

## Short Communications

# Java Sparrow *Lonchura oryzivora* at Bali Barat National Park: Do They Still Persist?

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### ABSTRACT

The main purpose of the establishment Bali Barat National Park was to conserve the endemic endangered Bali Starling. However, based on data on 2004, one endangered species, Java Sparrow *Lonchura oryzivora* also resided in there. Current official report of sighting is ultimately required since it acts as reference in the management of a conservation area. We reported four sightings of Java Sparrow flocks occurred in June, 2021 at the Prapat Agung Peninsula, 28 individuals in total consisted of 13 adults and 15 juveniles, in a transition area of monsoon forest and savannah. The biggest flock sighted was eleven individuals. This study therefore confirmed that the Java Sparrow was still persisted at the Bali Barat National Park in 2021, in Prapat Agung Peninsula in particular.

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Bali Barat National Park is the only National Park in Bali, situated at two regencies namely Jembrana and Buleleng. It covers area of 19.002,89 hectares, consists of 15.587,89 hectares of land and 3.415 hectares of sea waters (Mahmud et al. 2015). The park has six types of terrestrial ecosystem, namely mangrove forest, coastal forest, monsoon forest, tropical forest, evergreen forest, and savannah (Santoso et al. 2019). The main purpose of the establishment of the Bali Barat National Park was to conserve the endemic endangered species Bali Starling *Leucopsar rothschildi* based on Ministry of Forestry Decree No. 493/Kpts-II/1995. Based on data on 2004, in Bali Barat National Park resided five threatened bird species: two critically endangered species (Bali Starling *Leucopsar rothschildi* and Grey-rumped Myna *Acridotheres tertius*), two endangered species (Milky Stork *Mycteria cinerea* and Java Sparrow *Lonchura oryzivora*), and one vulnerable species (Lesser Adjutant *Leptoptilos javanicus*) (BirdLife International 2021).

Java Sparrow belongs to the order Passeriformes and family Estrildidae. It is an endemic bird of Java and its adjacent isles, as well as Bali. This

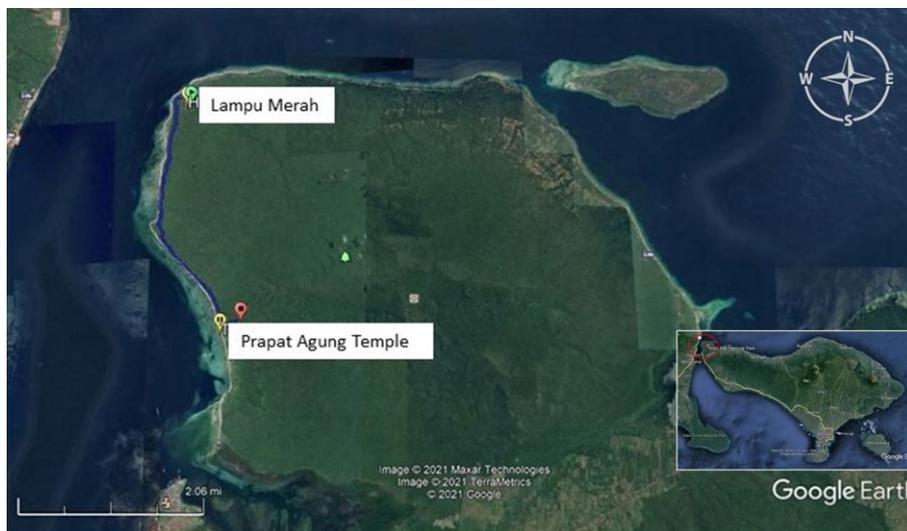
bird is characterized by white cheeks, black head, and large red beaks (MacKinnon & Phillipps 1993; Eaton et al 2016; Islam 2020). In the past, this bird can be found easily in the rice field area in a big flock. However, it is quite difficult to find them in the wild currently. In the wild, birds can be found in areas near rice fields/farms or grasslands. These grain-eating birds are often grouped and nomadic. In addition to eating seeds, especially rice grains, these birds also eat fruit and insects. The drastic decrease in the amount is mainly caused by illegal capture for pets. Its beautiful feather color makes this bird a target for collectors, even overseas (Yuda 2015; Chng et al. 2016). In addition, this bird is also considered as a pest that eats grains of rice thereby reducing crop yields. For that reason, large-scale capturing in the wild was occurred in the 1960-1970s. Another threat faced by Java Sparrow is habitat loss or habitat fragmentation due to land use change and pollution (Balen 1997; Yuda 2008). At present, Java Sparrow is protected by the Government of the Republic of Indonesia (P.106 / MENLHK / SETJEN / KUM.1 / 12/2018).

