Mangrove Germplasm Heritage of
Bagan Datuk Publication No. 2



Coastal Mangrove Birds of Bagan Datuk, Perak

Yayasan Kemanusiaan Muslim Aid MALAYSIA serving humanity

MANGROVE GERMPLASMA BAGAN DATUK



Lesser-Adjutant©Koay Zhong Ying

Coastal Mangrove Birds of Bagan Datuk, Perak



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First Edition
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Foreword

Since becoming a new District, Bagan Datuk's quiet landscape will soon transform into a bustling urban area. In this regard, FRIM in cooperation with Muslim Aid Malaysia (YKMAM) is pleased to embark on a conservation project titled Mangrove Germplasm Heritage of Bagan Datuk. It is our hope that the project will enhance the conservation of mangroves and increase the appreciation of the general public towards this intriguing ecosystem. Several studies on the flora and fauna of the Bagan Datuk mangroves have been conducted under this project including the study of birds. The mangroves provide foraging, resting, roosting and breeding sites to a variety of wildlife, in particular birds. Birds and other mangrove wildlife play an important role in the food web and the mangrove ecosystem. In 2008, the Malaysian Nature Society (MNS) recorded 116 bird species, of which 11 are globally threatened. A single-day count in November 2018 recorded nearly 7,000 migratory waterbirds. This highlighted the importance of Bagan Datuk as a crucial high tide roost site for the migratory waterbirds along the East Asian-Australasian Flyway. The diversity and richness of birds found in Bagan Datuk can be a good indicator of a healthy mangrove ecosystem, and a reason for conserving the remnant coastal mangroves. Birds are easily seen and heard which makes it easy for monitoring. This handbook will be a good guide for the local government, local communities, researchers, visitors and bird-watchers. On behalf of FRIM, we would like to take this opportunity to thank the MNS Perak Branch for making this book possible. We look forward to more joint projects and publications.

Treasure the Mangroves



Datuk Dr Abdul Latif B. Mohmod
Director General
Forest Research Institute Malaysia(FRIM)

Foreword



Birds play an important role in coastal mangroves and mudflats by enriching the wetlands with their droppings to enhance the production of stems, leaves and fruits. This, in turn, provides food sources for the herbivores and the predators. Migratory birds from the far north arrive annually to control the population of the coastal marine life. Apart from performing their ecosystem services, birds are enjoyed by birdwatchers and communities for their appearance, songs and behaviour. The Malaysian Nature Society (MNS) support the establishment of The Mangrove Germplasm Heritage of Bagan Datuk by The Forest Research Institute Malaysia (FRIM) for preservation of mangrove heritage. These birds and other wildlife and vegetation preserved in the centre will be educational to youths in the understanding of a coastal mangrove ecosystem. The Centre will be a tourist attraction in Bagan Datuk. During the project's implementation, MNS had set up a local community group called the Beting Nature Society (BNS) that will function as nature guides for the Centre and the surrounding mangroves. Every January, this group will conduct the Asian Waterbird Census (Malaysia) with MNS to monitor the waterbirds and wetland, contributing to the world database. BNS will play an important role in education and conservation. We hope that FRIM will nurture BNS and the Bagan Datuk communities in conserving and protecting the biodiversity in the area. MNS looks forward to working closer with FRIM in the future on biodiversity conservation projects. Lastly, congratulations to the MNS Perak Branch members for carrying out this valuable study on coastal mangrove birds which hopefully will lead to their conservation for the benefit of Bagan Datuk's community, the nation and the global mangrove ecosystem.

In Harmony with Nature



Prof Dr Ahmad Ismail
President
Malaysian Nature Society

Acknowledgements



Malaysian Nature Society
In memory of Late Mr Ooi Beng Yean

The bird survey project was led by late Mr Ooi Beng Yean who was then also the MNS Perak branch chairman. Despite his physical condition, he was kind enough to take up the task of the project team leader and diligently participated in every field trip and more. His knowledge, dedication and wisdom were key factors for the success of the survey.

We would like to thank Dave Bakewell for helping to plan and lead the boat survey to Bagan Datuk in Nov 2018. Without his knowledge and skills in identification of migratory birds, we would not have been able to confirm identify of some of the difficult species recorded. We would also like to thank all those who had helped in the survey in one way or another. Terence Ang had shared his sighting of the Chinese Egret at the jetty. Other MNS Perak members also provided support or participated in some of the field trips although not on a regular basis.We would also like to thank FRIM for their support in enabling the publication of this book.

Chan Kai Soon and Tou Jing Yi
MNS Perak Branch

Acronym and Abbreviation

AWC	Asian Waterbird Census
BNS	Beting Nature Society
EAAF	East Asian-Australasian Flyway
EAAFP	East Asian-Australasian Flyway Partnership
FRIM	Forest Research Institute Malaysia
GIS	Geographic Information System
IBA	Important Bird and Biodiversity Areas
IUCN	International Union for Conservation of Nature
IWC	International Waterbird Census
MNS	Malaysian Nature Society
NCSC	North-central Selangor Coast

Glossary

Anthropogenic of, relating to, or resulting from the influence of human beings on nature.

Avifauna the birds of a particular region, habitat, or geological period.

Breeding colonies large congregation of individuals of one or more species of nesting bird that in proximity at a particular location.

Carnivorous of an animal feeding on other animals.

Coastal hydrology science dealing with the properties, distribution, and circulation of water in coastal habitat.

Ex-situ conservation conservation means that actions are taking place that involve removing the species from its natural setting.

Guano excrements of seabirds and bats.

Intertidal denoting the area of a seashore which is covered at high tide and uncovered at low tide.

Insectivorous of an animal feeding on insects, worms, and other invertebrates.

Mangrove zonation orderly distribution of mangrove species caused by intertidal environment.

Nectarivore of an animal that principally eats nectar.

Passerine of or relating to the largest order (Passeriformes) of birds which includes over half of all living birds and consists chiefly of songbirds with perching habits

Pollinator agent that carries pollen from one plants to another.

Roosting site a place where winged animals, especially birds or bats, rest or sleep.

Shorebirds of or relating to an order (Charadriiformes) of birds (such as a plover or sandpiper) that frequent the seashore

Species composition identity of all the different species that make up a community.

Staging site sites along the migration corridors where birds stops to feed en route.

Wintering site habitat where an animal that migrates spends the part of the year when it is not breeding and raising young.



Greater Flameback©Koay Zhong Ying

1. Introduction



In Malaysia, there are a total of 785 species of birds recorded (MNS Bird Conservation Council, 2015) and 125 species of birds can be found in the mangrove forest (Nisbet, 1968; Wells, 1999). The importance of mangrove to avifauna has been discussed extensively in many previous literature and nonetheless, little studies have been conducted in Malaysia since 1968 (Nisbet, 1968; Noske, 1995). Apart from providing primary habitats for many specialized terrestrial fauna, mangroves are home and refuges for resident and migratory birds. Owing to its unique location between the intertidal and terrestrial habitats, mangroves serve as corridors for bird movement and as roosting or breeding sites of many bird species by increasing the connectivity between different habitats (Shaeves, 2009).



1.1 Importance of mangroves to birds

The Indo-Malaysian region has the highest diversity of mangrove plant species, with up to 48 species recorded in Malaysia of which 40 are true mangroves (Hamdan et al., 2012). Mangrove species are typically arranged in zone parallel to the shores which the zonation of mangroves are primarily determined by coastal hydrology (Hamdan et al., 2012).

Mangroves are known to support several species of resident and migrant land-birds (Nisbet, 1968). The main determinant of avian species assembly pattern in mangrove is prey availability which is driven by mangrove zonation, surrounding habitat of mangroves and season (Mohd-Azlan, Noske & Lawes, 2012). Harsh intertidal conditions of mangrove forests provide shelter for mangrove birds from land-bound predators. Some passerine migrants use mangrove as roosting and foraging habitats (Shaeves, 2009).

For instance, Noske (1995) found that the Mangrove Blue-Flycatcher (*Cyornis rufigastra*) prefers dense vegetation with low light such as *Bruguiera parviflora* (Lenggadai) and *Bruguiera cylindrica* (Berus) zones in Kuala Selangor. Besides mangrove zonation, the avian species composition is affected by the timing of mangrove flowering. This was discussed by Noske back in 1995 which the presence of Copper-throated Sunbirds was observed during the flowering of *Bruguiera* sp. and found foraging in adjacent lowland habitat outside flowering season.

Bruguiera sp. and *Sonneratia* sp. are known to produce nectar and attract nectivorous birds during their flowering season (Mohd-Azlan et al., 2012; Noske, 1995). In the study by Noske (1995), sunbirds were speculated to be an important pollinator of *Bruguiera* spp. based on his observations of three flowering *Bruguiera* sp. that were frequented by mostly sunbirds. Besides *Bruguiera* sp., sunbirds and bulbuls are known as pollinators of *Sonneratia* sp. as well (Coupland, Paling & Mcuinness, 2006; Noske, 1995).

Nectar is not the only attraction for mangrove birds. When mangroves flower, insect abundance spikes and providing food for the insectivorous birds (Mohd-Azlan et al., 2012). In return, mangrove birds help to control the insect populations which otherwise would become pest and reduce the ability of mangrove forest to survive (Alongi, 2002).

