



ABUNDANCE AND SIGHTING FREQUENCY OF BIRDS IN SENDI – GAJAH MUNGKUR TRACK, TAMAN HUTAN RAYA RADEN SOERJO, MOJOKERTO REGENCY

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ABSTRACT

Sendi – Gajah Mungkur is one of conservation area in Taman Hutan Raya Raden Soerjo, Mojokerto Regency. This is region mostly composed by tropical rainforest with altitude of 1067 – 1174 amsl with rich biodiversity including orchids, mammals, and birds. Some evidence concerning Taman Hutan Raya Raden Soerjo's richness are some reports and documentations about the *Zoothera andromedae*, *Ficedula narcis*, and *Arborophila javanica* as new records in West Java. This research is done to determine the abundance and sighting frequency of birds in Sendi – Gajah Mungkur track, Taman Hutan Raya Raden Soerjo, Mojokerto Regency using modified line transect method. Species with the most abundance and sighting frequency are *Collocalia linchi*, *Zosterops palpebrosus*, and *Dicaeum sanguinolentum*.

Key words: Abundance, Sighting Frequency, Sendi, Gajah Mungkur, Taman Hutan Raya Raden Soerjo

INTRODUCTION

Indonesia has once been dubbed as the Emerald of the Equator due to its large forest area throughout the country. The forest is not only widely regarded as the world's lungs, but also the country's most precious heritage. It conserves biodiversity of many kinds of flora and fauna, which help make Indonesia becomes one of the countries with mega biodiversity in the world. One of the Indonesia's forests that is rich in biodiversity is *Tahura R. Soerojo*, located at the eastern part of Java. (*Tahura* stands for "*Taman Hutan Raya*," which can be roughly translated as "Grand Forest Park.")

Tahura R. Soerjo is one of the water catchment areas in East Java. Located at the foot of Mount Welirang and Arjuna, this area stands about 1067 – 1174 meters above the sea level. It has a total land mass of 27,868.30 Ha and is considered as the third biggest *Tahura* in Indonesia (Foto Biodiversitas, 2012). Aside from its considerably wide area, this forest's condition is that of a tropical rain forest that has several springs which allow the biodiversity to remain high. *Tahura R. Soerjo* has as many as 163 springs that spread across 13 sub-districts (Foto Biodiversitas, 2012). The springs come from the Brantas River, the second longest river of Java. One instance of the biodiversity that belongs to this forest is the bird species, namely by the new discovery of several species in East Java, such as *Zoothera andromedae*, *Ficedula narcis*, and *Arborophila javanica*. The area includes some regions of Cangar, Sendi, Gajah Mungkur, Tretes, and Sendi. Gajah Mungkur itself is one of the area's regions that also contain many species of birds. Unfortunately, the information regarding the species is remotely small.

Birds are one of the unique forms of wildlife. Aside from their fur color, voices and living habits, they also have a significant role as indicator of environmental health. In some circumstances, birds can be used as excellent barometers of wider environmental health, particularly when such assessments use summarized data from a wide range species (Bibby, 1999 *In: Gregory et al.*, 2004). Rudyanto (2007) also stated that birds can be used as environmental health indicator that possesses high level of biological diversity, since birds can virtually be found in any kinds of habitat, relatively easy to identify and are sensitive to environmental changes.

Birds are prone to be used as targets for poaching. Up until now, there are many endemic and law-protected birds that have fallen victims at the hands of irresponsible poachers. Aside from the illegal hunting, the destruction of the birds' habitat (deforestation, for instance) can also cause the numbers of certain kinds of birds to decrease. These problems apparently happen at several regions of the *Tahura*. If the problems persist, several species of bird will slowly become endangered or even extinct. Therefore, some acts of conservation need to be executed in order to prevent the worst from ever happening.

Surveying the birds' whereabouts is one of the efforts that can be exercised in order to find out and maintain the number of certain species at certain areas. The data obtained from the survey can be used as references for future use. Not only that, the study of the birds' species is also need to be done more intensively so that the sustainability can be kept safely.