Past surveys in 1980s - 1990s, by Ash et al and van Balen, recorded the Java Sparrow at numerous sites within Bali Barat National Park (Balen 1997). However, more recent studies in 1998 by Surata (2000) and Muchtar & Nurwatha (2001), that reported the occurrence of the Java sparrow respectively at eight sites and ten other sites, were not included the Bali Barat National Park. Other survey conducted by M. Saifudin & Fathurohman in 2010 which provided other seven locality records (Yuda 2015) was also not reported the occurrence of Java Sparrow in Bali Barat National Park. Later, Bird-Life International (2021) reported Java Sparrow population in Bali Barat National Park still present based on 2004 record.

To assess the extension of Java Sparrow in the Park, we conducted this survey by using the opportunistic sampling method (De Barba et al. 2010; Neyens et al. 2019). Observers were on a car, drove slowly between Lampu Merah and Prapat Agung temple on a gravel road. The car speed was approximately 20 km h<sup>-1</sup>. When the bird was located, the car was stopped, and the observation was made. Observation was conducted using binocular Nikon Prostaff 8x42 6.3°. Photos were taken by using Nikon B700 60x optical zoom 4.3 - 258 mm (IMSW), Nikon D7100 ED AF-S Nikkor 70-300mm 1:4.5-5.6 G (GOW), and Canon 60D sigma 70-300 mm (EC), either from inside the car or outside by the car. The weather was recorded by using Accuweather application Version 14.9(3). The altitude was recorded by using compass smartphone application. Identification of plants, in where the Java Sparrow observed, referred to Steenis (2008).

During four months (June-September 2021) survey on Bali Starling population at Bali Barat National Park, we spotted the Java Sparrow at the first time on June 10<sup>th</sup>, 2021 at the Prapat Agung Peninsula (Figure 1). There were four sightings of Java Sparrow occurred in June 10<sup>th</sup>, 2021. The first to the third sightings were occurred along the drive on the gravel road between Lampu Merah and Prapat Agung temple, whereas the fourth was when the

authors conducted observation on Bali Starling population. The weather (12.00 – 16.00 Central Indonesia Time) recorded was partly sunny to cloudy, the air temperature was between 29 – 34°C, real feel temperature was 35-40°C, real feel shade temperature was 32-38°C, wind speed was 13-20 km h<sup>-1</sup>, humidity was 58-66%, and cloud cover was 50 – 67%.



**Figure 1.** Map of Prapat Agung Peninsula at the Bali Barat National Park in where the Java Sparrow *Lonchura oryzivora* sighting was occurred. Source of maps were from Google Earth Pro 2021.

The first flock was sighted at 13.05 Central Indonesia Time (CIT), in a transition area of monsoon forest and savannah, located at 10 m asl. Seven birds were seen flying from coastal area direction, then perched on upper branches of a pilang *Acacia leucophloea* tree. They consisted of two adults and five juvenile individuals (Figure 2). The tree height was approximately 8 m.



**Figure 2.** The first flock of Java sparrow *Lonchura oryzivora* sighted at Prapat Agung Peninsula, Bali Barat National Park in 10<sup>th</sup> June, 2021. Two individuals (A) were

juvenile and adult, whereas one adult and four juveniles were on picture B. One individual was having its head out of frame. Pictures C and D were the same flock of Java Sparrow taken from different angle. Photos were taken by IMSW (A,B) and EC (C,D).

The second flock was sighted at 13.15 CIT, also in a transition area of monsoon forest and savannah, located at 10 m asl. Eleven individuals were sighted, consisted of six adults and five juvenile individuals. They were initially perching on branches of pilang *Acacia leucophloea* tree, unfortunately, they were disturbed by our arrival and moved away, by several short flights among trees. The third flock was sighted at 14.13 CIT, in savannah located at 10 m asl. The birds were seen hopped out from sedges vegetation (Figure 3), *Carex* sp. (ordo Poales; family Cyperaceae) toward the gravel road. They were five individuals, consisted of four adults and one juvenile.



