

Forest birds as diversity indicator in suburban and residential areas

Forest birds as
diversity
indicator

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Abstract

Purpose – Birds are biological indicators for environment health in which their sightings and abundance could reflect a certain situation or become evaluation tool for co-existence of another species. Here, the study aims to observe urban settlements with substantial forestation, may it be artificial or natural, and the occurrence of bird assemblage across time. Considering the foraging activity of birds hardcoded with sustainability, their spatial overlap resultant into service provision, which can mean, baseline occurrence or an expected encounter equates to support system for ecological vigour.

Design/methodology/approach – From this, birds could indicate external environment vulnerability related to climatic fluctuations, whereby documentation of their arrival across spatial-temporal regimes allowed us to understand their distribution between residential and forested areas.

Findings – Though urban birds are abundant and viewed less important for conservation, the existence of certain species such as long-tailed shrike and little green pigeon disclose the types of food they consume and, the other types of birds attracted to their prey. With regard, the sightings of these birds would mean an encounter with 20 or more other species at a bird watching occasion, though it is limited to the sightings of urban birds.

Originality/value – Subject to criteria for green space, attaining plenty of bird species provides understanding of food availability, the support services and opportunity for urban birds to thrive in midst the opportunity for resources such as food, perching grounds and sufficient numbers of counterparts to reproduce into healthy urban bird populations.

Keywords Urban, Invasion, Sustainable, Season, Malaysia, Ecology

Paper type Research paper

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Birds are the vital components of ecosystem that function by provision, regulation, culture, nurture and support services (Barros *et al.*, 2019). Birds also play an important role to maintain ecological vigour of the tropical ecosystem biome. Their services and functions are consistent with sustainable development goal (SDG) 15 (life on land). Under this direction, birds have their genetics hardcoded to protect, restore and promote sustainable use of the tropical ecosystems and to sustainably manage the forests. However, humans have this compliance to reach an outcome by 2030 (Opoku, 2019) and this, implicates the function of environmental components because spatial overlap triggers natural selection. Importantly, avian studies are focused on primary and secondary forests because of thrill, enthusiasm, endeavour and inquiry, but are limited to areas with accessibility (Nelson *et al.*, 2018; David *et al.*, 2019; Faiznur *et al.*, 2019; Omar *et al.*, 2019a). Moreover, data from these studies are very important because it provides baseline information on the existence and types of birds one would expect within the region of coverage. Advantageous, baseline data reveals about seasonal trends that disclose the types of birds encountered and the microclimate relationships. Considering data recording vital, researchers are challenged by period of bird flyby, roosting area and funding opportunities. Strategies are needed to maximize data capture so that accurate information is documented and it would become beneficial to later works. In this case, data keeping these days has taken new heights whereby residents become part of projects and contribute their experience and knowledge to assist scientists make correct documentation on biological components (Horns *et al.*, 2018; Fink *et al.*, 2018; Omar *et al.*, 2019b; Zauki *et al.*, 2019a, 2019b). These efforts narrowed down information gaps that overlap between forested and residential areas. Hence, findings from studies that recorded forest birds in residential areas (Aida *et al.*, 2016; Mohd-Taib *et al.*, 2016; Yahya *et al.*, 2016; Jasmani *et al.*, 2017; Puan *et al.*, 2019) are clearly understood because most of these birds seek urban jungles for shelter, resource, sustenance and flourish. While the aforementioned studies are limited to West Peninsular Malaysia, knowledge gaps remain for avian diversity on the Eastern region and overlap studies are asserts needed for exploring. In the absence of studies that overlapped findings in suburban and residential areas in Terengganu, one should consider understanding avian biology before summing up findings on adaptation (succession and specialization). Availability or urban landscapes offer crevices and nooks but, instead of wood and roughages, the jungles are appearing with uniform structures that have different scent, altering microclimate conditions, emitting harmful gases and appearing with different hygiene settings. In this case, birds that intrude urban landscapes would become available in these modified ecosystems that already have its trophic level balance and, the ecosystem is functioning well. Less is known about bird biology after residing in urban areas because most of these birds are successful invaders who have adapted themselves with the noise, impoverished air conditions and land pollution. Differently, the present approach discusses on indicator species that were once dwelling in forests but have now made their appearance in converted-land areas (such as residential with parks and wetlands). Classified as urban birds, these avian species give rise to notable presence in predominant human-occupied areas.

Common urban birds are not limited to but, exclusively are large-billed crow (*Corvus macrorhynchos*), Asian glossy starling (*Aplonis panayensis*), Javan myna (*Acridotheres javanicus*), common myna (*Acridotheres tristis*), rock dove (*Columba livia*), zebra dove (*Geopelia striata*), Eurasian tree sparrow (*Passer montanus*) and spotted dove (*Spilopelia chinensis*). When urban areas have wetlands, one would expect to see little egret (*Egretta garzetta*), cattle egret (*Bubulcus ibis*) and black-

