

OBC-FUNDED: CONSERVATION UPDATE

BigMonth2020: citizen science event helps fill gaps in Java and Bali's bird distribution data

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In memory of our friend Arfah Nasution, who sadly passed away in 2020 and will be badly missed; she was a dedicated conservationist in Indonesia and did everything with a smile on her face.

Introduction

Indonesia has the second highest number of threatened birds globally and the threat posed by illegal bird-trapping for the cage-bird trade, compounded by ongoing habitat loss, has led to the declaration of an 'Asian Songbird Crisis' (Lee *et al.* 2016, Hughes 2017, BirdLife International 2020). These pressures are nowhere more acute than on Indonesia's most densely populated island, Java, which is home to more than 140 million people. There may be more than 70 million birds in captivity across Java (Marshall *et al.* 2020a), perhaps outnumbering those in the wild on the island. Many Javanese birds once common and easy to see appear to have declined precipitously (Eaton *et al.* 2015, Sykes 2017, Nijman *et al.* 2019), yet our knowledge of the distribution of most species is inadequate, with occurrence data lacking for large areas. Local biodiversity monitoring programmes can increase our understanding of the effects of environmental

change on bird distributions while simultaneously providing opportunities for capacity-building, environmental education and public outreach (Sekercioğlu 2012, Shirk *et al.* 2012). With this in mind, a proposal for a birdwatching event for Java and Bali was endorsed at a meeting of the IUCN Asian Songbird Trade Specialist Group in March 2019. The project's aim was to foster interest in the social and environmental value of birdwatching in local birding communities by setting a target to increase coverage of bird occurrence data across Java and Bali and contribute to the production of Indonesia's first bird atlas (*Atlas Burung Indonesia*).

After six months of initial planning, researchers from Manchester Metropolitan University (MMU), UK, teamed up with two Indonesian organisations, Birdpacker, a grassroots group of birdwatchers based in Java who advocate for bird conservation and have developed *Burungnesia* (a mobile app in which geo-referenced lists of bird observations can be recorded and submitted to a central database), and the Indonesian Ornithologists' Union (IdOU), which mostly consists of academics and staff from local conservation NGOs. We planned a month-long birdwatching event named 'BigMonth2020' for

Plate 1. Stuart Marsden birding with Arfah Nasution around the Cikananga Wildlife Center, Java, Indonesia, January 2020.



STUART MARSDEN

Plate 2. Sangkar White-eye *Zosterops melanurus* recorded near Yogyakarta, Java, during BigMonth2020, January 2020.



PANJI GUSTI AKBAR



Plate 3. Twitter post summarizing progress at the halfway mark, January 2020.

January 2020, aiming to attract as many participants—and hence to obtain as many bird records from as many 6 x 6 km squares (into which Java and Bali was divided)—as possible. We sought funding to remove some of the barriers that may exist for potential participants such as equipment and the financial resources to visit areas with the biggest gaps in bird occurrence data (Winnans *et al.* 2018). We also developed a prize competition to give added incentives to participate. The total budget for BigMonth2020 amounted to US\$7,400: US\$7,000 was awarded by the Oriental Bird Club (OBC), the remainder by Idea Wild. As well as the incentives and field expenses, this budget covered the modest salaries of staff employed by Birdpacker to work on all aspects of the event. We officially announced BigMonth2020 at the annual Indonesian Birdwatchers Meeting (PPBI) in Purwokerto, Java, on 1 November 2019, and from December 2019 Birdpacker led a social media campaign to increase public awareness of the event and published detailed information via their website (<https://www.birdpacker.com/big-month>).

BigMonth2020 as it happened

Recording for BigMonth2020 began on 1 January 2020 and within four days we had already surpassed 1,000 lists of bird observations (a 'list' comprises the bird species recorded by an observer on a single visit to a location of their choosing). Prior to the start of BigMonth2020, we had already awarded grants of IDR 10 million (US\$700) to 28 applicants; after the first week we had accepted applications for an additional IDR 11 million. The Birdpacker team posted items on their social media channels (Instagram and Facebook) almost daily—summaries of data accumulation, identification tips and competition updates. The main prize competition involved points awarded for every survey square



Plate 4. Twitter post of the final outcome and some highlights of BigMonth 2020, January 2020.

visited, with bonus points when submitting lists from survey squares with no existing occurrence data. Meanwhile, the MMU partners posted regularly on Twitter in English to attract attention from the wider conservation community.