**Figure 3.** The sedges vegetation *Carex* sp. from where the third sighting of Java Sparrow *Lonchura oryzivora* was occurred at Prapat Agung Peninsula, Bali Barat National Park. Photo was taken by IMSW.

The fourth sighting was occurred at 14.45 CIT. Five individuals Java Sparrow were seen, consisted of one adult and four juvenile individuals. They perched on top branches of a pilang *Acacia leucophloea* tree. The tree was approximately 10 m in height. Only juvenile birds were clearly captured in photo (Figure 4).

In total we recorded 28 individuals of Java Sparrow, consisted of 13 adults and 15 juvenile individuals, in June 10<sup>th</sup> 2021 at Prapat Agung Peninsula, Bali Barat National Park. All those birds observed were moving from coastward to inland direction, and our car was moving constantly forward. The distance between the spot of sightings were ranging from 600 m to 900 m. We, therefore, ascertain that those birds were counted once only. No

more sightings, instead of in June 10<sup>th</sup> 2021, was occurred during our four months (from June to September 2021) observation at Prapat Agung Peninsula, Bali Barat National Park. However, one big flock, approximately 20 individuals, was observed (by MU) in mangrove forest, in muddy patches and in cave area above the Brumbun Bay- Prapat Agung Peninsula in April 2020. This nomadic species might spend their time in Prapat Agung Peninsula from April to June. There were not any current (from 2010 onwards) scholar articles on the existence of Java Sparrow in Bali (see also Yuda 2018). A survey by Rosyadi et al. (2019) in Gunung Sewu Geopark, Yogyakarta observed several flocks with number ranging from three to fifty individuals Java Sparrow per flock.



**Figure 4.** The fourth sighting of Java Sparrow *Lonchura oryzivora* at Prapat Agung Peninsula, Bali Barat National Park. Photos were taken by IMSW (A) and GOW (B).

Their occurrence could be related to their foraging behaviour. This species was found in the transition area of monsoon forest and savannah at Prapat Agung Peninsula. During dry season, savannah might provide plenty of seeds, i.e., from Poales vegetation such as *Carex* sp. for them to forage in. A study by Marone et al. (2008) in diet and seed selection patterns of seed-eating birds in desert revealed that 83% of seeds in bird stomachs were grass seeds (ordo Poales). Meanwhile, they also could use trees in monsoon forest for perching, resting, or seeking protection from the potential predator or from the harsh weather. The real feel air temperature recorded from Accuweather application on that day was 35-40°C, whereas the real feel shade temperature was 32-38°C. When endothermic animals, such as birds, were exposed to high environmental temperatures, they can adjust their behaviour (e.g., reducing activity) or their physiology (e.g., increasing the rate of evaporative water loss) in order to maintain their body temperature within tolerant

limits (Du Plessis et al. 2012). For passerines, their thermoneutral zone was from 25 to 35°C (Yuni & Rose 2005). The presence of juvenile individuals, along with the adult in each flock sighted, indicated that Bali Barat National Park might also provide sources required for their breeding.

The finding of this survey was field evidence that the Java Sparrow was still present in Bali Barat National Park. A total of 28 individuals, consisted of 13 adult and 15 juvenile individuals, was observed in a transition area of monsoon forest and savannah in June 2021. The biggest flock sighted was eleven individuals. More systematic populations and further studies, i.e., ecological and biosystematics, are suggested for the conservation of the endangered and endemic Java Sparrow.

### AUTHORS CONTRIBUTION

LPEKY, IMSW, and PY designed the research, collected and analyzed the data, and wrote the manuscript. MU, GOW, and EC collected and analyzed the data. LPEKY supervised all the process.

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### CONFLICT OF INTEREST

LPEKY, IMSW, MU, GOW, EC, and PY declare that they have no conflicts of interest.

