prinia sp.</i>		2	2	1.290322581	uncommon
	29. <i>Cisticola juncidis</i>	6	1	7	4.516129032	frequent
Acanthizidae	30. <i>Gerygone sulphurea</i>		2	2	1.290322581	uncommon
Cuculidae	31. <i>Centropus nigrorufus</i>	2		2	1.290322581	uncommon
	32. <i>Centropus sinensis</i>		1	1	0.64516129	uncommon
	33. <i>Cocomantis sepulcralis</i>	1	1	3	1.935483871	uncommon
	34. <i>Cocomantis merulinus</i>	1	1	2	1.290322581	uncommon
Alaudidae	35. <i>Mirafra javanica</i>		1	1	0.64516129	uncommon
Stercorariidae	36. <i>Stercorarius parasiticus</i>		1	1	0.64516129	uncommon
Phaetontidae	37. <i>Phaethon lepturus</i>		1	1	0.64516129	uncommon
Dicaeidae	38. <i>Dicaeum trochileum</i>		2	2	1.290322581	uncommon
Capitonidae	39. <i>Megalaima armillaris</i>	1		1	0.64516129	uncommon
Aegithinidae	40. <i>Aegithina tiphia</i>	1	4	5	3.225806452	frequent
Hirundinidae	41. <i>Dalycon dasipus</i>	5	1	6	3.870967742	frequent
Artamidae	42. <i>Artamus leucorhyncus</i>	5	2	7	4.516129032	frequent

Description: Relative abundance in the table above refers to the standards established by Lowen et al (1996) as follows:

Table 2. Standard Value Abundance

Abundance category (Number of individuals per 100 field hours)	Abundance score	Ordinal scale
< 0,1	1	rare
0,1 - 2,0	2	uncommon
2,1 - 10,0	3	frequent
10,1 - 40,0	4	common
40,0 +	5	abundant

The highest abundance values are the type with a value of 193.5483871 Cave Swiftlet (*Collocalia linchi*). The lowest abundance is 0.64516129 which are occupied by several species of birds that is Island Collared Dove, Horsfield's Bush Lark, Ruddy Cuckoo Dove, Pigeon (not identified), Ashy Tailorbird, Parasitic Jaeger, White-tailed Tropicbird, Sunda Coucal, and Flame-fronted Barbet. In this study also successfully found four bird species have limited distribution (endemic), is the only bird species found in Java. The four species of birds are Sunda Coucal (*Centropus nigrorufus*), Flame-fronted Barbet (*Megalaima armillaris*), Plain Prinia (*Prinia inornata*), and Brown Prinia (*Prinia polychroa*). Nine species of birds in this study also entered into the record some of them Wildlife protection status according to IUCN (*International Union Conservation of Nature and Natural Resources*), the international status according to CITES (*Convention on International Trade of Endangered*

Species of Wild Fauna and Flora) trade regulations, and protection status of the Law of the State of Republic Indonesia (Table 3).

DISCUSSION

The high value of abundance of a species of bird can be interpreted that these birds can adapt to environmental conditions, both physical conditions such as weather and landscape as well as other supporting conditions such as availability of food, type of vegetation and other animal species that live in the same environment. Several groups of birds can live sustainably until today due to have succeeded in creating a special niche for itself to reduce competition for resources and needs as a form of adaptation to environmental conditions.

The high value of abundance of a species of bird can be interpreted that these birds can adapt to environmental conditions, both physical conditions such as weather and landscape as well as other supporting conditions such as availability of food, type of vegetation and other animal species that live in the same environment. Several groups of birds can live sustainably until today due to have succeeded in creating a special niche for itself to reduce competition for resources and needs as a form of adaptation to environmental conditions. The southern coastal region dominated Limestone Mountains has fewer sources of food and thus affects the rate of population of a species, especially birds. Some species become difficult to find because it is very sensitive to changing environmental conditions and human existence, allowing species is very difficult to find or even not found.

Several bird species that enter the lowest abundance value caused less able to utilize the resources that exist around the environment. Bird family Columbidae (*Streptopelia bitorquata*, *Macropygia Emiliana* and *Treron* sp.) is the fruit and seed-eating birds. While the intensive search areas are dry areas with open composition of vegetation *Tectona grandis*, *Acacia nilotica*, and *Acacia longifolia*. Ashy Tailorbird (*Orthotomus ruficeps*) an insectivorous bird, the bird is rarely found in the area of research. This is because in addition to the size of 11 cm is also sensitive to the presence of observers. Parasitic Jaeger (*Stercorarius parasiticus*) is a habitat for water birds; these birds are rarely found because the activity of these birds flew low over the sea. This species is found on the offensive Black-naped Tern (*Sterna sumatrana*) on cliffs (Mackinnon, 2010). White-tailed Tropicbird (*Phaeton lepturus*) is a habitat for water birds, these birds are rarely found because in addition to his activities were flying over the ocean surface to look for pelagic fish meal (fish floating), assumed to be a little individual. Sunda Coucal (*Centropus nigrorufus*) is a bird-eating caterpillar (Mackinnon, 2010), this bird is rarely found because in addition to the limited spreading of endemic Java, has a tolerance level which a narrow habitat. This bird has the only coastal habitats and wetlands. Flame-fronted Barbet (*Megalaima armillaris*) is eating fruits, Ficus (Banyan tree) and insects. This bird is rarely found because of the color that resembles a leaf and is a quiet bird.