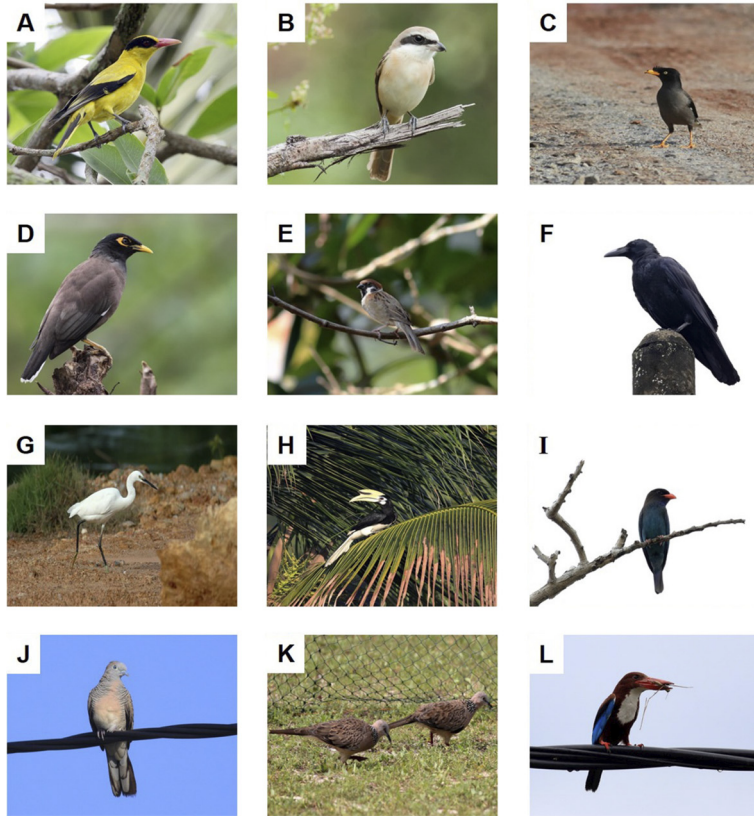
crowned night heron (*Nycticorax nycticorax*). In peculiar manner, some birds such as black-napped oriole (*Oriolus chinensis*), white-throated kingfisher (*Halcyon smyrnensis*) and oriental magpie robin (*Copsychus saularis*) opt to be residents in areas with dwellings, especially at areas with grasshoppers, locusts and crickets. Given two example studies that observe urban birds in residential areas, these two sites are 406 km apart, separated by the Titiwangsa Range and undergo opposite weather trends during northeast and southwest monsoon season in Peninsular Malaysia. However, both areas share one common resemblance, the occurrence of forest birds such as long-tailed shrike (*Lanius schach*) and little green pigeon (*Theron olax*) (Plate 1). These birds do not occur year-long in residential areas but encroach between August and October annually in Kuala Nerus, Terengganu and between June and September in Ipoh, Perak. Should their occurrence depict weather transition where air temperature is arid and dry, both species prey on volant service providers such as bees, butterflies, moths, dragon flies and locusts. In the forest, the sightings of either *L. schach* or *T. olax* indicates flowering season, where one would expect to encounter more than 20 bird species that also includes little spiderhunter (*Arachnothera longirostra*), brown shrike (*Lanius cristatus*), yellow-bellied sunbird (*Cinnyris jugularis*), scaly-breasted munia (*Lonchura punctulata*), paddyfield pipit (*Anthus rufulus*) and hornbills such as rhinoceros (*Buceros rhinoceros*), oriental pied (*Anthracoceros albirostris*), white-crowned (*Berenicornis comatus*) and black (*Anthracoceros malayanus*). Comparatively, the sightings either or both, *L. schach* and *T. olax* in residential areas would indicate an average occurrence of 15 bird species (Plate 2).

These are evidence after 155 h observation time over the span of three months in Kuala Nerus, Terengganu and 82 h observation time over 16 months in Ipoh, Perak between years 2018 and 2019. By far, opportunistic encounter with either, *L. schach* or *T. olax* has revealed the sightings of sunda pygmy woodpecker (*Dendrocopos moluccensis*), oriental dollarbird (*Eurystomus orientalis*), olive-winged bulbul (*Pycnonotus plumosus*) and crimson-breasted flowerpecker (*Prionochilus percussus*), all of which are forest birds that have made their presence in residential areas. It remains unknown for factors that have attracted forest birds into urban landscapes



Notes: (A) *Lanius schach*; (B) *theron olax* discovered 406 km apart in residential areas of Ipoh and Kuala Neru

Plate 1.
Indicator species



Notes: These plates contain birds that occur with the sightings of either of both, *Lanius schach* and *Theron olax*. As such, the label A = black-napped oriole (*Oriolus chinensis*), B* = brown shrike (*Lanius cristatus*), C = Javan myna (*Acridotheres javanicus*), D = common myna (*Acridotheres tristis*), E = Eurasian tree sparrow (*Passer montanus*), F = large-billed crow (*Corvus macrorhynchos*), G** = little egret (*Egretta garzetta*), H* = oriental pied hornbill (*Anthracoceros albirostris*), I* = oriental dollarbird (*Eurystomus orientalis*), J = zebra dove (*Geopelia striata*), K = spotted dove (*Spilopelia chinensis*) and L = white-throated kingfisher (*Halcyon smyrnensis*). Birds indicated with * are forest species, but have made appearance in residential areas, whereas ** represents birds that occur in wetlands

Plate 2.
Urban birds
discoverable in Ipoh
(Perak) and Kuala
Nerus (Terengganu)

but we are sure, continuous observations of these birds are indicating the reduction of forest size that drives biodiversity out of their home range. Perhaps, the Perak and Terengganu State Governments should consider urban planning to include forest patches so that natural habitat of forest birds is maintained and becomes attraction for leisure and recreational endeavours. At present, the residential areas of Taman

Ipoh, Taman Canning and Jelapang in Ipoh, Perak and, suburban landscapes around Gong Badak, Gong Pak Jin, Wakaf Pak Tuyu and Wakaf Tengah as well as Universiti Malaysia Terengganu and Universiti Sultan Zainal Abidin territory in Kuala Nerus, Terengganu fit the criteria for green urban city. However, efforts should be increased to moderate land conversion while reserving some sections for wildlife biodiversity to thrive. Efforts like this do not limit wildlife diversity and function towards the heed for SDGs but instead, construct universal heed to commit with the environment towards the global United Nations Development Programme, blueprinted as Agenda 2030.

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