### REFERENCES

- Balen, S. van, 1997. *Java sparrow Padda oryzivora*, Bogor: PHPA/BirdLife International Indonesia Programme.
- BirdLife International, 2021. IUCN Red List for birds. Available at: <http://www.birdlife.org/> [Accessed October 19, 2021].
- Chng, S.C.L.C., Eaton, J.A. (Conservationist) & Traffic Southeast Asia (Program), 2016. *In the market for extinction : Eastern and central Java*, Petaling Jaya, Selangor, Malaysia: TRAFFIC.
- De Barba, M. et al., 2010. Comparing Opportunistic and Systematic Sampling Methods for Non-invasive Genetic Monitoring of a Small Translocated Brown Bear Population. *Journal of Applied Ecology*, 47, pp 172-181. doi: 10.1111/j.1365-2664.2009.01752.x
- Du Plessis, K.L. et al., 2012. The Cost of Keeping Cool in a Warming World: Implications of High Temperatures for Foraging, Thermoregulation, and Body Condition of an Arid-zone Bird. *Global Change Biology*, 18(10), pp. 3063-3070. doi: 10.1111/j.1365-2486.2012.02778.x.

- Eaton, J.A. et al., 2016. *Birds of the Indonesian Archipelago- Greater Sunda and Wallacea*, Barcelona: Lynnx.
- Islam, K., 2020. Java Sparrow (*Lonchura oryzivora*), version 1.0. In S. M. Billerman, ed. Ithaca, NY, USA.: Cornell Lab.
- MacKinnon, J. & Phillipps, K., 1993. *A field guide to the birds of Borneo, Sumatra, Java and Bali*, Oxford: Oxford University Press.
- Mahmud, A., Satria, A. & Kinseng, R.A., 2015. Historical Analysis and Centralized Approach in Management of Bali Barat National Park. *Jurnal Analisis Kebijakan Kebutanan*, 12(2), pp.159–172.
- Marone, L. et al., 2008. Can Seed-eating Birds Exert Top-down Effect on Grasses of the Mone Desert? *Oikos*, 117, pp. 611-619. doi: 10.1111/j.0030-1299.2008.16506.x
- Muchtar, M. & Nurwatha, P.F., 2001. *Gelatik jawa dan jalak putih: status dan upaya konservasi di Jawa dan Bali [Java Sparrow and Black-winged Starling: status and conservation effort in Java and Bali]*, Bandung: Yayasan Pribumi Alam Lestari.
- Neyens, T. et al., 2019. Mapping Species Richness Using Opportunistic Samples: A Case Study on Ground-Floor Bryophyte Species Richness in the Belgian Province of Limburg. *Science Report*, 9, pp. 19122, doi: 10.1038/s41598-019-55593-x
- Rosyadi, I., et al., 2019. Conservation of Java Sparrow *Lonchura oryzivora* in Gn Sewu Geopark, Yogyakarta Province, Java, Indonesia. *Birding ASIA*, 32, pp. 34-37.
- Santoso, R.F. et al., 2019. Keanekaragaman dan Status Konservasi Aves Di Jalur Cekik-Ambyasari dan Tegal Bunder-Prapat Agung Taman Nasional Bali Barat. In *Seminar Nasional Pendidikan Biologi dan Saintek (SNPBS) ke-IV*. Universitas Muhammadiyah Surakarta. Surakarta.
- Steenis, V., 2008. *Flora Pegunungan Jawa*, Jakarta: PT Pradnya Paramita.
- Surata, S.P.K., 2000. *Filogeografi intraspesies gelatik Padda oryzivora (L.) (Passeriformes: Ploceidae) di Pulau Bali*. Bogor: Institut Pertanian Bogor.
- Yuda, P., 2008. *Conservation genetics of the Java sparrow (Padda oryzivora) and an analysis of its viability*. Cairns: James Cook University.
- Yuda, P., 2015. *Bio-ekologi dan Konservasi Gelatik Jawa (Padda oryzivora)*, Yogyakarta: Cahaya Atma Pustaka.
- Yuda, P., 2018. Kesenjangan Informasi Bio-ekologi Jenis Burung Prioritas Nasional dan Potensi Pendekatan Citizen Science di Indonesia. Makalah Pembicara Kunci pada Konferensi Peneliti dan Pemerhati Burung di Indonesia IV, di Universitas Negeri Semarang, 8-10 Februari 2018
- Yuni, L.P.E.K. & Rose, R., 2005. Metabolism of Winter-acclimatized New Holland Honeyeaters *Phylidomyris novaehollandie* from Hobart, Tasmania. *Acta Zoologica Sinica*, 51(2), pp. 338-343.