Short Communication

Emerging evidence shows the global importance of the Boeung Prek Lapouv Protected Landscape, Cambodia for yellow-breasted buntings *Emberiza aureola*

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Paper submitted 29 December 2021, revised manuscript accepted 14 October 2022.

The yellow-breasted bunting *Emberiza aureola* is a globally threatened migratory passerine that winters widely across southern China and continental Southeast Asia, west to northeast India, Nepal, and Bangladesh (Davaasuren *et al*., 2019; BirdLife International, 2021; Heim *et al*., 2021). The species used to be one of the commonest birds in Eurasia, being described by some authors as 'superabundant' (e.g., Kamp *et al*., 2015), and has a wide Palaearctic breeding distribution stretching from Fennoscandia to eastern Russia and Japan (Dementiev & Gladkov, 1951–1954; McClure, 1974; Beerman *et al*., 2021; BirdLife International, 2021). However, the global population of yellow-breasted bunting has suffered a major decline due to unsustainable levels of hunting for human consumption, and potential habitat loss and degradation (McClure & Chaiyaphun, 1971; Kamp *et al*., 2015; Heim *et al*., 2021). An estimated two million individuals were taken for food and merit release in Thailand in one year alone in the 1970s (McClure, 1974), and comparably large numbers from Cambodia in the 2000s (Gilbert *et al*., 2012). Large numbers are also reported to be trapped for consumption in China (Chan, 2004) and large seizures of the species remain regular (Heim *et al*., 2021).

Since the 1990s, global populations of yellow-breasted buntings have declined by almost 90% while the breeding range has contracted eastward (Kamp *et al*., 2015), with declines reported from Russia, Japan, and Korea (Tamada *et al*., 2014, 2017) and at stopover localities in South Korea (Choi *et al*., 2020; Park *et al*., 2020; Heim *et al*., 2021). The species was uplisted to Critically Endangered in 2017 (BirdLife International, 2021). Despite a good understanding of the extent of its breeding range, the wintering distribution of the species remains poorly defined and new sites are continually being discovered, including in Thailand, Myanmar and Cambodia (Chan & Li, 2017; BANCA, 2019), as well as eastern India (Viswanathan, unpubl.data, 2021).

In Cambodia, yellow-breasted buntings occur as a regular winter visitors and have been recorded from November to May (Thomas & Poole, 2003; Goes, 2013; Chan & Li, 2017; CBGA, 2019; SVCT, 2021), although the species may arrive earlier based on observations from Laos and Vietnam (Duckworth, unpubl. data, 2022). Several parts of Cambodia are known to include wintering sites for yellow-breasted buntings, especially in the Tonle Sap floodplain and in the Eastern Plains along the lower Mekong floodplains (Thomas & Poole, 2003; Goes, 2013), and these may form important wintering sites for the species in Southeast Asia given the large numbers counted, and the presence of relatively intact floodplain wetlands. Where found, the species typically occurs in flocks from tens to several

CITATION: Ly S., Bunnath Z.S., Yong D.L., Bou V. & Chheoun S. (2022) Emerging evidence shows the global importance of the Boeung Prek Lapouv Protected Landscape, Cambodia for yellow-breasted buntings *Emberiza aureola*. *Cambodian Journal of Natural History*, **2022**, 78–83.

hundred individuals in recent years, although larger congregations were documented in the past in Lao PDR (Duckworth, unpubl. data, 2022). For example, an estimated 250 individuals were recorded in Kratie Marsh in 2016–2017 (BICP, 2019), 300 individuals were observed at the Stoung-Chikreng Bengal Florican Conservation Area and 300 were found at Bakan Grassland in 2019 (BICP, 2019). Counts exceeding a thousand were also reported from Krous Krom and Prey Veng during the early 2000s (Thomas & Poole, 2003; Goes, 2013). In southeast Cambodia on the lower Mekong floodplains, the species had only been recorded sporadically in the wetlands of the Boeung Prek Lapouv Protected Landscape (BPL; 10°43′N, 105°01′E; Fig. 1), which was based on incidental observations of small groups of 4–13 individuals in 2015 and 2016 (BICP, unpubl. data, 2020), with none thereafter. To date, there have been no targeted surveys of the species at this site despite apparently suitable wintering habitats in the form of reedbeds, grassland and associated scrubby vegetation. As with other parts of Southeast Asia and southern China (Lekagul & Round, 1991; Viney *et al*., 1996; Round, 2008), the known wintering habitat of the species in Cambodia largely occurs in cultivated areas such as rice fields and natural grasslands, and the species is known to use scrubby margins of paddy fields for foraging, and dense reedbeds, grassland and associated scrub for roosting (Lekagul & Round, 1991; Round, 2008; BirdLife International, 2021).