Table 3. Species Protection Status

Species		Distribution	Status
Common Name	Scientific Name		
Pacific Reef Egret	<i>Egretta sacra</i>	SKJCMTP	AB ³
Angel Tern	<i>Gygis alba</i>	SKJMTP	AB ³
Black-naped Tern	<i>Sterna sumatrana</i>	SKJCMTP	AB ³
Cave Swiftlet	<i>Collocalia linchi</i>	SJT	*

House Swift	<i>Apus affinis</i>	SKJCT	*
Black-nest Swiftlet	<i>Collocalia maxima</i>	SKJ	*
Olive-backed Sunbird	<i>Nectarinia jugularis</i>	SKJCMTP	AB ³
Brown-throated Sunbird	<i>Anthreptes malacensis</i>	SKJCMT	AB ³
Spotted Dove	<i>Streptopelia chinensis</i>	SKJFFT	*
Little Cuckoo Dove	<i>Macropygia ruficeps</i>	SKJT	*
Zebra Dove	<i>Geopelia striata</i>	SFJFFT	*
Ruddy Cuckoo Dove	<i>Macropygia emiliana</i>	SKJT	*
Pigeon	<i>Treron sp.</i>		*
Island Collared Dove	<i>Streptopelia bitorquata</i>	FKJCMT	*
Collared Kingfisher	<i>Halcyon chloris</i>	SKJCMTP	AB ³
Long-tailed Shrike	<i>Lanius schach</i>	SKJCMT	*
Brown Shrike	<i>Lanius cristatus</i>	SKJCMTP	*
Javan Munia	<i>Lonchura leucogastroides</i>	SJTE	*
Eurasian Tree Sparrow	<i>Passer montanus</i>	SJ	*
Scaly-breasted Munia	<i>Lonchura punctulata</i>	SKJCT	*
Sooty-headed Bulbul	<i>Pycnonotus aurigaster</i>	FFJF	*
Yellow-vented Bulbul	<i>Pycnonotus goiavier</i>	SKJFMT	*
Peregrine Falcon	<i>Falco peregrinus</i>	SKJCMTP	I ² – AB ³
Common Tailorbird	<i>Orthotomus palpebrosus</i>	FFJFMTF	*
Golden-bellied Gerygone	<i>Gerygone sulphurea</i>	SKJCMT	*
Brown Prinia	<i>Prinia polychroa</i>	J	*
Plain Prinia	<i>Prinia inornata</i>	J	*
Ashy Tailorbird	<i>Orthotomus ruficeps</i>	SKJ	*
Prinia	<i>Prinia sp.</i>		*
Zitting Cisticola	<i>Cisticola juncidis</i>	SKJCMTP	*
Sunda Coucal	<i>Centropus nigrorufus</i>	J	VU ¹ – AB ³
Greater Coucal	<i>Centropus sinensis</i>	SKJ	*
Rusty-breasted Cuckoo	<i>Coccomantis sepulcralis</i>	SKJCMT	*
Plaintive Cuckoo	<i>Coccomantis merulinus</i>	SKJC	*
Horsfield's Bush Lark	<i>Mirafra javanica</i>	KJTP	*
Parasitic Jaeger	<i>Stercorarius parasiticus</i>	JCT	*
White-tailed Tropicbird	<i>Phaethon lepturus</i>	SKJCMTP	*
Scarlet-headed Flowerpecker	<i>Dicaeum trochileum</i>	SKJT	*
Flame-fronted Barbet	<i>Megalaima armillaris</i>	J	AB ³
Common Iora	<i>Aegithina tiphia</i>	SKJ	*
Asian House Martin	<i>Dalycon dasipus</i>	SKJ	*
White-breasted Woodswallow	<i>Artamus leucorhynchus</i>	SKJCMTP	*

Description: ¹Status IUCN protection; ²Status CITES protection; ³Status Republic Indonesia Protection based on Act No. 5/199 and PP No. 7/1999; * Status Unknown

Based on the results of observation, there are 42 species of 22 families with different of habitat conditions and habits. Of the 42 species found 1 of them according to the IUCN is Sunda Coucal (*Centropus nigrorufus*). One of them according to CITES included in Appendix I is Peregrine Falcon (*Falco peregrinus*). All types in Appendix I are endangered species and will be impact if traded. Trading is only permitted only in certain conditions such as for scientific research). While five of them including protected species Law no. 5 / 1990 (*On the Conservation of Natural Resources and Ecosystems*) and PP. 7 / 1999 (*Concerning the Preservation of Type Plants and Animals*) are Pacific Reef Egret (*Egreta sacra*), Black-naped Tern (*Sterna sumatrana*), Olive-backed Sunbird (*Nectarinia jugularis*), Collared Kingfisher (*Halcyon chloris*), Peregrine Falcon (*Falco peregrinus*), Angel Tern (*Gygis alba*), and Flame-fronted Barbet (*Megailama armillaris*). Because a lot of bird that protected with Law, There is a need to continue the monitoring and conduct a more intensive survey at Tepus Village for the conservation of bird there.

CONCLUSION

There are 42 species of bird that conclude in 22 families in Tepus Village of Gunungkidul District Yogyakarta. High or low abundance value of a bird species can be interpreted that these birds can adapt to environmental conditions. The environmental condition of Tepus Village is karst that supports some specific bird to life with all of the excesses and lacks.

Tepus Village of Gunungkidul District Yogyakarta is importans site of bird.

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