1.2 Uniqueness of waterbirds

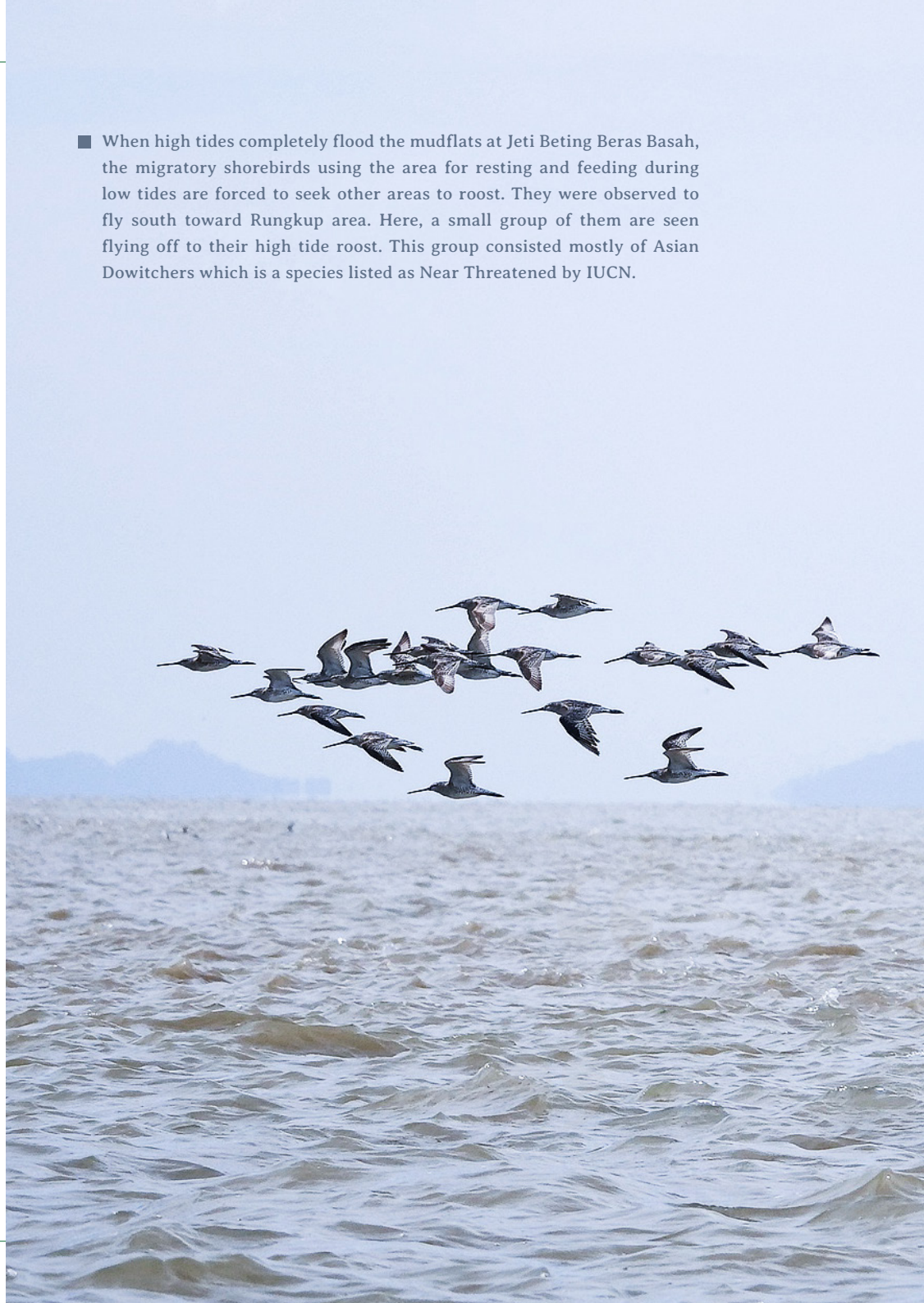
Mangroves possess a unique interface between terrestrial and intertidal foraging habitat. Besides carnivorous bird such as kingfishers, a variety of shorebirds, herons, egrets and storks are known to utilize the coastal habitat. High quality wintering ground is important for the survival of migrants and their reproductive success in breeding ground (Ghasemi et al., 2012).

Accessibility is one of the main determinant for wintering birds to select suitable roosting site (Zharikov & Milton, 2009). Mangroves are much preferred by wintering shorebirds, herons, egrets and storks because of its strategic location that allows easy access to adjacent tidal mudflat as their foraging site during low tide (Zou et al., 2006). Even though roosting shorebirds are capable to travel up to 20 km daily in search of food (Green & Sanchez, 2006), the mangroves remain preferential because they provide a shorter distance between roost and foraging site and allows the birds to reserve their energy for travelling.

Besides being a prime roosting habitat, mangroves also provide a habitat for breeding colonies of wading birds. Studies showed that breeding colonies of wading birds such as egrets on mangrove trees are contributing significant amount of inorganic nitrogen for *Rhizophora* sp. (Onuf, Teal & Valiela, 1977). Enhanced growth with higher number of leaves, flowers, lateral branches and increment in stem size are observed on mangrove tree (*Rhizophora* sp.) nourished by guano of breeding bird colonies (Onuf et al., 1977).

The arrival of migratory waterbirds change the species composition seasonally (Acevedo, 2008). The influx of high numbers of migrant to resident waterbird community is very likely to increase the nutrient concentration in mangrove forests (Josens, Haydee & Favero, 2009). In which leads to further speculation on the roles of migratory waterbirds in facilitating biological connectivity via nutrient translocation at regional and inter-continental scale as they migrate from breeding grounds to wintering sites (Shaeves, 2009).

When high tides completely flood the mudflats at Jeti Beting Beras Basah, the migratory shorebirds using the area for resting and feeding during low tides are forced to seek other areas to roost. They were observed to fly south toward Rungkup area. Here, a small group of them are seen flying off to their high tide roost. This group consisted mostly of Asian Dowitchers which is a species listed as Near Threatened by IUCN.



2.
About The Mangrove Germplasm Heritage of Bagan Datuk

The mangrove forests in Peninsular Malaysia were impacted by the 2004 tsunami caused by the Indian Ocean Earthquake. Amidst recovering from the adverse impact caused by natural disasters, our mangroves continue to be threatened by urban development, land conversion to aquaculture and exploitation for mangrove pole harvesting (Alongi, 2002; Noske, 1995).

Mangrove habitat degradation is known to have adverse impacts on bird populations (Wells, 1999; Mohd-Azlan et al., 2012). Even though Peninsular Malaysia is losing their mangrove forest at rate of about 215 ha annually or about 0.19% of the mangroves area from 1990 to 2017 (Hamdan & Muhamad Afizzul, 2020), there is an urgent need to assess remaining biodiversity in our mangrove forests and develop conservation measures. Since much of the loss is occurring in stateland forests, it would be opportune if the remaining stateland forests are converted into Permanent Reserved Forests.

The Mangrove Germplasm Heritage of Bagan Datuk, a narrow strip of mangrove forest stretch at the southern bank of the Sungai Perak river mouth, is known to be a roosting and feeding ground for wintering waterbirds. This mangrove forest patch is surrounded by anthropogenic activities. Its southern border is delineated by a canal of an oil palm plantation while the eastern border is marked by a fishermen's jetty that is under construction. On its western border, the Beting Beras Basah jetty is located. Figure 1 shows the location of the Mangrove Germplasm Heritage of Bagan Datuk.

Germplasm is the living tissue from plants containing hereditary message that dictates the development of plants. In order to preserve the biological information of our disappearing mangrove, the Forest Research Institute Malaysia (FRIM) established The Mangrove Germplasm Heritage of Bagan Datuk with support from Yayasan Kemanusiaan Muslim Aid Malaysia (Muslim Aid) and Malaysian Nature Society (MNS). Recognizing the urgent need to preserve our mangrove forest, a mangrove research and information center has been established in Bagan Datuk for ex-situ conservation. A mangrove germplasm nursery is included in the center for preservation and research of regional mangrove species. Besides germplasm research in the centre, this project included four other research components ranging from Geographic Information System (GIS) Mapping, socio-economy survey of local community to flora and fauna surveys.

In 2018, MNS worked together with FRIM to conduct a survey of bird communities in mangrove forest under this Project. The bird survey was conducted from March until November 2018 and an inventory for coastal mangroves' resident and migratory birds was prepared.

During the nine-month study, the results showed that there was no significant difference between species diversity compared to that of the avian species community from Kuala Selangor Nature Park, a mangrove protected area in the north-central Selangor coast (NCSC). Although the survey period was short, survey results showed that Bagan Datuk is an important site for wintering waterbirds.



Jeti Beting Beras Basah is a suitable location to observe shorebirds during low tides. Large areas of exposed mudflats during low tide provide a suitable condition for migratory birds to rest and feed here.



Tourists regularly visit the exposed sandbars to take photographs due to its 'Sky Mirror' effect caused by reflections of the shallow water. Large numbers of terns and other waders rest along the sandbars and tolerate human disturbance from a safe distance.



Figure 1. Map of the Mangrove Germplasm Heritage of Bagan Datuk (Source: FRIM)

2.1 Species composition of the mangrove bird community in Bagan Datuk

The migrating nature of waterbirds and flexibility of resident mangrove birds to utilize alternative habitats suggests that mangrove birds are important fauna that could potentially provide ecological linkage between mosaic habitats of the coastal ecosystem (Beulow, 2015). Therefore, it is crucial to determine the species composition of mangrove bird community and understand the composition between migratory and resident bird and how they utilize the resources in the mangrove forest.

Over the nine month survey, 116 species from 40 families were recorded. The majority of the birds recorded were resident land birds (33.6%), followed by migratory waterbirds (27.6%) as shown in Figure 2 and Table 1.

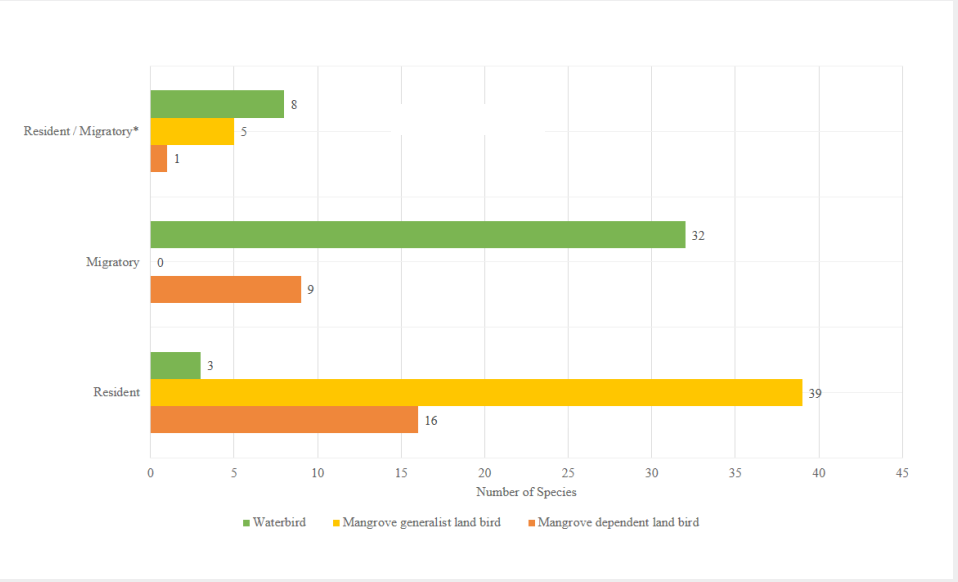


Figure 2. Status of Avifauna

Table 1. Summary of waterbirds in Bagan Datuk with conservation status

Description	Common name	Species name	IUCN Status
Resident	Lesser Adjutant	*Leptoptilos javanicus*	VU
Migratory	Chinese Egret	*Egretta eulophotes*	VU
	Great Knot	*Calidris tenuirostris*	EN
	Normann's Greenshank	*Tringa guttifer*	EN
	Eurasian Curlew	*Numenius arquata*	NT
	Black-tailed Godwit	*Limosa limosa*	NT
	Bar-tailed Godwit	*Limosa lapponica*	NT
	Curlew Sandpiper	*Calidris ferruginea*	NT
	Red-necked Stint	*Calidris ruficollis*	NT
	Asian Dowticher	*Limnodromus semipalmatus*	NT
	White-faced Plover	*Charadrius dealbatus*	DD
Feral	Javan Myna	*Acridotheres javanicus*	VU

The coastal mudflats near Sungai Tiang are sometimes completely submerged in water during high tides. Consequently migratory birds are driven to higher grounds or temporarily roost on trees.