Data continued to accumulate rapidly and by the halfway stage we had reached 6,919 bird lists consisting of 38,739 bird records. Social media posts from Birdpacker regularly received more than 200 'likes' on Instagram and participants shared their birdwatching highlights tagged '#BigMonth2020'. We encouraged sharing such posts by offering a prize (a copy of Eaton *et al.*'s *Birds of the Indonesian Archipelago* field guide) to the best social media influencer (winner: Desi Ayu Triana). On 18 January, we publicised the MMU team's visit to Birdpacker at their headquarters in Batu, East Java. This visit allowed some additional incentives to be planned and some bird lists to be generated in the surrounding area. Later, OBC chairman John Gregory also visited the project, going with the Birdpacker team to Alas Purwo National Park, East Java. To increase coverage in the final week, we identified the five largest remaining gaps in occurrence data and offered an extra round of funding to anyone who could visit the areas in question (11 field trips resulted). The overall spend on field trips came to IDR 26 million (US\$1,850). On 1 February, Birdpacker released a summary of the data gathered, announced the competition results, and promoted a short online questionnaire to gather feedback and demographic data from the participants. Every participant responding to the questionnaire was sent a BigMonth2020 T-shirt as a memento.

Participation

A total of 373 people participated in BigMonth2020. Of these, 195 responded to our online questionnaire,



Plate 5. OBC Chairman John Gregory visiting the Birdpacker team to record birds, January 2020.

providing a picture of the participant demographics. A quarter of respondents were female and two-thirds were under 30 years old, revealing a different demographic from other popular bird-related pursuits in Indonesia, namely bird-keeping, breeding and songbird contests, which are dominated by middle-aged men and older (Jepson & Ladle 2005, Marshall *et al.* 2020b). Most respondents lived in East Java, Yogyakarta and Central Java, broadly reflecting the distribution in Java of bird clubs and universities with a focus on biology. Among participants, we noted various types of engagement with the event, from families visiting their local urban greenspace to small groups and lone observers travelling long distances to remote, little-watched areas. The top 10 observers in the overall prize competition (winner: Rohmat Subandriyo) visited an average of 200 survey squares each, covering hundreds of kilometres. These recorders, and others who visited the areas we identified towards the end of the month, played a significant role in increasing coverage. Among them, Arfah Nasution and her team from Cikananga Wildlife Center received some expenses to fill gaps in south-west Java. There were some impressive family efforts as well: Mas Untung Sarmawi, Dewi Sasmita and their daughter Arya Rayhana travelled extensively around Bali recording bird lists. A group of 11 students from the Srigunting Biologi UNESA bird club received a grant to visit Madura for a week, and they covered nearly every survey square on the island, almost none of which had data before BigMonth2020.

Geographical and species coverage

A total of 102,887 bird records from 22,055 bird lists were uploaded to the *Burungnesia* app during



Plate 6. Mh Badrut (left) presented with his runner-up certificate by Imam of Birdpacker, February 2020.

BigMonth2020, three times the number of bird records generated by *Burungnesia* in the three years since its release. A certain level of spatial bias in data recording (urban centres in Java and Bali, along highways) was to be expected (Dennis & Thomas 2000), but as the month wore on, abetted by the points-based competition incentives, observers travelled further to reach unvisited squares. By the end of the event we had more than doubled the coverage of bird occurrence data, from just 32% of survey squares prior to BigMonth2020 to 71% afterwards. The amount of data submitted increased steadily through the month, with an average of 366 bird lists submitted per day in the first week rising to 1,358 in the last. This was possibly due to the prize competition incentive but may have been a result of the social media promotions and a snowball effect of its success.

As many as 353 bird species were recorded across Java and Bali during BigMonth2020, representing 74% of all recorded species for the islands excluding vagrants (Lepage 2020), following the taxonomy of HBW & BirdLife International (2019). These included 27 species treated as threatened by the IUCN (14 Vulnerable, nine Endangered, four Critically Endangered; Table 1) (BirdLife International 2020), although there was an enormous increase in terms of the number of records of many 'common' species: 29 species were recorded more than 500 times, including Common Iora *Aegithina tiphia*, Brown-throated Sunbird *Anthreptes malacensis* and Javan Kingfisher *Halcyon cyanoventris*. Some of these commoner species could be used as indicators for systematic biodiversity monitoring efforts in the future (Gregory & van Strien 2010). Sadly, but significantly,

Table 1. Critically Endangered and Endangered bird species recorded during BigMonth2020.