The extensive floodplain grasslands in BPL provide habitat for several bird species dependent on seasonal freshwater wetlands and the site is one of few remaining areas of natural grassland in the upper Mekong Delta that support large numbers of the sarus crane *A. antigone sharpii* annually during their non-breeding season, alongside other waterbird species such as the greater adjutant *Leptotilos dubius* and lesser adjutant *L. javanicus* (Yav, 2014; Seng *et al*., 2015; Tran *et al*., 2020). The wetlands also provide habitat for several threatened and near-threatened migratory birds during the northern winter months (Sep–Mar) including yellow-breasted bunting and black-tailed godwit *Limosa limosa* (BICP, unpubl. data, 2020), and support high levels of biodiversity. Here, we report the results of fieldwork in BPL in 2020–2021 and present new records of wintering yellow-breasted bunting at the site which covers ca. 8,035 ha and was established as a protected area under the category of 'Protected Landscape' by the Royal Government of Cambodia in 2016.

Given the tendency of yellow-breasted buntings to flock in their wintering grounds, counts at roosting sites are preferred for surveying the species rather than standardised transects, and these have been conducted

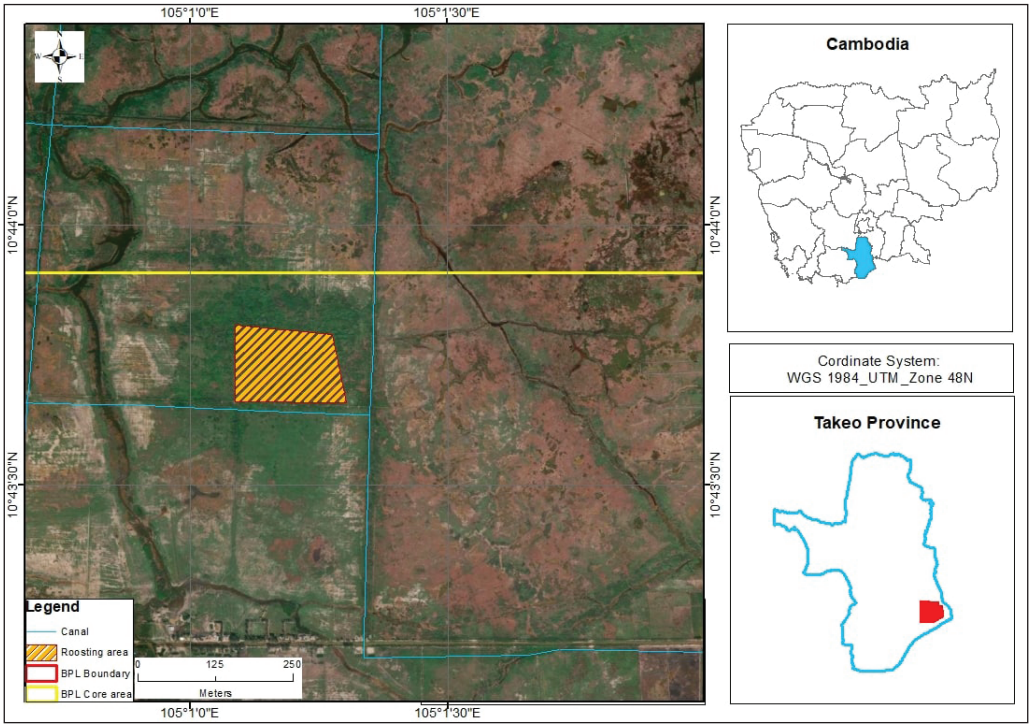

Fig. 1 Roosting area of yellow-breasted buntings in the Boeung Prek Lapouv Protected Landscape.