These are Whimbrels resting on the trees. This species is gregarious and has strong tendency to roost in large groups. It is also more likely to roost on the mangrove trees as shown in this image.



3.
Bagan Datuk's Pontential as an Important Bird and Biodiversity Area (IBA)

Important Bird and Biodiversity Areas (IBA) are sites recognized as internationally important for bird conservation. IBAs are one of many practical conservation tools used to identify priority sites for biodiversity conservation by using bird as basis for sites identification (Yeap, Sebastian & Davison, 2007).

IBA sites provides resources and focus for researchers, governments and policy makers for conservation action, planning and advocacy. Even though IBAs are non-governmental and designation has no legal implications but it provides mean of communicating high conservation values of IBA to government and civil society to build concerted efforts for achieving Aichi Biodiversity Targets (Yeap et al., 2007; Waliczky et al., 2018).

To date, there are currently 55 IBAs throughout Malaysia (Figure 3) and 18 out of the 55 IBAs are wetlands supporting globally threatened bird species (Yeap et al., 2007). Nine out of 18 wetland IBAs are coastal mangroves and mudflats with conservation importance for migratory waterbirds.

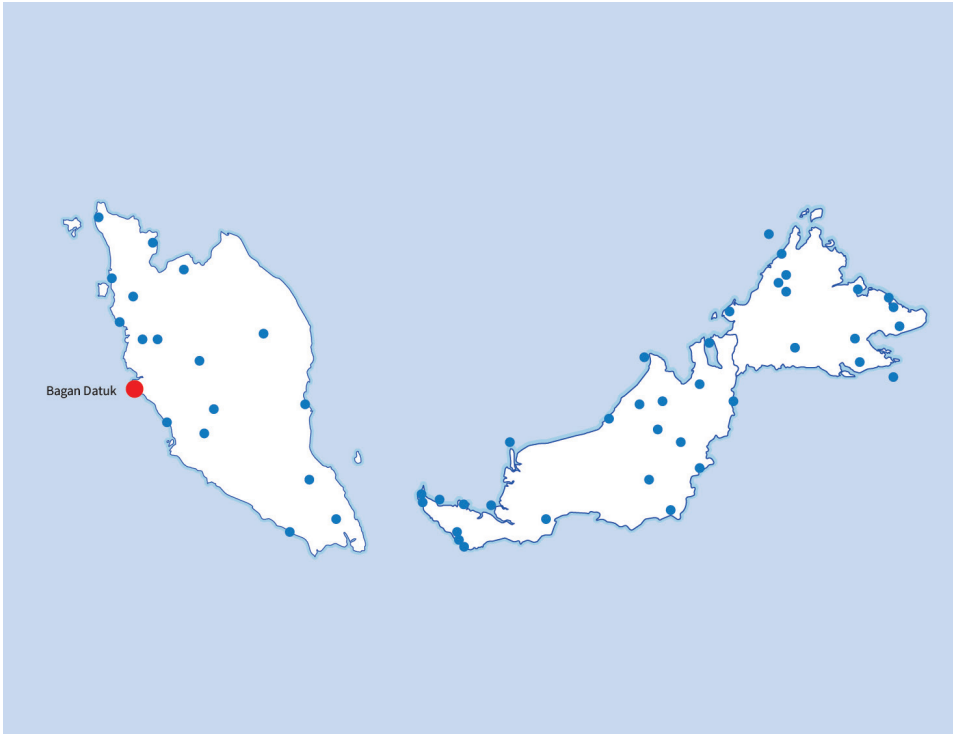


Figure 3. Map of IBAs in Malaysia

3.1 Ornithological importance of Bagan Datuk

Intertidal habitats are crucial to both congregatory migrants and resident waterbids. As most of the mangrove forests are situated on the west coast of Peninsular Malaysia, Bagan Datuk mangrove forest is one of the sanctuary for wintering waterbirds. Results of the avian survey conducted by MNS indicates that the Bagan Datuk mangrove forest could meet the criteria as an IBA with continue efforts on monitoring as shown in Table 2.

Table 2. Summary of IBA criterion and result of surveys

Criterion of IBA	Result of Surveys
Criterion A1. Globally threatened species The site regularly holds significant numbers of globally threatened bird species, or other bird species of global conservation concern	Presence of resident Lesser Adjutants and migratory waterbirds including Great Knot, Normann's Greenshank, and Chinese Egret.
Criterion A3. Biome-restricted assemblages The site is known or thought to hold a significant component of the group of bird species whose distributions are largely confined to one biome.	Present of resident Black-thighed Falconet and Olive-winged Bulbul.
Criterion A4. Congregations The site is known or thought to hold, on a regular basis, ≥ 1 % of the global population of a congregatory waterbird species.	Based on the surveys, Lesser Sand-Plover and Common Redshank was recorded with individuals of more than 1% biogeographic population.

In the bird survey, there is a mixture of 58 resident and 41 migrant species including key residents (Mangrove Blue Flycatcher, Copper-throated Sunbird, Ashy Tailorbird, Laced Woodpecker and Collared Kingfisher) with mangrove forest as preferential sites. The presence of globally threatened Great Knot, Normann's Greenshank and Chinese Egret is crucial indication of Bagan Datuk's importance as IBA. Thus, continue monitoring is needed to ensure these species are recorded on regular basis as to achieve criterion A1.

More than 3,000 waterbirds congregates on the sandbars near Jetty Beting Beras Basah as feeding grounds and roosting sites. The number of congregates waterbirds spike up to 6,000 individuals at roosting site at Rungkup (approximately 3 km away from their feeding ground). Among the waterbird survey, Lesser Sand-Plover and Common Redshank have reached more than 1% of biogeographic population. Other waterbird species with high number of congregations including Greater Sand-Plover, Whimbrel and Terek Sandpiper indicates the potential of Bagan Datuk to be a productive mangrove forest and attract high number of waterbirds congregation.

In the circumstances of Bagan Datuk, it is highly suggested that The Mangrove Germplasm Heritage of Bagan Datuk to be considered as a single IBA with its potential to compliment existing NCSC-IBA. This is because adjacent sites with similar trigger species or bird with similar species communities are recommended to be considered as a single IBA with different components (Donald et al., 2019). Besides, site sustaining similar important trigger species, with broad and undefined range, in this context, waterbirds should be better considered as a single IBA with acknowledgment that there may be unsuitable habitats between the other sites.

4.
Bagan Datuk and the East Asian-Australasian Flyway (EAAF)

To date, there are a total of nine major migration systems of waterbirds identified including East-Asian Australasian Flyway (EAAF) which encompasses up to 22 countries that includes Malaysia as shown in Figure 4.

This flyway system is used by migratory waterbirds to traverse as far as from Russia and Alaska, through East Asia and Southeast Asia, to Australia and New Zealand. EAAF is used annually by up to 50 million waterbirds by 32 globally threatened species.

Flyways encompass the entire area used by waterbird population in its annual cycle, including breeding and non-breeding ground and staging sites used in migration. At the global level, Flyways connect countries together through migratory waterbirds and efforts to conserve them.

Malaysia joined the East Asian-Australasian Flyway Partnership (EAAFP) in 2012 with Bako-Buntal Bay (EAAF112) from Sarawak accepted as its first Flyway Network Site in 2013. Malaysia has several wetland IBAs that qualify as potential Flyway Network Site including the NSCS in Selangor.

Flyway Network provides an opportunity for sites to be included in conservation schemes across the Flyway and ensure the internationally important sites are managed sustainably for the survival of migratory waterbirds. In order to be considered for inclusion in Flyway Site Network, the site has to fulfill the criterion of Ramsar Convention on Wetland for internationally important sites for migratory birds and staging criteria of Asia-Pacific Migratory Wetland Conservation Strategy.

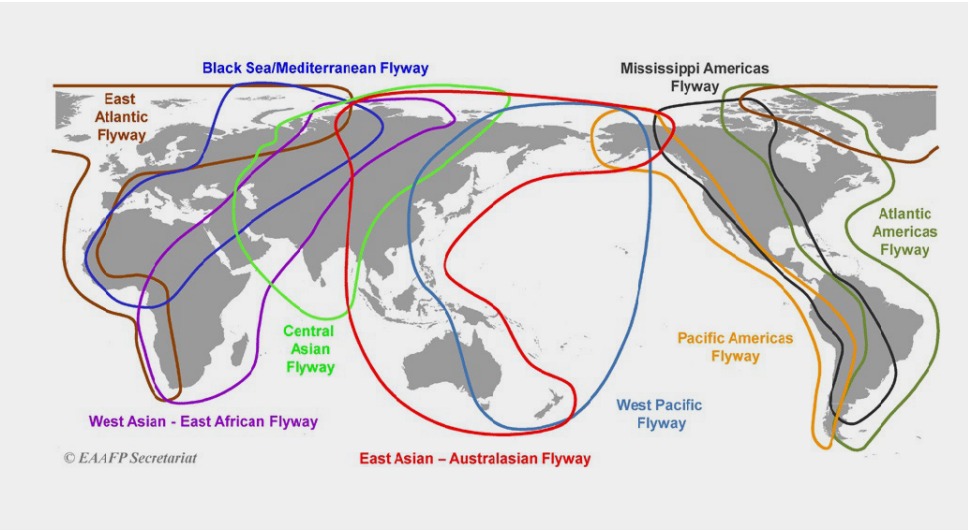


Figure 4. Nine major flyways of waterbirds (source: East Asian – Australasian Flyway Secretariat)

5. Conclusion

Despite being one of the most productive wetlands with ecological function as corridors beween habitats and refugia for many wildlife species, mangroves remains highly threatened (Luther & Greenberg, 2009).

Racing against the rapid declination of mangrove forest, non-governmental organizations including MNS have been working alongside with government for mangrove conservation. Birds survey conducted by MNS showed that The Mangrove Germplasm Heritage of Bagan Datuk qualify as potential IBA. Lack of ecology on activity pattern of avian across mangrove habitats and constant monitoring of changes in avian communities across time remain as major impediment to determine dependency of avifauna on mangrove forest. Nonetheless, with restless conservation efforts, it is believed that understanding on avian community of The Mangrove Germplasm Heritage of Bagan Datuk will be improved and recognized as an important habitat for the survival of birds.