Species	IUCN Red List status	No. of records	No. of survey squares
Bali Myna <i>Leucopsar rothschildi</i>	CR	15	8
Christmas Frigatebird <i>Fregata andrewsi</i>	CR	5	3
Javan Blue-banded Kingfisher <i>Alcedo euryzona</i>	CR	3	1
Grey-rumped Myna <i>Acridotheres tertius</i>	CR	2	1
Milky Stork <i>Mycteria cinerea</i>	EN	33	16
Java Sparrow <i>Lonchura oryzivora</i>	EN	23	16
Javan Hawk-eagle <i>Nisaetus bartelsi</i>	EN	17	13
Javan Leafbird <i>Chloropsis cochinchinensis</i>	EN	4	3
Javan White-eye <i>Zosterops flavus</i>	EN	4	2
Far Eastern Curlew <i>Numenius madagascariensis</i>	EN	3	3
Green Peafowl <i>Pavo muticus</i>	EN	3	2
Great Knot <i>Calidris tenuirostris</i>	EN	1	1
Greater Green Leafbird <i>Chloropsis sonnerati</i>	EN	1	1

the project's data also reflected the decline of many Javan species, primarily due to trapping pressure. Formerly one of Java's commonest lowland species (van Balen 1999), the Sangkar White-eye *Zosterops melanurus* (formerly Oriental White-eye) was only recorded 66 times. But by contrast Javan Myna *Acridotheres javanicus*, a Vulnerable species with relatively few known sites prior to the event, was recorded in 108 survey squares, including newly found locations across Central and East Java, suggesting a historical lack of survey effort there. Javan Coucal *Centropus nigrorufus*, also considered Vulnerable, followed a similar pattern and was recorded for the first time in various locations across Central and East Java.

Future prospects

BigMonth2020 surpassed everyone's expectations in its uptake by local birdwatchers and the scale of some individual contributions, as well as in the general positivity that emerged before, during and after the event. We hope it will come to be seen as a great step forward for Indonesian civil society and citizen science. In one month, bird data coverage across Java and Bali was significantly increased, in particular for common birds, but notably for some threatened species as well. Of course, the Indonesian birdwatching community existed long before the event—IdOU was founded in 2004, the Indonesian Bird Atlas project in 2013 and Birdpacker in 2016—but BigMonth2020 seems to have sparked a surge in activity among Indonesian birdwatchers, the best illustration of this being that the Birdpacker team assembled for BigMonth2020 stayed together afterwards to work tirelessly to complete the Indonesian Bird Atlas project (published in December 2020). This

provides up-to-date distribution data for all Indonesian birds in one book in the national language, Bahasa Indonesia, and raises new awareness of bird conservation issues in the country, hopefully at the policy-making level—a remarkable achievement made possible by the endeavour of citizen scientists.

BigMonth2020 has shown what citizen science projects in Indonesia could achieve. Looking to future 'big months', we would like to see data gathered that will enable us to monitor population and distribution changes of common species more effectively. To achieve this, we will need more stringent systematic methods and to gather additional metadata for every bird list, so that observers record survey effort and indicate whether they recorded all the species they encountered (Fink *et al.* 2020). However, to achieve this at a large scale we will need to continue to work to remove some of the barriers to participation: the lack of fieldwork equipment indicated by our questionnaire respondents—half did not own binoculars—highlights the need to get equipment to people who want to contribute to events like ours, and illustrates the value of initiatives like the RSPB's second-hand binocular scheme (RSPB 2020). After the coronavirus pandemic we hope to see BigMonth return with a 2022 edition in an Indonesia-wide format. While Java and Bali are among the 'easiest' islands to survey in terms of logistics, any effort elsewhere would increase data coverage and share the social benefits of citizen science more widely (Bonney *et al.* 2009). Most importantly, it would make BigMonth an Indonesian event, a desire made clear in the questionnaire feedback we received. Such an event could be overseen centrally by Birdpacker, with regional

ADY KRISTANTO



Plate 7. Ady Kristanto's daughters recording birds at Kebun Ide, Jakarta, Java, January 2020.



NIKITA PRIMA

Plate 8. Sita took her students from Darul Ulum Muhammadiyah Galur Junior High School to record birds near Yogyakarta, January 2020.

DEWI SASMITA



Plate 9. Mas Untung, Dewi Sasmita and their daughter Arya Rayhana, travelled around Bali recording birds, January 2020.



NIKITA PRIMA

Plate 10. Cindy out birding near Yogyakarta, January 2020.

hubs managing survey effort on each island. Considering the data and enthusiasm generated by BigMonth2020, the modest investment that would be necessary is surely worthy for such a cause. Indeed, it has the makings of a model that other countries in Asia may choose to adopt for their own monitoring schemes.

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