MATERIALS AND METHODS

Collection and Identification Birds

The data retrieval is done along the line track of Sendi – Gajah Mungkur, Taman Hutan Raya (Grand Forest Park) Raden Soerjo, Mojokerto Regency at May 17th – 20th 2013 (Figure 1). The sample extracting is done four times by using modified line transect method. The observation begins at 6 AM and ends at 9 AM. The retrieved data are the birds' species and the amount for each species. The line track is throughout 2 km, divided into four observation points with the interval of 500 m for each point. The observation is done at each point for 30 minutes long, with the distance field of view is 20m for each direction (left and right). The observation uses binocular and GPS. As for the measuring of abiotic component, the tools that are used consist of anemometer, luxmeter, and thermo-hygrometer. The identification of the birds' species is based on Mac Kinnon (1998)

Data analysis

The collected data are used to find out the abundance and the frequency. The index of abundance is obtained by using adopted calculation method from Krebs (1989):

$$\text{Abundance} = \frac{\text{number of individuals for a species } (ni)}{\text{total number of individuals found } (N)} \times 100\%$$

As for calculating the frequency of occurrence, the method is using equation adopted from Misra (1968):

$$\text{Frequency} = \frac{\text{number of stations where a species can be observed}}{\text{total number of stations}} \times 100\%$$



Figure 1. Research Location

RESULT AND DISCUSSION

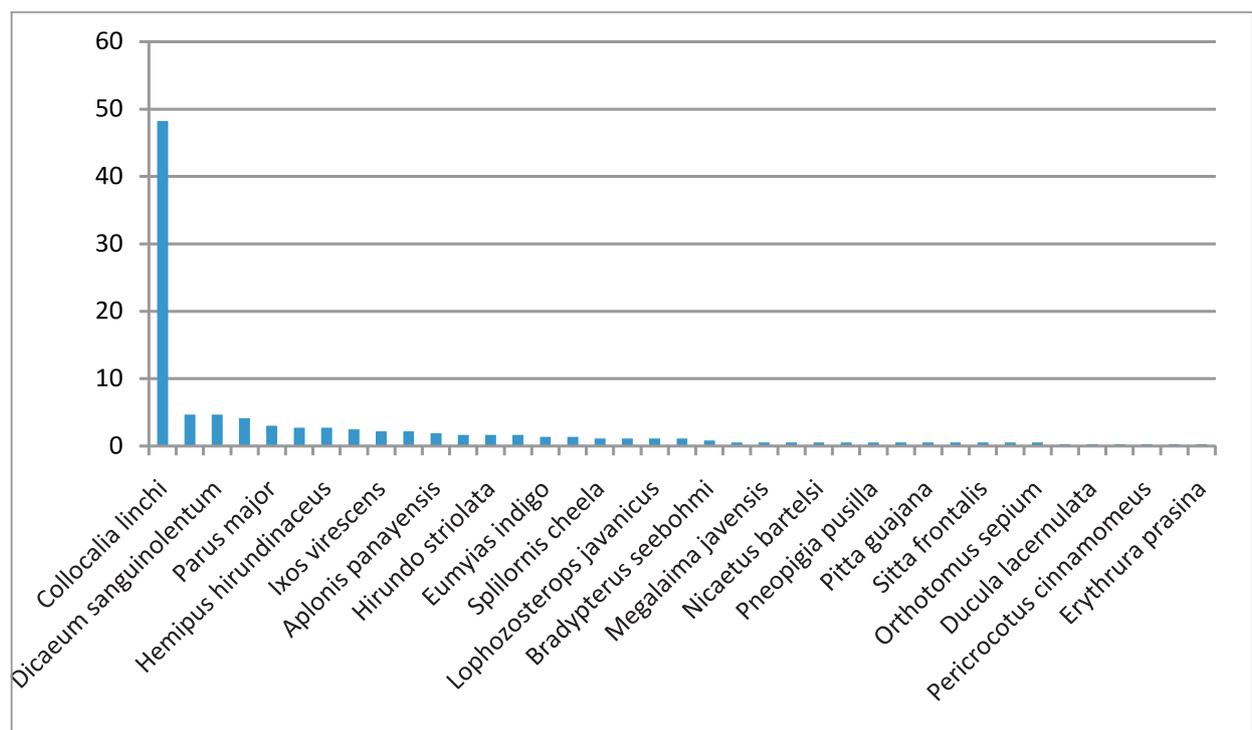
From the four observation spots, some species such as *Collocalia linchi*, *Zosterops palpebrosus*, *Dicaeum sanguinolentum*, *Rhyticeros undulatus*, *Parus major*, *Megalaima armillaris*, *Hemipus hirundinaceus*, *Pericrocotus miniatus*, *Ixos virescens*, *Megalaima australis*, *Aplonis panayensis*, *Macropygia unchall*, *Hirundo striolata*, *Pycnonotus goiavier*, *Eumyias indigo*, *Pycnonotus aurigaster*, *Splilornis cheela*, *Sitta azurea*, *Lophozosterops javanicus*, *Macropygia ruficeps*, *Bradypterus seebohmi*, *Eurylaimus javanicus*, *Megalaima javensis*, *Ictinaetus malayensis*, *Nicaetus bartelsi*, *Ficedula hyperythra*, *Pneopigia pusilla*, *Culicicapa ceylonensis*, *Pitta guajana*, *Melacocincla sepiarum*, *Sitta frontalis*, *Macropygia emiliana*, *Orthotomus sepium*, *Chalcophaps indica*, *Ducula lacernulata*, *Treron griseicauda*, *Pericrocotus cinnamomeus*, *Aethopyga mystacalis*, *Erythrura prasina* are found. The collected data is analyzed to find the abundance and the relative frequency of the bird species found in the location. The abundance is the number of individual from each species that is found during the observation. The calculation of the relative abundance of the bird species in Sendi-Gajah Mungkur is presented in the table 1. Afterwards, the abundance index value is divided into three categories: high (>20%), middle (15%-20%), and low (<15%).