Fig. 2 Area of dense grasses and reeds identified as one of the main roosting sites of the yellow-breasted bunting in the Boeung Prek Lapouv Protected Landscape.

Fig. 3 Adult male yellow-breasted bunting in the Boeung Prek Lapouv Protected Landscape.

Fig. 4 Group of yellow-breasted buntings in dense grasses at the roosting site in the Boeung Prek Lapouv Protected Landscape.

in other parts of its range (e.g., Nepal, see Bhusal *et al*., 2020). We identified the roosting site for our surveys (Fig. 1) based on incidental observations of the species during regular fieldwork targeting sarus cranes. The crane surveys comprise point counts and transect surveys and are typically carried out by a team of five rangers and NatureLife staff based in BPL. One known area of BPL covered with dense reedbeds and other grasses where the buntings were observed in the past was surveyed for sarus cranes from November to December 2020 during our regular crane census. These surveys first recorded the buntings on 30 December 2020 during fieldwork along 1 km transects that traverse the roost area. Thereafter, we formed two survey teams and gathered at the roost site (Fig. 2) where we counted the birds as they returned to roost. One team counted the flocks of buntings that flew in to roost whereas the second team counted the birds present in the roost (in tall grass, reeds and sedges). We separately used a camera to collect photographs (Figs 3 & 4) to verify our identifications and numbers of birds present in the flocks of buntings. We then carried out monthly checks of this roost area to better understand the movement of birds within the landscape and determine if the buntings changed their roosting sites, as well as to check for disturbance or hunting activity. Additionally, we also checked similar areas of grass and scrub and areas near the BPL ranger station, although none contained any buntings.

Yellow-breasted buntings have been regularly observed by the rangers and monitoring team members since November 2021 through point surveys at the site where the species was seen the previous winter. While conducting the crane census, the first record of a roosting group involved 20 individuals on 30 December 2020, and the species was sporadically observed on a few more occasions. Subsequently, we monitored the roosting site once each week to see if there were changes in the number of buntings using it, and to assess the quality of the roosting habitat. We found that the counts of roosting buntings increased daily during the first quarter of 2021, reached a maximum count of ca. 2,780 individuals on 21 March 2021 (Table 1) and declined thereafter. Towards the end of April 2021, only one to four individuals were recorded during incidental visits to the roost, and no further visits were made to check the site.

We consistently detected yellow-breasted buntings in the BPL from December 2020 to April 2021 but did not

Table 1 Estimated counts of yellow-breasted buntings in Boeung Prek Lapouv Protected Landscape based on monthly visits from 30 December 2020 to 29 April 2021.

Date	Counter Location	Estimated Count	Habitat Type	No. of Counters
30 December 2020	Canal 86	20	Roosting (Tall grass)	3
30 January 2021	Canal 86	500	Roosting (Tall grass)	3
31 January 2021	Canal 86 / 03	4	Roosting (Tall grass)	2
05 February 2021	Canal 87 / 03	800	Roosting (Tall grass)	2
05 March 2021	Canal 86	1,200	Roosting (Tall grass)	5
21 March 2021	Canal 86	2,870	Roosting (Tall grass)	4
19 April 2021	Canal 86	100	Roosting (Tall grass)	2
27 April 2021	In front of HQ	4	Sighting (50 m from rice field)	3
29 April 2021	In front of HQ	1	Sighting (50 m from rice field)	2

find any individuals thereafter (Table 1). We are unsure what drives the large increases in buntings from January to March but it could be that birds are displaced from surrounding areas (including areas of farmland) due to disturbance, potentially in combination with birds congregating prior to migration (from March onwards). Our surveys recorded a maximum count of 2,780 individuals in March 2021, the highest count of the species from Cambodia in recent years (higher counts were reported by Goes (2013) from other sites), which possibly involved congregations of birds prior to spring migration. Our findings suggest that BPL is potentially important as a wintering site for yellow-breasted buntings and that it is particularly important as a site where the species aggregates in high densities when the landscape is at its driest during the wintering period. Further surveys should aim to establish the presence of the species more widely within BPL throughout the period when it is present, as well as in adjacent areas of farmland, to better understand its wintering ecology and spatial requirements.

The Palaearctic-breeding yellow-breasted bunting is known to use various stopover sites in eastern China and the Yangtze Valley before continuing on its migration to wintering sites in southern China and Southeast Asia (Heim *et al*., 2020; BirdLife International, 2021). There is limited documentation for the species in Cambodia, although high counts of several thousand individuals were reported at Krous Krom by Goes (2013) and survey work targeting the species since 2012 has been conducted by agencies such as the Ministry of Environment's Department of Freshwater and Wetland Conservation (Ministry of Environment, unpubl. data, 2019). Hence, our results provide insights that contribute to a better understanding of the status, distribution and wintering ecology of the species in Cambodia.

As one of few remaining areas of relatively undisturbed, seasonally inundated grasslands in the Lower Mekong floodplain in Cambodia, BPL has high priority for biodiversity conservation, especially for bird species dependent on grasslands, reedbeds and associated wetland vegetation, even though much of its landscapes remain little surveyed for wintering passerines. The wetlands also support the livelihoods of local communities through their diverse ecosystem services (Van Zalinge *et al*., 2013). For instance, BPL yields wetland resources such as fish, edible plants, firewood, grass (for grazing) and water that support 19 village communities in and around the protected landscape and are estimated to be worth a total net value of USD 2,168,019 per year (Ly *et al*., 2017). There is a need for further work to better assess the diversity of migratory bird communities in BPL, especially wintering passerines (e.g., reed warblers, grasshopper warblers, chats) which are poorly studied in mainland Southeast Asia (e.g. Yamaura *et al*., 2017), and to better understand the importance of the wetlands for species associated with open country such as the yellow-breasted buntings, so as to guide their management.

Our study provides the first baseline information on the status of the yellow-breasted bunting in the BPL. The next step for our work on the species is to conduct regular counts in the winter months of 2022–2023 to monitor population trends, find new roosts elsewhere in BPL, and better assess the size of the wintering population in the landscape. Protecting the core habitat of the buntings from disturbance and fires (i.e. stands of *Saccharum spontaneum* and the reed *Phragmites vallatoria*) and maintaining areas of adjacent scrubby, dry paddy

fields that are not intensively cropped is important and should be considered in the future management of the landscape for this and other wintering passerine species such as warblers, wagtails and chats.

There is limited information on the wintering ecology of yellow-breasted buntings in Cambodia, with very few records since 2002 (Goes, 2013; BICP, 2019). Most records from Southeast Asia stem from incidental observations. Counts at sites with large aggregations in Thailand, at Nong Pla Lai and Bueng Kalo for example, as well as in Vietnam (Nguyen, unpubl. data, 2022; North Thailand Birding, 2020) typically do not exceed several hundred individuals. Our maximum count of 2,780 individuals in March 2021 is the highest count of the species in this poorly-surveyed site to date and suggests how little the species is known in Cambodia. Our observations show that the wetlands of BPL may form an important aggregation (and major wintering) site for yellow-breasted buntings late in the dry season prior to their northbound migrations, and may represent one of the largest known congregations of the species in mainland Southeast Asia at present. Conservation of the habitats used by the buntings will require efforts to better manage the remaining areas of floodplain wetlands, alongside efforts to scale-up law enforcement, whilst working with local farmers to promote sustainable agriculture practices.

Acknowledgements

The authors are very grateful to Will Duckworth and Yu Yat-tung for helping to improve our manuscript. We also thank Nguyen Quang Hao and Ashwin Viswanathan for recent information on the species from Vietnam and India, and are indebted to Lim Varth (vice-director of BPL) and other members of the survey team including the rangers and monitoring team in BPL for supporting our work.

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