Greater Flameback© Chan Kai Soon

6.
Birds Of Bagan Datuk

Based on the survey of The Mangrove Germplasm Heritage of Bagan Datuk, up to 116 species of bird comprising both migrant and resident birds were recorded. The rich avian diversity in mangrove forest of Bagan Datuk is further illustrated in this chapter with beautiful photographs taken by the team members .Other details on the birds include their local and global conservation status based on IUCN's Red List of Threatened Species 2020, and the estimated size of each species of bird.

This inventory list of birds can be used as a guide for birding in The Mangrove Germplasm Heritage of Bagan Datuk, along with field guides for accurate identification.

Columbidae

Pink-necked Pigeon

Treron vernans, **Punai Kocok, Resident, 25cm**

This is a common widely distributed resident bird of the gardens and parks. Sexually dimorphic, the male has greyish head, pinkish neck and upper breast. Female is similar but the head, neck and breast are yellowish to green. It feeds mainly on fruits and is considered important for dispersal of seeds. Although it is well adapted to a wide range of forest and urban habitats, it had not been seen feeding or nesting in the mangrove forest of Bagan Datuk during the bird survey. Other common birds of the gardens and parks such as Yellow-vented Bulbul, Oriental Magpie Robin, Eurasian Tree Sparrow, Common Tailorbird and Asian Glossy Starlings were seen here but these too do not feed or roost inside the mangrove forest.



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Cuculidae

Horsfield's Bronze-Cuckoo

Chrysococcyx basalis, **Sewah-Daun Australia, Vagrant, 16cm**



© Chan Kai Soon

This migratory species has a white eyebrow and a black-brown eye stripe. The upperparts of body is bronze in colour and the breast is strongly barred. Unlike most migrants which come from the northern hemisphere, it breeds in Australia and migrate to Malaysia as far north as Penang with records of sightings from May to July each year. Like the Little Bronze-Cuckoo, it is a brood parasite.

Cuculidae

Little Bronze-Cuckoo

Chrysococcyx minutillus, **Sewah-Daun Biasa, Resident, 16cm**



© Susan Cheong Suit Kuen

This species has a barred throat, chest and tail like Horsfield's Bronze-Cuckoo but it lacks a black eye stripe. It also differs by having a prominent red eye ring in the males. This is the smallest cuckoo species in the world. Due to its small size and preference for thick vegetation, it is usually heard before being seen. It is a brood parasite and the Golden-bellied Gerygone which is also present in the same locality in Bagan Datuk is a known brood host.

Caprimulgidae

Large-tailed Nightjar

Caprimulgus macrurus, **Tukang Biasa, Resident, 30cm**

This species is brownish grey overall with intricate mottled plumage which makes it well camouflaged when roosting on the ground. It has a dark brown ear patch. The tail is characteristically long with two white spots at both sides of its end. This is a nocturnal bird which is widespread and adapted to human presence. Since it prefers to roost and nest on the ground, it is susceptible to threats from some animals and monitor lizards that may wander into the mangrove forest.



© Koay Zhong Ying

Apodidae

Germain's Swiftle

Aerodramus germani, Layang-Layang Gua Laut, Resident, 12cm

This species is very similar to Edible-nest Swiftlet and is in fact still considered as subspecies of Edible-nest Swiftlet. Distinguishing between them and between other swiftlets is very difficult. Germain's Swiftlet has the lightest underparts among the various swiftlets. The upperparts are blackish-brown. The tail is slightly forked and wings are long and narrow. The rump varies from whitish to greyish depending on subspecies but is generally paler than other swiftlets. Its nest is made of layers of hardened saliva and is one of the swiftlet species commercially farmed in Southeast Asia. Members of the genus Aerodramus are also remarkable for using echolocation to enable them to navigate in the dark such as inside caves.



© Chan Kai Soon

Charadriidae

Pacific Golden-Plover

Pluvialis fulva, **Kerinyut Biasa, Migrant, 25cm**



© Koay Zhong Ying

Non-breeding birds have rather non-descript plumage. Upper parts are brownish with tinge of yellow. A narrow pale white supercilium is visible. Breeding birds show prominent mix of golden yellow and black. It has black face, throat and breast fringed by a narrow white band. This bird illustrated is moulting into breeding plumage. This species tends to gather in large flocks in both freshwater swamps and coastal mudflats. It breeds in the Arctic and Alaska.

Charadriidae

Lesser Sand-Plover

Charadrius mongolus, **Rapang-Sisir Kecil, Migrant, 20cm**



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In breeding and non-breeding plumages, it is difficult to be distinguished from Greater Sand-Plover. Besides being smaller, its structure is more chunky with relatively longer legs, shorter bill, and rounder head. The bill tip is more blunted. Breeding birds have black forehead, white throat rimmed by black and well demarcated from bright orange neck and breast which is duller in females. Bird illustrated is moulting into breeding plumage as evidenced by development of rufous colours. It breeds in the highlands of central Asia and eastern Russia.

Charadriidae

Greater Sand-Plover

Charadrius leschenaultii, **Rapang-Sisir Besar, Migrant, 24cm**

This species is larger than the Lesser Sand-Plover but otherwise hard to be distinguished from it. They are much less common than the Lesser Sand-Plovers. Both species lack a white collar and this helps to distinguish them from other small plovers. The head is more squarish, bill longer and thicker. It breeds in the semi-deserts of Turkey and eastwards through Central Asia.



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Scolopacidae

Eurasian Curlew

Numenius arquata, **Kendi Besar Biasa, Migrant, 58cm**

This is a very large wader with a distinctive very long curved bill and paler plumage than the Whimbrel. Like the Whimbrel, it is also highly gregarious in its wintering grounds. It is distinguished from the Far Eastern Curlew by having a white rump and white underwing. It breeds across temperate Europe and Asia. Due to declining populations, the species is now classified as Near Threatened under IUCN Red List.



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Scolopacidae

Whimbrel

Numenius phaeopus, **Kendi Gajah, Migrant, 43cm**



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Whimbrel can occur in small flocks, it is the smallest of the three common larger decurved bill curlews found in Malaysia. The others being the Eurasian Curlew and Far Eastern Curlew, the later was not recorded in this survey. This gregarious wader has a stronger tendency to roost in mangrove trees during high tide as seen in this image.

Scolopacidae

Black-tailed Godwit

Limosa limosa, **Kedidi-Raja Ekor Hitam, Migrant, 38cm**



© Chan Kai Soon

This is another relatively large and long-billed shorebird like the previous two species. Non-breeding birds have dull grey-brown plumage and unbarred, black tail. The bill is fleshy pink. Its breeding grounds stretch from Iceland through Europe to central Asia. They are less common than Bar-tailed Godwit and are much less likely to be found in inland freshwater habitats.

Scolopacidae

Bar-tailed Godwit

Limosa lapponica, **Kedidi-Raja Ekor Belang, Migrant, 42cm**

This godwit has a long tapering and slightly upcurved bi-coloured bill. Non-breeding plumage is grey-brown but breeding birds have uniform brick-red colour. It differs from Black-tailed Godwit by having black and white stripes at its tail. It breeds on the Arctic coasts and tundra from Scandinavia to Alaska. It winters as far south as Australia and New Zealand. It is noted for its longest known non-stop migration flight of any bird from Alaska to New Zealand.



© Chan Kai Soon

Scolopacidae

Ruddy Turnstone

Arenaria interpres, **Kedidi-Kerikil Merah, Migrant, 23cm**

This small shorebird species from the sandpiper family with a shortish bill that resembles more of the members in the plover family. The plumage has a harlequin-like pattern of black and white. The upper parts are dark grey-brown, changing into reddish-brown in breeding plumage. It feeds on crustaceans, molluscs and worms. It often turns over stones with its bill to get at its prey and hence its name.



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Scolopacidae

Great Knot

Calidris tenuirostris, **Kedidi-Dian Besar, Migrant, 30cm**



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This species has short dark legs and a thin dark bill. The face, throat and breast are heavily spotted black. It resembles the Red Knot in non-breeding plumage but has a longer tapering bill. This species had been uplisted to Endangered by IUCN due to rapid decline in population resulting from reclamation of coastal areas in non-breeding grounds.

Scolopacidae

Curlew Sandpiper

Calidris ferruginea, **Kedidi Paruh Lengkuk, Migrant, 22cm**



© Koay Zhong Ying

This bird in non-breeding plumage has uniform pale grey upper parts and white below, with an obvious supercilium but lacking the bold 'double brow' of the Broad-billed Sandpiper to which it may resemble. Breeding adults have brick-red underparts. It is highly gregarious, often accompanying large flocks of other small waders of similar sizes. Although found in coastal and inland waters, this species had been decreasing in number and is assessed as IUCN Near Threatened in 2016.

Scolopacidae

Red-necked Stint

Calidris ruficollis, **Kedidi-Kerdil Leher Merah, Migrant, 15cm**

This is among the smallest waders. It has fine dark bill with dark legs. It feeds with quicker movements than other similar small waders which is a clue to identification. It is similar to Little Stint which has more pointed bill and longer legs. It is mainly found in coastal areas but would end up in inland wetlands during passage migration as well.



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Scolopacidae

Asian Dowitcher

Limnodromus semipalmatus, **Kedidi-Tetiruk Asia, Migrant, 35cm**

This species has blackish grey upper parts with whitish fringes, pale supercilium, a long bill and snipe-like head. Blackish legs distinguish it from Long-billed Dowitcher. It can also be confused with Bar-tailed Godwit but the bill is uniformly black instead of bi-coloured. It breeds in Mongolia and Russia and is vulnerable to habitat loss in these areas.



© Susan Cheong Suit Kuen

Scolopacidae

Terek Sandpiper

Xenus cinereus, **Kedidi Sereng, Migrant, 23cm**



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This species has a distinctive long upcurved bill and short bright orange legs. It has grey upperparts and white underparts. It feeds in a distinctive way, running rapidly after insects and other preys. It breeds in Finland and Siberia and migrate as far south as Australia.

Scolopacidae

Common Sandpiper

Actitis hypoleucos, **Kedidi-Kelicap Biasa, Resident & Migrant, 20cm**



© Koay Zhong Ying

This species has greyish-brown upperparts and white underparts. A white spur at the shoulder is an important distinguishing feature from Green Sandpiper. It is very common and widespread in coastal and inland waters. It shows characteristic bobbing of its tail like wagtails, and thrusting head movements. It forages by sight and preys include insects, crustaceans and invertebrates. Although it is common, it is rather solitary in its wintering ground where it keeps its distance with another bird of its own species, unlike other gregarious waders. It breeds across temperate and subtropical Europe and Asia, and migrates as far south as Australia.

Scolopacidae

Common Greenshank

Tringa nebularia, **Kedidi Kaki Hijau Biasa, Migrant, 35cm**

This species has overall greyish plumage with white belly and greenish legs, found in coastal as well as freshwater habitat. Usually solitary and it could be difficult to be distinguished from the Nordmann's Greenshank in coastal areas. However, it has longer tibia and usually has a darker plumage. It breeds across northern Europe and Asia, and migrates to Africa, southern Asia and Australia.



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Scolopacidae

Nordmann's Greenshank

Tringa guttifer, **Kedidi Kaki Hijau Berbintik, Migrant, 32cm**

This endangered species resembles the Common Greenshank. Its structure differs by having shorter yellow legs and thicker bill which is often more strongly bi-coloured. It usually appears overall paler than Common Greenshanks. Breeding birds have densely spotted breast and upper sides. It breeds in eastern Russia and the Sakhalin Islands. Its habitat is coastal marshes and is not found inland in its wintering grounds. It has a worldwide population of only 600 to 1300 individuals with a decreasing trend due to development of coastal wetlands throughout its range. This image shows one bird (largest bird in image) roosting with a group of sand-plovers and Terek Sandpiper.



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Scolopacidae

Common Redshank

Tringa totanus, **Kedidi Kaki Merah Biasa, Migrant, 8cm**



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This species has greyish-brown upperparts and whitish underparts, with bright red legs and black-tipped red bill. In breeding plumage, its upperparts are strongly marbled in appearance with black spots. This is a widespread species and the Malaysian subspecies breeds in southern Siberia, Mongolia and east Asia. They are mainly coastal birds. They are wary and noisy birds which often alert other birds to disperse when a mixed flock of birds is startled.

Laridae

Little Tern

Sternula albifrons, **Camar Kecil Biasa, Resident & Migrant, 23cm**



© Koay Zhong Ying

Wintering bird can be identified by its small size. It has a thin sharp bill, a black cap with whitish forehead. The bill is black in wintering bird and turn yellow with black tip in breeding plumage. It has a black stripe extending from shoulder to the wingtip. This species occurs mainly in the coastal areas but is also known in inland freshwater habitat. It is known to be breeding in Malaysia and Singapore.

Laridae

White-winged Tern

Chlidonias leucopterus, **Camar Tasik Sayap Putih, Migrant, 23cm**

This species has a short an stubby bill, white wing, and black marking earmuffs (resembling earphone) in winter plumage. Breeding plumage is very distinctive, black body and head contrasting with white wing and shoulder, as shown in this picture. It feeds by picking up fishes and insects from the water surface rather than diving down into the water.



© Koay Zhong Ying

Laridae

Whiskered Tern

Chlidonias hybrida, **Camar Tasik Bermisai Biasa, Migrant, 26cm**

Non-breeding individuals could be similar to White-winged Tern but has a faded, patchy dark crown and narrow black streak behind eye instead of earmuffs. It has a rather stout bill and square tail. It also feeds by picking up prey from the water surface. It is more often found in coastal habitat and inland wetlands, like marsh, paddy fields, lakes, lagoons and river mouth.



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Laridae

Common Tern

Sterna hirundo, **Camar Siput, Migrant, 35cm**



© Late Ooi Beng Yean

The subspecies in this image has an all black bill, red-brown legs and dark greyish above, whitish below, black cap with white forehead. The long deeply forked tail is an important field mark to distinguish this species with other common terns species in coastal areas. It breeds in Europe, Asia and North America.

Laridae

Great Crested Tern

Thalasseus bergi, **Camar Berjambul Besar, Migrant, 46cm**



© Koay Zhong Ying

This is a very large tern. This species has grey upperparts, white underparts, a long lemon-yellow bill and a shaggy black crest. It feeds by plunge diving for fish but is also adaptable by following fishing boats to pick up discards from these boats. It will roost on open shores, boats and pilings at harbour as in this image. The subspecies in Malaysia breeds in eastern Indian Ocean, Australia and western Pacific Ocean.

Laridae

Lesser Crested Tern

Thalasseus bengalensis, **Camar Berjambul Kecil, Migrant, 40cm**

This species has white forehead and grey rump. Its bill is orange versus the yellow bill of Great Crested Tern which it resembles and it is also slender. Like the Greater Crested Tern, it is also strictly coastal in distribution. It breeds along the coasts of the Mediterranean and Red sea through Indian Ocean to Australia.



© Koay Zhong Ying

Laridae

Lesser Adjutant

Leptoptilos javanicus, **Burung-Botak Kecil, Resident, 114cm**

This resident species is occasionally seen thermalling over the coastline of Bagan Datuk, sometimes descending onto the mudflats to join other migrant waterbirds feeding. However, it also often feeds in inland freshwater swamps and paddy fields. Its diet consists of molluscs, fishes and frogs etc but it had also been observed to take dead rats in the paddy fields. In captivity, this species had been known to hybridize with Milky and Painted Storks.



© Chan Kai Soon

Ardeidae

Grey Heron

Ardea cinerea, **Pucung Seriap Biasa, Resident, 102cm**



© Chan Kai Soon

This large heron has white head and neck with characteristic black streaks on the neck. Beak and legs are normally pale yellow but turn red during breeding as in this image. It can be found in the intertidal mudflats in Bagan Datuk and is also now common in freshwater wetlands. Due to its large size, it is usually dominant over smaller birds such as the Whiskered Terns next to it.

Ardeidae

Purple Heron

Ardea purpurea, **Pucung Serandau, Resident & Migrant, 97cm**



© Chan Kai Soon

This species has black crown and black neck plumes, chestnut neck with a purple line in adults. Juveniles are more brownish and less marked. This species is uncommon in Bagan Datuk and appears to be mostly seen resting on the mangrove trees as in this image or merely flying past. It is much more common in freshwater habitats.

Ardeidae

Great Egret

Ardea alba, **Bangau Besar, Migrant, 90cm**

This species is distributed widely and its habitats include the coastal mudflats as well as inland fresh water wetlands. In Bagan Datuk, they seem to be mostly found along the mudflats in small numbers only and are hardly seen in the fresh water swamps. They are very similar to the Intermediate Egrets in non-breeding plumage but can be distinguished from it by having its yellowish gape extending beyond the eye, or its much larger size when they appear side by side.



© Late Ooi Beng Yean

Ardeidae

Intermediate Egret

Ardea intermedia, **Bangau Sederhana, Resident & Migrant, 71cm**

Distinguishing this species from Great Egret may be difficult with both species having long kinked neck. Generally it is smaller, with a less pronounced kink at the neck, the yellowish gape not extending beyond the eye and having a black tip to the bill. Like the Great Egret, it is also found feeding both in salty water as well as fresh water swamps but it prefers wet grassland habitats the best, such as paddyland. Most of the birds are migratory but local breeding of the species had been recorded by Dato Dr Amar Singh in south Perak in 2012.



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Ardeidae

Chinese Egret

Egretta eulophotes, Bangau Cina, Migrant, 69cm



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This scarce migratory bird had been observed at least twice in Bagan Datuk during the period of the bird survey. It is distinguished from the much more abundant Little Egret with some difficulty in non-breeding plumage. Its structure is generally shorter and neck thicker. The base of the lower mandible is yellowish and legs greenish yellow. It is also very similar to the white morph of the Pacific Reef-egret but has a more slender and pointed bill. In its wintering grounds, it is distributed only at coastal areas and not found inland. It breeds in Korea and parts of China.

Ardeidae

Little Egret

Egretta garzetta, **Bangau Kecil, Resident & Migrant, 61cm**



© Chan Kai Soon

This is the most abundant egret in Malaysia, consisting of a mixture of resident and migrant populations found in both coastal areas as well as freshwater wetlands. Breeding had been recorded in Peninsular Malaysia. The thin black bill separates the species from any other egrets. The main subspecies in Malaysia has yellow feet contrasted with the black legs, which is very noticeable even from a distance. The non-breeding birds have pale yellowish-green facial skin and yellow feet which turn red during breeding season and nice long plumes will grow from their napes. Diet consists mostly of fish but may also include amphibians, crustaceans and insects.

Ardeidae

Pond-Heron

Ardeola **sp, Pucung-Padi, Migrant, 46cm**

Three species of pond-herons (Chinese, Javan and Indian) are found in Malaysia, all of which are migratory. These cannot be distinguished in non-breeding plumage but Chinese Pond-Heron is overwhelmingly the most widespread and commonest species accounting for more than 90% and may be marginally larger than the other two species.



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Ardeidae

Javan Pond-Heron

Ardeola speciosa, **Pucung-Padi Emas, Migrant, 46cm**

The Javan Pond-Heron in breeding plumage (right bird) has pale beige head and neck merging into darker buff breast, and blue-black mantle. The bird in non-breeding plumage (left bird) appears marginally larger and it is likely a Chinese Pond-Heron. Both species are found both in coastal and freshwater wetland habitats.



© Chan Kai Soon

Ardeidae

Striated Heron / Little Heron

Butorides striata, **Pucung-Bakau Biasa, Resident & Migrant, 46cm**



© Koay Zhong Ying

These birds in Malaysia are composed of a mixed population of migratory and resident birds which cannot be distinguished by appearance. This adult bird has blue-grey back, black cap and pale underparts. Juvenile birds have browner colours and the underparts are streaked. It is distributed widely in coastal and freshwater habitats, even in sewage ponds and urban storm drains. They prefer to feed alone and are popularly known to use bread crumps to attract fish closer to prey on them.

Accipitridae

Black Baza

Aviceda leuphotes, **Helang-Gerigi Hitam, Migrant, 33cm**



© Chan Kai Soon

This species has a distinctive appearance with a prominent black crest and mostly black and white plumage. The male has white scapulars, secondary coverts and on the secondaries. The female has white on the scapulars only and more chestnut bands on the underside. They are crepuscular and gregarious during migration. This is a passage migrant in Bagan Datuk and only few birds were observed here during the period of the survey. The subspecies that migrate to Malaysia breeds in north India to south east China, Myanmar and Thailand.

Accipitridae

Crested Serpent-Eagle

Spilornis cheela, **Helang-Kuik Biasa, Resident, 53cm**

This is a very common and widespread medium-sized raptor. It has large head with long black feathers on the back forming a crest. The face is bare and yellow extending to the cere. A prominent white bar at the tail could be seen in perched and flying birds. Their main diet is snakes and lizards. However, they are also known to prey on birds, amphibians and fishes. In this image, it was feeding on a crab near Jeti Beting Beras Basah.



© Chan Kai Soon

Accipitridae

Brahminy Kite

Haliastur indus, **Helang-Tembikar Merah, Resident, 43-51cm**

This is another widespread and common resident raptor. It has a distinctive reddish-brown body contrasting with white head and breast which is finely streaked. In flight juvenile birds can be distinguished from Black Kite by the shorter wings and rounded tail. It is primarily a scavenger and also has the tendency to steal preys from other birds. In Bagan Datuk, sometimes it flies over or land onto the mudflats causing the migratory waterbirds to flee temporarily.



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Accipitridae

White-bellied Sea-Eagle

Haliaeetus leucogaster, **Helang-Laut Putih, Resident, 60-69cm**



© Koay Zhong Ying

This common resident species is frequently heard here with its loud calls resembling the honking of a goose. The adult has white head, breast, tail and underpart. The back and wings are greyish in adult. The beak is large and hooked. The tail is wedge-shaped when in flight. Feeding mostly on fishes, they also usually breed near large body of water. They are also found inland near lakes and sometimes build nests on tall pylons. This image shows the eagle flying low over water to take prey, which is a common way of finding food for this species.

Alcedinidae

Common Kingfisher

Alcedo atthis, **Rajaudang Cicit, Resident & Migrant, 17cm**



© Koay Zhong Ying

This is a small common migrant with turquoise blue upperparts and brownish underparts, rufous ear patch, short tail and black bill. The lower mandible in female has orange-red base. Its high pitch whistle usually gives away its presence or location although it is small. It feeds on small fishes in freshwater by diving and its presence is an indicator of good freshwater quality.

Alcedinidae

Stork-billed Kingfisher

Pelargopsis capensis, **Pekaka-Emas Biasa, Resident, 37cm**

This is a large kingfisher with green back, blue wings and tail, olive-brown head and buff underparts. Its name is derived from a very large scarlet bill. It is widely distributed and lives in a variety of wetland habitats including coastal areas. It has loud calls and is territorial in behaviour.



© Chan Kai Soon

Alcedinidae

Black-capped Kingfisher

Halcyon pileata, **Pekaka Ubun Hitam, Migrant, 30cm**

This is another large kingfisher but it is a migrant. It has a distinctive black cap that contrasts with white throat, purple-blue wings and pale rufous underparts. It is found mainly in estuaries and coastal areas mainly in mangroves but occasionally can also be seen inland. This species breeds in Korea and China.



© Koay Zhong Ying

Alcedinidae

Collared Kingfisher

Todiramphus chloris, **Pekaka Bakau Biasa, Resident, 24cm**



© Koay Zhong Ying

This is a mid-sized kingfisher with very wide distribution and nearly 50 subspecies were described worldwide. The resident species in Malaysia is *T. c. humii* and it is distributed mainly in coastal mangroves because crabs are its favourite diet. It has blue to green upperparts and white to buff underparts with a white collar around the neck accounting for its name.

Meropidae

Blue-tailed Bee-eater

Merops philippinus, **Berek-Berek Zaitun Asia, Resident & Migrant, 30cm**



© Chan Kai Soon

Like all bee-eaters, this species is a richly coloured elegant slender bird with mostly green plumage, black eye stripe, yellow throat and blue tail. The diet consists mostly of insects including bees and wasps which it snatches from the air. It favours open country habitats and makes nests in sand banks. Hence they are merely passing by this area and are not seen often.

Coraciidae

Dollarbird

Eurystomus orientalis, **Tiung-Batu Biasa, Resident & Migrant, 30cm**

This species has a dark greenish-blue plumage with lighter belly and orange-red bill. It is heavily built with a large squarish head. The name is derived from a white circle on the underwing that looks like a silver dollar coin in flight. It prefers open country or open wooded areas. It nests in tree hollows.



© Chan Kai Soon

Picidae

Sunda Woodpecker

Dendrocopos moluccensis, **Belatuk-Belacan Kecil Biasa, Resident, 14cm**

This small woodpecker has brownish forehead to hindneck (It is also known as the Brown-capped Pygmy Woodpecker), brown band through ear coverts and down the sides of the neck, upperparts brown with white spots, whitish bands on tail. Underparts are whitish. Males have a very thin red line at hindcrown. The bird in this illustration lacks this field mark and hence it is a female. It closely resembles the Grey-capped Woodpecker which is not a mangrove forest species and which has a grey cap.



© Koay Zhong Ying

Picidae

Laced Woodpecker

Picus vittatus, **Belatuk-Hijau Bakau, Resident, 30cm**



© Chan Kai Soon

It has greenish upper parts, greyish face with black malar stripes, buff throat and upper breast. The rest of the underpart is buff with lace like scales. This species closely resembles Streak-breasted Woodpecker but the latter is recorded in Peninsular Malaysia in Kedah and Penang only. The male bird illustrated has a red crown while females have black crown. It mostly prefers coastal mangrove forests but is also found inland. It is often found feeding on the ground or close to ground.

Picidae

Common Flameback

Dinopium javanense, **Belatuk-Pinang Biasa, Resident, 30cm**



© Koay Zhong Ying

This species has a red rump contrasting with the black tail, white underparts with black scales and only three toes, all of which help to distinguish it from the Greater Flameback. It has a solid, unsplit black malar stripe and completely black nape. It shares the same habitat as the Greater Flameback but may prefer to feed on different species of trees instead. It may also participate in mixed species foraging flocks.

Picidae

Greater Flameback

Chrysocolaptes guttacristatus, **Belatuk-Pinang Besar Biasa, Resident, 23cm**

This is a fairly common resident species mainly of the mangrove forest but may also be found in other open forest habitat. It has a typical woodpecker shape and stance. The rump is red and tail is black. It has four toes (zygodactyl feet) unlike the similar-looking Common Flameback which only has three. It also differs by having a split black malar stripe, and black-and-white nape instead of black nape. This is a male bird which has a red crown.



© Chan Kai Soon

Acanthizidae

Golden-bellied Gerygone

Gerygone sulphurea, **Kelicap-Perepat Asia, Resident, 9cm**

This small resident has dark greyish-brown upperparts and yellowish underparts. It is a common resident of the mangrove forest and inland wooded areas including parks and gardens. Its small size makes it often heard before being seen. It builds a hanging nest like those of sunbirds and is a known brood host to the Little Bronze-Cuckoo. In Bagan Datuk, this species was observed in the same locality as this cuckoo.



© Chan Kai Soon

Artamidae

White-breasted Woodswallow

Artamus leucorynchus, **Layang-Hujan Biasa, Resident, 16cm**



© Chan Kai Soon

This species has a chunky build with greyish brown upperparts and head, white underparts and rump, and a silvery bill. They feed by gliding in the air snatching insects on the wings and they tend to be normadic following the best conditions for flying insects. This species likes to roost in large flocks. Its habitat is mostly open country such as paddy fields.

Aegithinidae

Common Iora

Aegithina tiphia, **Kunyit-Kecil Biasa, Resident, 15cm**



© Chan Kai Soon

This very common resident bird has bright yellowish underparts, greenish yellow upperparts and black wings with two wing bars. Some males have fully black crowns. It is widely distributed in various habitats including mangrove forest, lowland forests to parks and gardens. It is often very vocal with melodious calls.

Laniidae

Tiger Shrike

Lanius tigrinus, **Tirjup Harimau, Migrant, 19cm**

The adults have greyish crown and nape, upperparts chestnut with black stripes and hence its name. Its underpart is whitish. First winter birds as illustrated have chestnut head and neck instead of grey, and underparts are also whitish with scales. It is distinguished from Brown Shrike by having stripes on upperparts and in first winter birds, lack of a black mask. It breeds in the temperate regions of eastern Asia.



© Koay Zhong Ying

Laniidae

Brown Shrike

Lanius cristatus, **Tirjup Biasa, Migrant, 20cm**

This is a common and widespread migrant with brownish upper parts and creamy underparts with rufous flanks. Presence of a black eye mask is characteristic. The crown varies from brown to grey depending on subspecies. Females tend to have fine scales on underside. Juveniles can be distinguished from juvenile Tiger Shrikes by lack of stripes on the back. These birds breed in temperate Asia. In the wintering ground, they are wintering mainly in the lowlands.



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Paridae

Cinereous Tit

Parus cinereus, **Seserai Bakau, Resident, 13cm**



© Koay Zhong Ying

This species has black hood with a large white cheek patch, grey back with white wing-bar and white underparts divided by a central black band which narrows towards the vent. The central band in females is narrower. It used to be included as a subspecies of Great Tit but lacks a crest. In Malaysia, it is found only in mangrove forests. It nests in hollows in the tree.

Cisticolidae

Ashy Tailorbird

Orthotomus ruficeps, Perenjak-Pisang Kelabu Biasa, Resident, 12cm



© Koay Zhong Ying

This tailorbird species has a rufous head extending to the sides and the chin in the adult. The upperparts are dark greyish with paler underparts. It is more commonly found in mangrove habitats but is also sometimes present inland in shrubs and gardens. Like other small birds in dense foliage, it is often heard before being seen.

Hirundinidae

Barn Swallow

Hirundo rustica, Layang-Layang Hijrah, Migrant, 15cm

This species has blue upperparts and whitish underparts. The rufous forehead, chin and throat with a black breast band and a well forked tail distinguish it from the resident Pacific Swallow. These are birds of the open country as well as the towns feeding on insects on the wings. They breed in temperate North America, Europe and Asia.



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Hirundinidae

Pacific Swallow

Hirundo tahitica, Layang-Layang Biasa, Resident, 14cm

This common and widespread resident species has blue black glossy upper parts, red face and throat and dusky underparts. The tail is shorter and much less forked and it lacks a black breast band which are important field marks to separate them from the similar migratory Barn Swallow. The nest is made of mud and is often built on hard structures including concrete bridges and building. This image illustrates the birds collecting mud from the wetlands near the jetty.



© Chan Kai Soon

Zosteropidae

Swinhoe's White-eye

Zosterops simplex, Kelicap-Kacamata Biasa, Resident, 11cm



© Koay Zhong Ying

This species has yellow-green crown and upper parts, prominent white eyering and yellow upper breast. The underparts are pale greyish with central pale yellow stripe. They tend to forage in small vocal flocks and their habitat is limited to the coastal mangrove forests. It is very similar to Hume's White-eye which does not overlap in habitat. In the past, this white-eye is grouped together with some other forms in South and South East Asia as the Oriental White-eye.

Sturnidae

Common Myna

Acridotheres tristis, **Gembala-Kerbau Rumah, Resident, 25cm**



© Koay Zhong Ying

This common species has brown body, black hood, bare yellow skin behind eye, yellow bill and yellow legs. It is highly adapted to human habitats and roost in large noisy community. It was declared as an invasive species but it is itself being outnumbered by Javan Myna particularly in southern parts of Peninsular Malaysia and in Bagan Datuk, the latter has became much more common.

Sturnidae

Javan Myna

Acridotheres javanicus, **Gembala-Kerbau Sawah Jawa, Feral, 24cm**

This species has mainly black plumage with short crest on the forehead. The bill and legs are bright yellow and the iris is creamy white to yellow. It resembles the Jungle Myna but has darker plumage, a sharply demarcated white vent from dark underparts and lacks the blue-black base at the lower mandible. Although threatened in its native range in Java and Bali, it is expanding its range in Peninsular Malaysia accompanied by reduction in other myna species particularly Jungle Myna. Hybridization with Jungle Myna had been suspected and is likely to have occurred.



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Muscicapidae

Mangrove Blue-Flycatcher

Cyornis rufigastra, **Sambar-Biru Bakau, Resident, 15cm**

This species has blue upperparts and cheek, orange rufous underparts which extends to the belly. Male birds have black lores. Females (right bird in illustration) have whitish buff lores and chin. Juveniles (left bird) have duller colours with specks. This species is mostly found in mangrove forests.



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Muscicapidae

Korean Flycatcher / Yellow-rumped Flycatcher

Ficedula zanthopygia, **Sambar Kunyit Kening Putih, Migrant, 13cm**



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The male bird as illustrated has unmistakable plumage with black upper parts contrasting with white supercilium and white wing bar, rich yellowish underparts and rump. In females and first winter birds the black is replaced mostly by olive green colour and the birds appear less yellowish. It breeds in eastern Asia, Transbaikalia, Mongolia, China, Korea and western Japan.

Nectariniidae Plain-throated Sunbird / Brown-throated Sunbird

Anthreptes malacensis, **Kelicap Mayang Kelabu, Resident, 14cm**



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This is a relatively large sunbird. The male has iridescent green and purple upper parts, chestnut on the scapular, rich yellow on the underparts and a pale brownish throat. Females have olive-green upperparts. It moves slower compared to other smaller sunbirds. Feeding mainly on nectars and sometimes insects, it is widely distributed and is often associated with human habitation. This species is much less common than the Copper-throated Sunbird in Bagan Datuk.

Nectariniidae Copper-throated Sunbird

Leptocoma calcostetha, **Kelicap Bakau, Resident, 14cm, ♂**

This species is very commonly encountered in Bagan Datuk, being recorded in all visits during the bird survey. Its habitat is restricted to mangrove forests and hence its continued existence is dependent on a healthy mangrove forest system such as that of Bagan Datuk. Like most sunbirds, the male individual has colourful plumage but the iridescent red throat and blue-green colours of the head and back are seen only in good lighting condition at appropriate angles only. The colours of the throat may also vary depending on the direction of light. The yellowish pectoral tufts seen in this image are often not visible.



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Nectariniidae Olive-backed Sunbird

Cinnyris jugularis, **Kelicap Biasa, Resident, 11cm, ♂**

Males have dark iridescent blue face, throat and breast and bright yellow underparts. This image shows the male bird with minimal orange-red band on the chest. Females lack the blue iridescent parts and have broad white tips on the undertail. This species was found feeding in the same trees as the Copper-throated Sunbird. Competition for food might threaten the latter. Originally from coastal mangroves habitat, it is now strongly associated with human habitation and often nests in residential houses.



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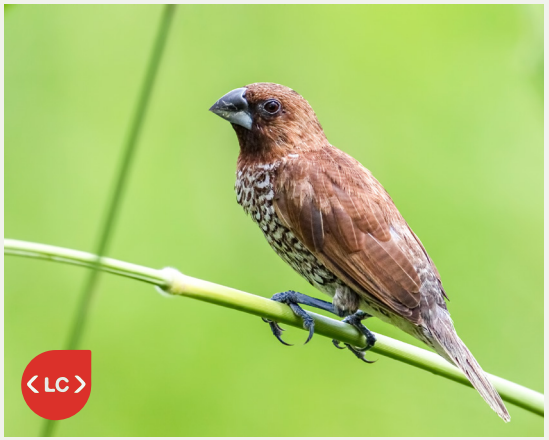
Estrildidae Scaly-breasted Munia

Lonchura punctulata, **Ciak-Padi Pinang, Resident, 11cm**



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This is one of several munia species found in the scrubs at the fringe of the mangrove forest but not within it. Adults have brownish upperparts and whitish underparts with fine brownish scales. The bill is black and conical. These birds are highly social and usually seen foraging in small flocks feeding on grass seeds, berries and small insects. This species is endemic to Asia but it had been widely introduced to other parts of the world.

7.
Birding Etiquette and Ethics

Birding is slowly gaining its popularity in Malaysia with arising awareness for nature conservation and appreciation for the beauty of birds. However, certain activities of birding could pose as threats to birds. Proper birding ethics and etiquettes are crucial to minimize impact of birding activities.

The utmost important and principal ethical rule for birding is be mindful of the wildlife. Respecting their space, avoid chasing or invading the bird's territory if the bird is showing signs of agitation such as giving alarm calls.

This rule is particularly important when watching nesting bird as they will not always flee but exhibit distraction display to divert invader's attention away from their nest. Besides, handling of birds, nests, or eggs are strictly prohibited except for recognized researchers with permits.

Secondly, reduce disturbance to the birds by avoiding making loud noise, refrain from using flash photography, or use loud and repeating call playbacks. Even though the use of recordings can be an excellent tool for attracting shy birds into view when used ethically, we should always refrain from using audio playback. A bird with territory perceives taped calls as competitor and try to fend their territory from this non-existing intruders. The birds would have use up their vital energy which would otherwise, being used for foraging and other survival activity.

Vision is highly developed and acute in bird's sense (Tedore & Nilsson, 2019). It is important to dress in neutral coloured clothing, and keep movement steady to avoid disturbance against the birds. Bird watching should be practiced without knowingly disturbing them.

Birding is a wonderful experience by connecting people with the Nature and the wilderness. However, the bird's interest must always come first regardless of whether the person's interest is to photograph, record sounds, study scientifically or simply bird watch.



After completing the bird counts at all the locations, the bird survey team members also looked for birds and do bird photography at the jetty and other locations along Bagan Datuk coast to document additional aspects of the bird life there. In this image, members were trying to photograph the migrant waterbirds that were feeding or roosting on the mudflats at Jeti Beting Beras Basah during low tides. During high tides, the mudflats are usually completely flooded and these birds will fly to their high tide roosting grounds.

7.1 Birding in The Mangrove Germplasm Heritage of Bagan Datuk

The Mangrove Germplasm Heritage of Bagan Datuk is primarily a mangrove forest patch where species including the Mangrove Blue-Flycatcher, White-throated Kingfisher, Black-capped Kingfisher and other mangrove birds could be seen.

During the migration season, the Jetty Beting Beras Basah offers a sheltered location along the coastline's mudflat for viewing waterbirds such as the Whimbrel, Curlew, Godwit and many other waders species. In addition, the cement walk leading to the jetty passes through an open wetland zone with scenic views and good opportunities to view the Stork-billed Kingfisher, sunbirds, raptors, pond herons and egrets.



This is the Jeti Beting Beras Basah public car park. The car park provides a general view of the mangrove forests and the wetlands associated with it. Birds, particularly egrets, raptors, swallows and swifts could be readily observed from here. Birds flying past the mangrove forests are also often sighted.



Jeti Beting Beras Basah can be easily accessed via a concrete boardwalk with a on the right. This location is suitable for observing birds of the mangrove forests as well as the wetlands but it is too far from the coastal mudflats. Hence, observation of the migratory waterbirds will need to be done from the jetty.



The coastal mudflats at Sungai Tiang is a good location for observing shorebirds, herons, egrets and other waterbirds. In this image, birders were observing waders that were driven closer to the bund road by rising tides. This provides a good opportunity to observe and photograph these birds at closer distances.

7.2
Flyway Komuniti — Beting Nature Society

The second component of The Mangrove Germplasm Heritage of Bagan Datuk was to create awareness among the communities about the importance of migratory birds and mangroves. A series of awareness activities were conducted for the local communities such as exhibitions, dialogue sessions, and communities' perception survey on the migratory birds and flyway conservation at Bagan Datuk.

Following the findings in November about the high tide roosting site of migratory waterbirds and the keen interest of the communities to learn more about the birds, MNS decided to formally form a group to be the stewards of the birds and mangroves in Jeti Beting Beras Basah.With the blessings of the Orang Besar Jajahan Bagan Datuk, the Beting Nature Society was formed on 27 January 2019 with 40 villagers of different genders and age from Kampung Sungai Betul and Kampung Sungai Tiang. The formation of BNS concided with the AWC (Malaysia) period. Hence, BNS conducted its first activitiy as a Society by monitoring and counting waterbirds using binoculars and spotting scopes.

The main objective of the Beting Nature Society is to promote and support the conservation of the unique mangrove biodiversity of the Mangrove Germplasm site and the Jeti Beting Beras Basah, which is the royal historical site where the new Sultan of Perak must visit as part of the coronation ceremonies. The BNS committee is keen to develop the area into an eco-tourism site. Since then, the society is now officially the fourth Flyway Komuniti group (developed by MNS) and has actively participated in the training courses and events organized by MNS. This includes the annual AWC, AWC Seminar and waterbirds identification course, Festival of Wings, and World Firefly Day celebration. The committee also self-initiated the site cleanup activities and invited local schools to visit Jeti Beting Beras Basah and learn about the wetlands and waterbirds diversity.



Beting Nature Society is established in conjunction with Asian Waterbird Census (AWC) 2019 to celebrate the concerted efforts of local community in conservation of Bagan Datuk's mangrove.

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Appendix I: Checklist of the birds of Bagan Datuk (Clements Checklist, 2019)

Status Code:

Country Status

R = Resident M = Migrant F = Feral V = Vagrant

Global conservation status based on IUCN 2020

EN = Endangered
VU = Vulnerable
NT = Near Threatened
LC = Least Concern
DD = Data Deficient

Protection status under Wildlife Conservation Act 2010

TP = Totally Protected
P = Protected
NP = Not Protected

Footnote

Subsequent to the survey and during the editing of this booklet, the MNS-BCC published the latest Malaysia Clements Bird Check-list (2019), the following were taken into consideration in the text, Swinhoe's White-eye, instead of Oriental White-eye in Check-list of 2015. The common names of birds in Malays were adopted from Tou Jing Yi's "Nama-nama Burung di Malayisa".

No.	Family	Species name	Common name	Country status	IUCN Status	Protection status
1.	Phasianidae	*Gallus gallus*	Red Junglefowl	R	LC	P
2.	Columbidae	*Streptopelia chinensis*	Spotted Dove	R	LC	NP
3.		*Chalcophaps indica*	Asian Emerald Dove	R	LC	P
4.		*Geopelia striata*	Zebra Dove	R	LC	NP
5.		*Treron vernans*	Pink-necked Green-Pigeon	R	LC	P
6.		*Ducula bicolor*	Pied Imperial-Pigeon	R	LC	TP
7.	Cuculidae	*Centropus sinensis*	Greater Coucal	R	LC	TP
8.		*Phaenicophaeus tristis*	Green-billed Malkoha	R	LC	TP
9.		*Chrysococcyx basalis*	Horsfield's Bronze-Cuckoo	V	LC	TP
10.		*Chrysococcyx minutillus*	Little Bronze-Cuckoo	R	LC	TP
11.	Caprimulgidae	*Caprimulgus macrurus*	Large-tailed Nightjar	R	LC	TP
12.	Apodidae	*Aerodramus germani*	Germain's Swiftlet	R	LC	NP
13.	Rallidae	*Amaurornis phoenicurus*	White-breasted Waterhen	R, M	LC	P

No.	Family	Species name	Common name	Country status	IUCN Status	Protection status
14.	Charadriidae	*Pluvialis squatarola*	Black-bellied Plover	M	LC	TP
15.		*Pluvialis fulva*	Pacific Golden-Plover	M	LC	TP
16.		*Vanellus indicus*	Red-wattled Lapwing	R	LC	TP
17.		*Charadrius mongolus*	Lesser Sand-Plover	M	LC	TP
18.		*Charadrius leschenaultii*	Greater Sand-Plover	M	LC	TP
19.		*Charadrius alexandrinus*	Kentish Plover	M	LC	TP
20.		*Charadrius alexandrinus dealbatus*	White-faced Plover	M	DD	TP
21.	Scolopacidae	*Numenius phaeopus*	Whimbrel	M	LC	TP
22.		*Numenius arquata*	Eurasian Curlew	M	NT	M
23.		*Limosa lapponica*	Bar-tailed Godwit	M	NT	TP
24.		*Limosa limosa*	Black-tailed Godwit	M	NT	TP
25.		*Arenariainterpres*	Ruddy Turnstone	M	LC	TP
26.		*Calidris tenuirostris*	Great Knot	M	EN	TP
27.		*Calidris falcinellus*	Broad-billed Sandpiper	M	LC	TP
28.		*Calidris ferruginea*	Curlew Sandpiper	M	NT	TP
29.		*Calidris ruficollis*	Red-necked Stint	M	NT	TP
30.		*Calidris minuta*	Little Stint	M	LC	TP
31.		*Limnodromus semipalmatus*	Asian Dowitcher	M	NT	TP
32.		*Xenus cinereus*	Terek Sandpiper	M	LC	TP
33.		*Actitis hypoleucos*	Common Sandpiper	M	LC	TP
34.		*Tringa nebularia*	Common Greenshank	M	LC	TP
35.		*Tringa guttifer*	Nordmann's Green-shank	M	EN	TP
36.		*Tringa totanus*	Common Redshank	M	LC	TP
37.	Glareolidae	*Glareola maldivarum*	Oriental Pratincole	M	LC	TP
38.	Laridae	*Sternula albifrons*	Little Tern	R,M	LC	TP
39.		*Gelochelidon nilotica*	Gull-billed Tern	M	LC	TP
40.		*Chlidonias leucopterus*	White-winged Tern	M	LC	TP
41.		*Chlidonias hybrida*	Whiskered Tern	M	LC	TP
42.		*Sterna hirundo*	Common Tern	M	LC	TP
43.		*Thalasseus bergii*	Great Crested Tern	M	LC	TP
44.		*Thalasseus bengalensis*	Lesser Crested Tern	M	LC	TP
45.	Ciconiidae	*Leptoptilos javanicus*	Lesser Adjutant	R	VU	TP
46.	Ardeidae	*Ardea cinerea*	Gray Heron	R,M	LC	TP
47.		*Ardea purpurea*	Purple Heron	R,M	LC	TP
48.		*Ardea alba modesta*	Great Egret	M	LC	TP
49.		*Ardea intermedia*	Intermediate Egret	R.M	LC	TP
50.		*Egretta eulophotes*	Chinese Egret	M	VU	TP
51.		*Egretta garzetta*	Little Egret	R,M	LC	TP
52.		*Bubulcus ibis*	Cattle Egret	R,M	LC	TP
53.		*Ardeola speciosa*	Javan Pond-Heron	M	LC	TP
54.		*Butorides striata*	Striated Heron	R,M	LC	NP
55.		*Nycticorax nycticorax*	Black-crowned Night-Heron	R	LC	TP

No.	Family	Species name	Common name	Country status	IUCN Status	Protection status
56.	Accipitridae	*Elanus caeruleus*	Black-winged Kite	R	LC	TP
57.		*Aviceda leuphotes*	Black Baza	M	LC	TP
58.		*Spilornis cheela*	Crested Sepent-Eagle	R	LC	TP
59.		*Nisaetus cirrhatus*	Changeable Hawk-Eagle	R	LC	TP
60.		*Accipiter trivirgatus*	Crested Goshawk	R	LC	TP
61.		*Haliastur indus*	Brahminy Kite	R	LC	TP
62.		*Haliaeetus leucogaster*	White-bellied Sea-Eagle	R	LC	TP
63.	Strigidae	*Strix seloputo*	Spotted Wood-Owl	R	LC	TP
64.	Alcedinidae	*Alcedo atthis*	Common Kingfisher	M	LC	TP
65.		*Pelargopsis capensis*	Stork-billed Kingfisher	R	LC	TP
66.		*Halcyon smyrnensis*	White-throated Kingfisher	R	LC	TP
67.		*Halcyon pileata*	Black-capped Kingfisher	M	LC	TP
68.		*Todiramphus chloris*	Collared Kingfisher	R,M	LC	TP
69.	Meropidae	*Merops viridis*	Blue-throated Bee-eater	R,M	LC	TP
70.		*Merops philippinus*	Blue-tailed Bee-eater	R,M	LC	TP
71.	Coraciidae	*Eurystomus orientalis*	Dollarbird	R,M	LC	TP
72.	Picidae	*Yungipicus moluccensis*	Sunda Woodpecker	R	LC	TP
73.		*Chrysocolaptes guttacristatus*	Greater Flameback	R	LC	TP
74.		*Dinopium javanense*	Common Flameback	R	LC	TP
75.		*Picus vittatus*	Laced Woodpecker	R	LC	TP

No.	Family	Species name	Common name	Country status	IUCN Status	Protection status
76.	Falconidae	*Microhierax fringillarius*	Black-thighed Falconet	R	LC	TP
77.	Acanthizidae	*Gerygone sulphurea*	Golden-bellied Gerygone	R	LC	TP
78.	Campephagidae	*Lalage nigra*	Pied Triller	R	LC	TP
79.	Oriolidae	*Oriolus chinensis*	Black-naped Oriole	R,M	LC	TP
80.	Artamidae	*Artamus leucorynchus*	White-breasted Woodswallow	R	LC	NP
81.	Aegithinidae	*Aegithina tiphia*	Common Iora	R	LC	TP
82.	Rhipiduridae	*Rhipidura javanica*	Malaysian Pied-Fantail	R	LC	TP
83.	Dicruridae	*Dicrurus leucophaeus*	Ashy Drongo	R,M	LC	TP
84.	Laniidae	*Lanius tigrinus*	Tiger Shrike	M	LC	TP
85.		*Lanius cristatus*	Brown Shrike	M	LC	TP
86.	Corvidae	*Corvus splendens*	House Crow	F	LC	NP
87.		*Corvus macrorhynchos*	Large-billed Crow	R	LC	NP
88.	Paridae	*Parus cinereus*	Cinereous Tit	R	LC	TP
89.	Cisticolidae	*Orthotomus sutorius*	Common Tailorbird	R	LC	TP
90.		*Orthotomus ruficeps*	Ashy Tailorbird	R	LC	TP
91.		*Prinia rufescens*	Rufescent Prinia	R	LC	TP
92.		*Prinia flaviventris*	Yellow-bellied Prinia	R	LC	TP
93.	Hirundinidae	*Hirundo rustica*	Barn Swallow	M	LC	TP
94.		*Hirundo tahitica*	Pacific Swallow	R	LC	TP
95.	Pycnonotidae	*Pycnonotus goiavier*	Yellow-vented Bulbul	R	LC	NP
96.		*Pycnonotus plumosus*	Olive-winged Bulbul	R	LC	TP
97.	Zosteropidae	*Zosterops simplex*	Swinhoe's White-eye	R	LC	P
98	Pellorneidae	*Turdinus abbotti*	Abbott's Babbler	R	LC	TP

No.	Family	Species name	Common name	Country status	IUCN Status	Protection status
99.	Sturnidae	*Aplonis panayensis*	Asian Glossy Starling	R	LC	NP
100.		*Gracula religiosa*	Common Hill Myna	R	LC	P
101.		*Acridotheres tristis*	Common Myna	R	LC	NP
102.		*Acridotheres javanicus*	Javan Myna	F	VU	NP
103.	Muscicapidae	*Muscicapa sibirica*	Dark-sided Flycatcher	M	LC	TP
104.		*Muscicapa dauurica*	Asian Brown Flycatcher	M	LC	TP
105.		*Copsychus saularis*	Oriental Magpie-Robin	R	LC	NP
106.		*Cyornis rufigastra*	Mangrove Blue Flycatcher	R	LC	TP
107.		*Ficedula zanthopygia*	Korean Flycatcher	M	LC	TP
108.	Nectariniidae	*Anthreptes malacensis*	Plain-throated Sunbird	R	LC	TP
109.		*Leptocoma calcostetha*	Copper-throated Sunbird	R	LC	TP
110.		*Cinnyris jugularis*	Olive-backed Sunbird	R	LC	TP
111.	Ploceidae	*Ploceus philippinus*	Baya Weaver	R	LC	P
112.	Estrildidae	*Lonchura striata*	White-rumped Munia	R	LC	NP
113.		*Lonchura punctulata*	Scaly-breasted Munia	R	LC	NP
114.		*Lonchura atricapilla*	Chestnut Munia	R	LC	NP
115.		*Lonchura maja*	White-headed Munia	R	LC	NP
116.	Passeridae	*Passer montanus*	Eurasian Tree Sparrow	R	LC	NP



White-bellied Sea-Eagle ©Chan Kai Soon



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