From the species abundance calculation, it is known that *Collocalia linchi* has the highest abundance index of 48,21917808. The second highest abundance index belongs to *Zosterops palpebrosus* dan *Dicaeum sanguinolentum* with the abundance index of 4,657534247.

The existence frequency of bird species in Taman Hutan Raya Raden Soerjo, Mojokerto Regency is presented in table 2. From the existence frequency calculation, known that *Collocalia linchi* has the highest existence index of 93,75%. The second and the third highest existence frequency belong to *Dicaeum sanguinolentum* dan *Zosterops palpebrosus* with each index of 56,25% and 50%.

Table 1. Abundance of the bird species found in Sendi-Gajah Mungkur, Taman Hutan Raya Raden Soerjo, Mojokerto Regency.

No.	Spesies	Abundance (%)	No.	Spesies	Abundance (%)
1.	<i>Collocalia linchi</i>	48,22	21.	<i>Bradypterus seebohmi</i>	0,82
2.	<i>Zosterops palpebrosus</i>	4,66	22.	<i>Eurylaimus javanicus</i>	0,55
3.	<i>Dicaeum sanguinolentum</i>	4,66	23.	<i>Megalaima javensis</i>	0,55
4.	<i>Rhyticeros undulatus</i>	4,11	24.	<i>Ictinaetus malayensis</i>	0,55
5.	<i>Parus major</i>	3,01	25.	<i>Nisaetus bartelsi</i>	0,55
6.	<i>Megalaima armillaris</i>	2,74	26.	<i>Ficedula hyperythra</i>	0,55
7.	<i>Hemipus hirundinaceus</i>	2,74	27.	<i>Pneopigia pusilla</i>	0,55
8.	<i>Pericrocotus miniatus</i>	2,47	28.	<i>Culicicapa ceylonensis</i>	0,55
9.	<i>Ixos virescens</i>	2,19	29.	<i>Pitta guajana</i>	0,55
10.	<i>Megalaima australis</i>	2,19	30.	<i>Melacocincla sepiarum</i>	0,55
11.	<i>Aplonis panayensis</i>	1,92	31.	<i>Sitta frontalis</i>	0,55
12.	<i>Macropygia unchall</i>	1,64	32.	<i>Macropygia emiliana</i>	0,55
13.	<i>Hirundo striolata</i>	1,64	33.	<i>Orthotomus sepium</i>	0,55
14.	<i>Pycnonotus goiavier</i>	1,64	34.	<i>Chalcophaps indica</i>	0,27
15.	<i>Eumyias indigo</i>	1,37	35.	<i>Ducula lacermulata</i>	0,27
16.	<i>Pycnonotus aurigaster</i>	1,37	36.	<i>Treron griseicauda</i>	0,27
17.	<i>Splilornis cheela</i>	1,10	37.	<i>Pericrocotus cinnamomeus</i>	0,27
18.	<i>Sitta azurea</i>	1,10	38.	<i>Aethopyga mystacalis</i>	0,27
19.	<i>Lophozosterops javanicus</i>	1,10	39.	<i>Erythrura prasina</i>	0,27
20.	<i>Macropygia ruficeps</i>	1,10			



Based on Cahyono (2013), in Taman Hutan Raya Raden Soerjo, Mojokerto Regency was found less-recorded java-dwelling bird like *Gracula religiosa*, *Dicaeum agile*, *Dicaeum chrysorrheum*, *Zoothera andromedae*, *Ficedula narcissina*, *Strix leptogrammica*, *Phodilus badius*, and *Buceros rhinoceros*.

Table 2. Frequency of the bird species found in Sendi-Gajah Mungkur, Taman Hutan Raya Raden Soerjo, Mojokerto Regency.

No.	Spesies	Frequence (%)	No.	Spesies	Frequence (%)
1.	<i>Collocalia linchi</i>	93,75	21.	<i>Hirundo striolata</i>	12,5
2.	<i>Dicaeum sanguinolentum</i>	56,25	22.	<i>Macropygia ruficeps</i>	12,5
3.	<i>Zosterops palpebrosus</i>	50	23.	<i>Nicaetus bartelsi</i>	12,5
4.	<i>Rhyticeros undulatus</i>	37,5	24.	<i>Ficedula hyperythra</i>	12,5
5.	<i>Macropygia unchall</i>	37,5	25.	<i>Pycnonotus goiavier</i>	12,5
6.	<i>Megalaima armillaris</i>	37,5	26.	<i>Pneopigia pusilla</i>	12,5
7.	<i>Ixos virescens</i>	37,5	27.	<i>Culicicapa ceylonensis</i>	12,5
8.	<i>Parus major</i>	37,5	28.	<i>Chalcophaps indica</i>	6,25
9.	<i>Megalaima australis</i>	37,5	29.	<i>Ducula lacermulata</i>	6,25
10.	<i>Eumyias indigo</i>	31,25	30.	<i>Pitta guajana</i>	6,25
11.	<i>Hemipus hircundinaceus</i>	31,25	31.	<i>Treron griseicauda</i>	6,25
12.	<i>Splilornis cheela</i>	25	32.	<i>Melacocincla sepiarum</i>	6,25
13.	<i>Pycnonotus aurigaster</i>	18,75	33.	<i>Pericrocotus cinnamomeus</i>	6,25
14.	<i>Bradypterus seebohmi</i>	18,75	34.	<i>Sitta frontalis</i>	6,25
15.	<i>Pericrocotus miniatus</i>	18,75	35.	<i>Aplonis panayensis</i>	6,25
16.	<i>Eurylaimus javanicus</i>	12,5	36.	<i>Macropygia emiliana</i>	6,25
17.	<i>Sitta azurea</i>	12,5	37.	<i>Aethopyga mystacalis</i>	6,25
18.	<i>Lophozosterops javanicus</i>	12,5	38.	<i>Erythrura prasina</i>	6,25
19.	<i>Megalaima javensis</i>	12,5	39.	<i>Orthotomus sepium</i>	6,25
20.	<i>Ictinaetus malayensis</i>	12,5			

REFERENCES

- Cahyono, H. 2013. New Information About The Distribution of Less-Recorded Java-Dwelling Bird Species Found In Tahura Raden Soerjo, East Java. *ICBS*.
- Foto Biodiversitas, 2012. Biodiversitas Indonesia – Bhinneka Flora Fauna Indonesia. *FOBI*, vol. 02/ no. 02.
- Krebs, C.J. 1989. *Ecology The Experimental Analysis of Distribution and Abundance*. Harper and Rows Publication., New York.
- Mackinnon, J., K. Phillips and B. van Balen. 1998. *Burung – Burung di Sumatera, Jawa, Bali, dan Kalimantan*. Puslitbang Biologi – LIPI/ BirdLife Indonesia., Bogor.
- Mirsa, R. 1968. *Ecology Workbook*. Oxford and IBH Publishing Co., New Delhi.
- Gregory, R.D., W.G. David, and F.D. Paul. 2004. *Bird Cencus and Survey Technique*. Without Publisher.
- Rudyanto and W.M. Rombang. 2007. *Daerah Penting Bagi Burung Jawa & Bali*. PKA/Birdlife International-Indonesia Programme, Bogor.