Potential of Avitourism in Tanjung Laboh, Johor

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Abstract. Avitourism or birdwatching tourism is currently an emerging sub-sector in nature-based tourism industry. Although birdwatching is well established in Johor, however, the focus only concentrated on the famous birdwatching hotspot areas such as Panti Bird Sanctuary, Endau-Rompin National Park and many more. Other areas in Johor was remained understudied and the potential as Avitourism/birdwatching spot was remained undiscovered. Hence, this study aims to fill in this loophole by providing the checklist of the bird species and investigating the potential of Avitourism in Tanjung Laboh, Johor. The method used was a direct observation by using a binocular (10 x 50 magnifications) and a video recorder. For the evaluation of Avitourism, a set of questionnaire was distributed among Tanjung Laboh villagers consisting of fifteen respondents. Determination of flagship species was done based on the criteria of good nature tourism products modified from WTO/UNDP. A total of 21 bird species were recorded in Tanjung Laboh. From this, 18 bird species are resident, and three bird species are migrant. In terms of conservation status, 18 species are listed as Least Concern (LC) and three species are Vulnerable (VU). Five species were chosen as flagship species due to their high potential to be developed as a product for Avitourism. The species are Red-wattled Lapwing (*Vanellus indicus*), White Breasted Waterhen (*Amaurornis phoenicurus*), Greater Flameback (*Chrysocolaptes lucidus*), White-bellied Sea-eagle (*Haliaeetus leucogaster*) and Lesser Adjutants (*Leptoptilos javanicus*) because of its higher score as a product in Avitourism which includes the criteria such as safety, reliability of a sighting, morphological attractiveness, behavioral enticement, rarity, endemism, and cultural linkages. Therefore, it can be concluded that Tanjung Laboh has a high potential to be develop as one of the birdwatching and Avitourism spot in Johor.

1. Introduction

Being one of the megadiverse countries, Malaysia is a host to a myriad of bird species. It is estimated that about 785 bird species belonging to 97 families can be found in Malaysia [1]. In terms of biodiversity context, the study of the bird or ‘ornithology’ in Malaysia, is not a new field, however, there still a knowledge gap in this field in which most of the previous study focuses more on the ecological parts such as diversity, yet, the other field of the study remained poorly investigated.
Avitourism or bird-watching tourism is currently an emerging sub-sector in the nature-based tourism industry where birdwatching is the sole purpose or key element for tourists to participate in such tourism [2]. Avitourism brings innumerable benefits including socio-economic development especially among western countries [3] and also assists in nature and bird conservation [4]. The rapid growth of birdwatching and its high potential for providing a financial motivation for local people to protect natural areas merits a comprehensive review of birdwatching from a conservation biology perspective [5].

Johor, the third largest state in Peninsular Malaysia, holds almost half of the birds’ species found in Malaysia, which counts a total of 450 bird species [6]. This shows that Johor possesses great potential as a birdwatching destination in Malaysia. However, birdwatching in Johor concentrated only on a few famous hotspots such as Endau Rompin State Park, Panti Forest Reserve, and Benut Mangrove Forest Reserve [7]. Lack of scientific research on bird diversity and the investigation on the potential of the other areas as a birdwatching/avitourism spot are among the reasons why the potential of other areas as birdwatching/Avitourism spots was undiscovered in Johor. Therefore, it can be concluded that Tanjung Laboh, Johor is indeed has a great potential to be developed as one of Avitourism attraction in Johor.

2. Materials and Method

2.1. Study Area
Tanjung Laboh is located on the West Coast of Peninsular Malaysia within Batu Pahat District, Johor (1.7376° N, 102.9937° E) (Figure 1). The study was conducted in Tanjung Laboh village that consists of several environments including the mangrove area, grassland, and pond areas.

![Figure 1: Map of Tanjung Laboh, Johor.](image-url)
2.2. Methodology

2.2.1 Species count This study was conducted from July until August 2018. Direct observation with the aid of the binocular (10 x 50 magnifications) and a video recorder was used to record the bird species present in the study area. The recorded birds were identified based on [7].

2.2.2 Evaluation of Potential of Avitourism in Tg. Laboh, Johor To investigate the potential of Avitourism in Tanjung Laboh, Johor, two methods were conducted which are questionnaires and the evaluation of the flagship species. A set of questionnaires were distributed to 15 respondents (the villagers) consisting of two parts which are part A, demography questions and part B, the knowledge on birdwatching among the villagers. For the determination of flagship species, 7 criteria of good nature tourism products were used based on the modified criteria of good nature tourism products by WTO/UNDP which are safety, reliability of sighting, morphological attractiveness, behavioral enticement, rarity, endemism and cultural linkages [8][9].

3. Result and Discussion

3.1 Bird checklist
A total of 21 bird species were recorded throughout the sampling duration. Eighteen out of 21 species were listed as Least Concern (LC) and three species are Vulnerable (VU) according to the IUCN Red List of Threatened Species. The summary of the recorded bird species is listed in Table 1.

Table 1: Checklist of bird species in Tanjung Laboh, Johor.

| No. | Name                  | Scientific Name                  | Local Name            | Distribution Status | IUCN Status |
|-----|-----------------------|----------------------------------|-----------------------|---------------------|-------------|
| 1.  | Greater Flameback     | *Chrysococletes lucidus*         | Belatuk Pinan Besar   | R                   | LC          |
| 2.  | Large Green-pigeon    | *Treron capellei*                | Punai Besar/Bakok/Lengguak | R                   | VU          |
| 3.  | Common Myna           | *Acridotheres tristis*           | Tiong Gembala Kerbau  | R                   | LC          |
| 4.  | Collared Kingfisher   | *Todiramphus chloris*           | Pekaka Bakau          | R                   | LC          |
| 5.  | Lesser Whistling-duck | *Dendrocyna javanica*            | Belibis Kecil         | R                   | LC          |
| 6.  | Grey Heron            | *Ardea cinerea*                 | Pucung Seriap         | R                   | LC          |
| 7.  | Red-wattled Lapwing   | *Vanellus indicus*              | Rapang Minta Duit     | R                   | LC          |
| 8.  | White Breasted Waterhen | *Amaururnis phoenicurus*     | Ruak-Ruak            | R                   | LC          |
| 9.  | White-throated Kingfisher | *Halcyon smyrnensis*       | Pekaka Dada Putih     | R                   | LC          |
| 10. | Zebra dove            | *Geopelia striata*              | Merbuk                | R                   | LC          |
| 11. | Javan Myna            | *Acridotheres javanicus*        | Tiong Jawa            | R                   | VU          |
| 12. | Little Heron          | *Butorides striata*             | Pucung Keladi         | R                   | LC          |
| 13. | Great Egret           | *Casmerodius albus*             | Bangau Besar          | R, M                | LC          |
| 14. | Little Egret          | *Egretta garzetta*              | Bangau Kecil          | R, M                | LC          |
| 15. | Common Redshank       | *Tringa totanus*                | Kedidi Kaki Merah     | M                   | LC          |
| 16. | Kentish Plover        | *Charadrius alexandrinus*       | Rapang Cina           | M                   | LC          |
| 17. | Lesser Adjutant       | *Leptoptilos javanicus*         | Upih Botak            | R                   | VU          |
| 18. | White-bellied Sea-eagle | *Haliaetus leucogaster*   | Helang Laut / Siput   | R                   | LC          |
| 19. | Grey-capped           | *Dendrocopos*                   | Belatuk Kecil Ubun    | R                   | LC          |
3.2 Evaluation of Potential of Avitourism in Tanjung Laboh, