

A rapid bird survey in Bukit Puar, Kerinci Seblat National Park; with notes on different survey methods

By Arum Setiawan

A rapid bird survey in Bukit Puar, Kerinci Seblat National Park; with notes on different survey methods

Muhammad Iqbal¹, Indra Yustian², Arum Setiawan², Rahmat Pratama Abdullah³ and Muhammad Isa⁴

¹KPB-SOS. Jl. Tanjung api-api km 10 Komplek PDK Blok E 1, Palembang 30152, Indonesia.

²Dept. Biology of FMIPA, University of Sriwijaya, Jl. Raya Palembang-Prabumulih km 32, Indralaya, Indonesia

³Community of Conservation, Dept. Biology of FMIPA, University of Sriwijaya, Indralaya, Indonesia

⁴Kerinci Seblat National Park Section V, Jl. Garuda km 7 Kayu Ara, Lubuk Linggau, Sumatera Selatan, Indonesia

Corresponding author: Muhammad Iqbal, Email: kpbsos26@yahoo.com

ABSTRACT

A rapid bird survey was carried out in Bukit Puar, Kerinci Seblat National Park, South Sumatra Province. Three survey methods were applied to assess bird diversity in this area: transect line, mist-netting and riparian survey. A total of 53 species from a total of 53 species from 27 families was recorded during survey. Among three methods applied, transect line is the most effective method to detect more bird species (45 species), followed by mist-netting (14 species) and riparian survey (nine species). There are 10 species protected by Indonesia law and five birds are listed as Near Threatened (NT) by International Union for Conservation of Nature or IUCN. These findings show that Bukit Puar still good habitat for various of birds, and the forest remaining should be protected.

ABSTRAK

Sebuah survei cepat untuk mengetahui keragaman burung telah dilakukan di Bukit Puar, Taman Nasional Kerinci Seblat, Provinsi Sumatera Selatan. Tiga metode survei digunakan dalam survei ini, yaitu: jalur transek (transect line), mist-netting dan survei dengan menyusuri sungai (riparian survey). Tercatat 53 jenis burung dari 27 famil dalam survei ini. Dari ketiga metode yang digunakan, metode jalur transek merupakan metode yang paling efektif untuk mendeteksi lebih banyak keragaman burung dengan 45 jenis, diikuti mist-netting dengan 14 jenis dan survei menyusuri sungai dengan 9 jenis. Tercatat juga 10 jenis merupakan jenis dilindungi oleh Pemerintah Indonesia dan lima jenis masuk dalam kategori terancam punah menurut International Union for Conservation of Nature atau IUCN. Hasil dari survei ini menunjukkan bahwa Bukit Puar masih merupakan habitat yang baik untuk keragaman burung, dan hutan yang masih tersisa disini sebaiknya tetap dilindungi.

Keywords: *Bird, Bukit Puar, Kerinci Seblat National Park, transect line, mist-netting, riparian survey*

INTRODUCTION

Kerinci Seblat National Park (KSNP) with a total area of 1.389.509ha (Kepmenhut No.420/Menhut-II/2004) is a largest National Park in Sumatra, spanning over four provinces: West Sumatra, Jambi, Bengkulu and South Sumatra (Anon, 2016). The area has great habitats diversity that spans over continuous forest from lowlands to montane, including some natural stands of tropical pine (MacKinnon and Philipps, 1993). KSNP has

been listed as an Important Bird Area (IBA), an Endemic Bird Area and World Heritage Site in Indonesia (Anon, 2016; Holmes and Rombang, 2001; Stattersfield, 1998). The park shelters several important populations of Sumatra's charismatic wildlife, including many Sumatran endemic birds (Cochrane and Cubitt, 2004; Myers, 2005).

The avian diversity in KSNP and adjacent areas comprises over 380 species, which include 17 of the 20 Sumatran endemics (Anon, 2002). Most ornithological exploration of KSNP have taken place in the central parts of the park or in areas adjacent to Gunung Kerinci (eg. Holden, 1997; Hurrel, 1989; Lambert and Howes, 1989; Simpson,

Submitted 21st October, 2016. Accepted 26th February, 2017

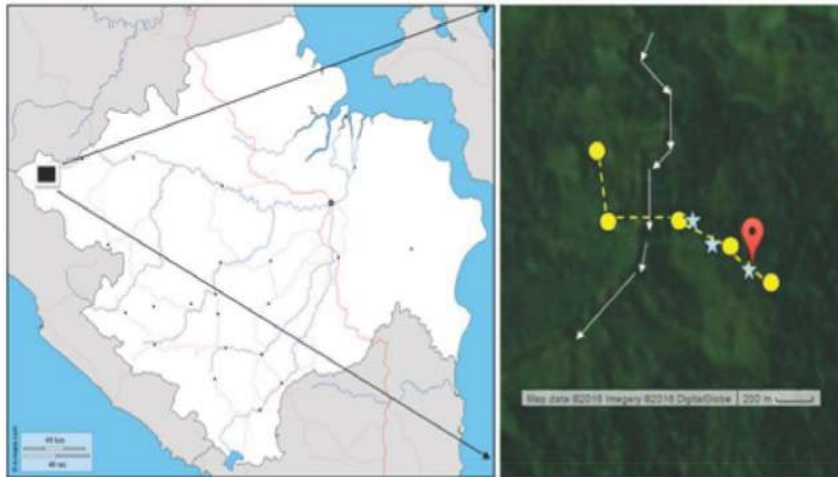


Figure 1. Location of survey at Bukit Puar, Kerinci Seblat National Park, South Sumatra province. Yellow circle with dotted line is transect line, blue star is mist-net stations, and white arrow show riparian survey tracks.

1995), whereas information about avifauna outside these areas remains little known. In South Sumatra, an area of 250.613ha of KNSP, the avifauna remains unstudied (Anon, 2016).

Bukit Puar is a hilly forest in a part of KSNP that is located in the province of South Sumatra, where the habitat remains relatively intact, yet with no information available on the fauna in Bukit Puar, including its bird diversity. This survey is the first bird diversity survey to be undertaken in the Bukit Puar area of KSNP.

METHODS

Study Area

The survey took place around Bukit Puar and its adjacent areas ($02^{\circ} 47'S$, $102^{\circ}23'E$) in KSNP (Fig. 1). The survey took place in approx 500ha of Bukit Puar. The area is under management area of subsection V or SPTN V (SPTN = Seksi Pengelolaan Taman Nasional Wilayah) of KSNP. Administratively, the site is located in Muara Kulam village, South Sumatra province. It consists of secondary dipterocarp forest with little encroachment, apart from low intensity selective illegal logging by local people. The topography is hilly with numerous riparian areas (Fig. 2).

Surveys

From 18-22nd April 2016, three survey were undertaken to rapidly assess the bird diversity in Bukit Puar. We applied standard methods for conducting survey, following protocols for rapid survey of terrestrial birds (eg. Bibby et al., 2000; Herzog et al., 2011). The survey methods used were line transect, mist-netting and survey by canoe along riparian zones. Identification of birds were done with the aid of field guides, mainly of MacKinnon and Phillipps (1993).



Figure 2. Bukit Puar consists of hilly secondary dipterocarp forest with little encroachment ©Muhammad Iqbal.

Five fixed-radius 100 m transect line surveys were conducted between sunrise to mid-morning. We recorded distance from observer (≤ 50 m or > 50 m, and time of observation of all birds that could be identified either based on vocalisation or direct observation.

Five mist-nets (15 x 3m, 3-4mm mesh) were deployed in the survey area. The nets were stretched between two poles and checked every two hours, or four times a day. Birds caught in the mist-nets were removed and placed in a cage for identification and morphometric measures.

Access to Bukit Puar from Muara Kulam village took place in canoe powered by a 15Hp outboard motor. This time was used to record birds and other wildlife along the river. A total of 6km over a duration of two hours was undertaken for riparian surveys around Bukit Puar and surrounding area.

RESULTS AND DISCUSSION

A total of 53 species from 27 families (taxonomy, scientific name and English name follow Sukmantoro

et al., 2007) was recorded during survey (Table 1). Among the three survey methods used, transect line survey resulted in most recordings (45 species), followed by mist-netting (14 species) and riparian zones survey (nine species). Only one observation of the Greater racket-tailed drongo was recorded across all three survey methods.

From 53 species recorded in Bukit Puar, 10 species are protected by Indonesia law (Noerdjito and Maryanto, 2001), and five species are listed as Near Threatened (NT) on the IUCN red-list (Birdlife International, 2016). Rufous-collared kingfisher is the only species recorded that is listed as both protected and NT.

Whereas the transect line resulted in more species of recorded birds (85% of total), mist-netting is an important tool to detect shy illusive species, such as small birds from the under-storey community (Rahman, 2002; Whitman et al., 1997). In this survey, mist-nets captured four species that were not recorded by the other survey methods: Green broadbill, Hooded pitta, Banded pitta and Chestnut-rumped babbler. The Green broadbill is a good sample of why mist-netting is important too.

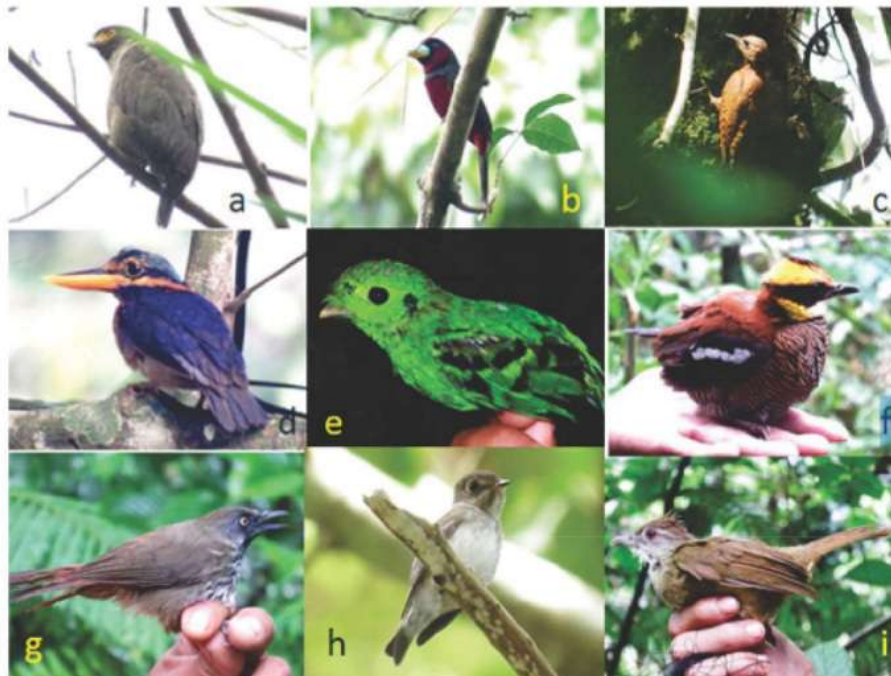


Table 1. A list of species recorded during 18-22 April 2016, and methods use to detect the occurrence of birds in Bukit Puar, Kerinci Seblat National Park. P = Protected by Indonesian law, NT = Near threatened (IUCN red-list status), 1 = Transect line, 2 = Mist-netting, 3 = Riparian survey with canoe.

Family	Scientific Name	English name	Methods		
			1	2	3
Accipitridae	<i>Unidentified Accipitridae</i> (P)	Eagle	+		
	<i>Spilornis cheela</i> (P)	Crested Serpent Eagle			+
Columbidae	<i>Treron sp</i>	Green Pigeon	+		
	<i>Ducula aenea</i>	Green Imperial Pigeon	+		
Psittacidae	<i>Loriculus galgulus</i>	Blue-crowned Hanging Parrot	+		
Cuculidae	<i>Cuculus sp</i>	Cuckoo	+		
	<i>Cuculus micropterus</i>	Indian Cuckoo	+		
	<i>Centropus bengalensis</i>	Lesser Coucal	+		+
Strigidae	<i>Ketupa ketupu</i>	Buffy Fish Owl			+
Apodidae	<i>Collocalia sp</i>	Swiftlet	+		
Hemiprocnidae	<i>Hemiproctne comata</i>	Whiskered Treeswift	+		
Alcedinidae	<i>Actenoides concretus</i> (P, NT)	Rufous Collared Kingfisher		+	+
	<i>Halcyon smyrnensis</i> (P)	White-throated Kingfisher	+		+
	<i>Alcedo meninting</i> (P)	Blue-eared Kingfisher	+		+
Bucerotidae	<i>Buceros rhinoceros</i> (P)	Rhinoceros Hornbill	+		
	<i>Anthracoseros sp</i> (P)	Hornbill	+		
Meropidae	<i>Nyctornis amictus</i>	Red-bearded Bee-eater	+		+
Capitonidae	<i>Megalaima rafflesii</i> (NT)	Red-crowned Barbet	+	+	
	<i>Megalaima mystacophanos</i> (NT)	Red-throated Barbet	+	+	
	<i>Megalaima australis</i>	Blue-eared Barbet	+		
Picidae	<i>Picus miniaceus</i>	Banded Woodpecker	+		
	<i>Micropternus brachyurus</i>	Rufous Woodpecker	+		
Eurylaimidae	<i>Corydon sumatranus</i>	Dusky Broadbill	+		
	<i>Eurylaimus ochromolus</i>	Black-and-yellow Broadbill	+		
	<i>Calyptomena viridis</i>	Green Broadbill		+	
	<i>Cymbirhynchus macrorhynchos</i>	Black-and-red Broadbill	+		
Pittidae	<i>Pitta sordida</i> (P)	Hooded Pitta		+	
	<i>Pitta guajana</i> (P)	Banded Pitta		+	
Campephagidae	<i>Hemipus sp</i>	Flycatcher-shrike	+		
Pycnonotidae	<i>Pycnonotus atriceps</i>	Black-headed Bulbul	+		
	<i>Pycnonotus aurigaster</i>	Sooty-headed Bulbul	+		
	<i>Pycnonotus melanicterus</i>	Black-crested Bulbul	+	+	
	<i>Pycnonotus brunneus</i>	Red-eyed Bulbul	+	+	
	<i>Criniger phaeocephalus</i>	Yellow-bellied Bulbul	+	+	
Chloropseidae	<i>Chloropsis cyanopogon</i> (NT)	Lesser Green Leafbird	+		
	<i>Chloropsis sonnerati</i>	Greater Green Leafbird	+		
	<i>Chloropsis cochinchinensis</i>	Blue-winged Leafbird	+		
Irenidae	<i>Irena puella</i>	Asian Fairy Bluebird	+	+	
	<i>Macronus gularis</i>	Striped Tit Babbler	+		

Timaliidae	<i>Stachyris maculata NT</i>	Chestnut-rumped Babbler		+	
	<i>Trichastoma bicolor</i>	Ferruginous Babbler	+	+	
	<i>Trichastoma rostratum</i>	White-chested Babbler	+		
Turdidae	<i>Copsychus saularis</i>	Oriental Magpie Robin	+		
Sylviidae	<i>Orthotomus ruficeps</i>	Ashy Tailorbird	+		
	<i>Prinia familiaris</i>	Bar-winged Prinia	+		
Muscicapidae	<i>Muscicapa dauurica</i>	Asian Brown Flycatcher	+		
Monarchidae	<i>Ficedula sp</i>	Flycatcher			+
	<i>Hypothymis azurea</i>	Black-naped Monarch	+		
Nectariniidae	<i>Arachnothera longirostra P</i>	Little Spiderhunter	+	+	
Dicaeidae	<i>Dicaeum sp</i>	Flowerpecker	+		
Dicruridae	<i>Dicrurus aeneus</i>	Bronzed Drongo	+		
	<i>Dicrurus paradiseus</i>	Greater Racquet-tailed Drongo	+	+	+
Corvidae	<i>Corvus enca</i>	Slender-billed Crow	+		
TOTAL			45	14	9

While Green broadbill is a common bird, it is often overlooked due to its behaviour, where it is often found stationary in the middle and high canopy and almost invisible (MacKinnon and Phillipps, 1993). For rapid bird censuses, however, transects line surveys are preferred to get an indication of species richness and abundance, since this method is less costly, less invasive, and less time-consuming (Arizaga et al., 2011).

As tropical landscapes become increasingly deforested, fragmented and human-dominated, riparian zones are becoming disproportionately important in connecting and harbouring populations of tropical forest organisms (Sekercioglu 2009). In South Sumatra, a bird survey was undertaken in Merang peat dome areas and Sembilang National Park (Goenner and Hasudungan, 2001, Iqbal, 2004, Waltert, 2008). Although surveys in riparian zones often result in low number of bird species, it is an important habitat that must be included in general biodiversity assessments. In this survey, we recorded three species Crested serpent eagle, Buffy fish owl and *Ficedula* flycatcher, that were not found elsewhere.

Birds are ideal subjects to assess an area for rapid biodiversity surveys, since they are the best known group of organisms in term of their taxonomy, biology, ecology, biogeography and conservation status (Herzog et al. 2011). Our studies in Bukit Puar suggest that the area is an important habitat for a range of bird species.

ACKNOWLEDGEMENT

We thank GIZ Bioclimate for funding this study. We are very grateful to Dr. Carl Traeholt and Dr. Wilson Novarino for their constructive suggestions and advises. Finally, thanks to our Muara Kulam biodiversity team who have valuable contribution: Doni Setiawan, Catur Prasetyo, Deny Noberio Gusna, Ina Aprilia, Rio Firman and Winda Indriati.

REFERENCES

- Anon. (2002). Management framework for Kerinci Seblat National Park 2002–2006. Kerinci Seblat Integrated Conservation and Development Project, Jambi, Indonesia.
- Anon. (2016). Taman Nasional Kerinci Seblat (TNKS). Seksi Pengelolaan TN. Wilayah V Lubuklinggau, Sumatera Selatan, Indonesia.
- Arizaga, J., Dean, J.I., Vilchels, A., Alonso, D. and A. Mendiburu. (2011). Monitoring communities of small birds: A comparison between mist-netting and counting. *Bird Study* 58: 291–301
- Bibby, C., Jones, M. and S. Marsden. (2000). Teknik-teknik ekspedisi lapangan survei burung. Birdlife International Indonesia Programme, Bogor, Indonesia.

- BirdLife International. (2016). IUCN Red List for birds. Downloaded from <http://www.birdlife.org> on 04/10/2016.
- Cochrane, J. and G. Cubitt. (2004). The national parks and other wild places of Indonesia. New Holland Publisher, London, UK.
- Goenner, C. and F. Hasudungan. (2001). Sembilang Monitoring Report No. 1 Juli/August 2001. Wetlands International-Asia Pacific Indonesia Programme/ Berbak Sembilang Project, Palembang, Indonesia.
- Herzog, S.K., O'Shea, B.J. and T. Pequeno. (2011). Toward a standardized protocol for rapid surveys of terrestrial bird communities. In Larsen, T.H. Core Standardized Methods for Rapid Biological Field Assessment. Conservation International, Arlington, USA.
- Holden, J. (1997). Bird list of Kerinci Seblat National Park, Sumatra and adjoining areas. Fauna and Flora International, Jambi, Indonesia. unpublished
- Holmes, D. and W.M. Rombang. (2001). Daerah penting bagi burung: Sumatera. PKA/Birdlife International-Indonesia Programme, Bogor, Indonesia.
- Hurrell, P. (1989). On the rediscovery of Schneider's Pitta in Sumatra. *Kukila* **4(1-2)**: 53-56.
- Iqbal, M. (2004). Pemantauan Kawasan Sembilang No. 9, Februari 2004. Laporan Teknis No. 82 Proyek Konservasi Terpadu Lahan Basah Pesisir Berbak Sembilang-Wetland International Indonesia Programme, Palembang, Indonesia.
- Lambert, F. and J.R. Howes. (1989). A recent sighting of Salvadori's Pheasant. *Kukila* **4(1-2)**: 56-58.
- Mackinnon, J. and K. Phillips. (1993). A field guide to the birds of Borneo, Sumatra, Java and Bali. Oxford University Press, UK.
- Myers, S. (2005). Kerinci-Seblat National Park, Sumatra, Indonesia. *Birding ASIA* **4**: 52-57.
- Noerdjito, M. and Maryanto, I. (2001). Jenis-jenis hayati yang dilindungi perundang-undangan Indonesia. Museum Zoologicum Bogoriense/LIPI/The Nature Conservancy/USAID, Cibinong, Indonesia.
- Rahman, M.A. (2002). Using mist-nets on canopy walkways in Malaysia to study canopy avifauna. *The Raffles Bulletin of Zoology* **50(2)**: 499-506.
- Serkecioglu, C.H. (2009). Tropical ecology: Riparian corridors connect fragmented forest bird populations. *Current Biology* **19(5)**: 210-213.
- Simpson, B. (1995). Sumatran Cochoa, *Cochoa beccarii*, on Gunung Kerinci, Sumatra. *Oriental Bird Club Bulletin* **21**: 50-52.
- Stattersfield, A.J., Crosby, M.J., Long, A.J. and D.C. Wege. 1998. Endemic Bird Areas of the World. Priorities for biodiversity conservation. BirdLife Conservation Series 7. Cambridge, UK.
- Sukmantoro, W., Irham, W., Novarino, W., Hasudungan, F., Kemp, N. and M. Muchtar. (2007). Daftar Burung Indonesia No. 2. The Indonesian Ornithologist's Union/LIPI/OBC Smythies Fund/Gibbon Foundation, Bogor, Indonesia.
- Waltert, M. 2008. Biodiversity assesment in the Merang peat dome area. South Sumatra Forest Management Project, Palembang, Indonesia.
- Whitman, A.A., Hagan, J.M., and N.V.L. Brokaw. (2007). A comparison of two bird survey techniques used in a subtropical forest. *The Condor* **99**: 955-965.

A rapid bird survey in Bukit Puar, Kerinci Seblat National Park; with notes on different survey methods

ORIGINALITY REPORT

15%

SIMILARITY INDEX

MATCH ALL SOURCES (ONLY SELECTED SOURCE PRINTED)

★biovalentia.mipa.unsri.ac.id

Internet

10%

EXCLUDE QUOTES ON

EXCLUDE
BIBLIOGRAPHY ON

EXCLUDE MATCHES < 1%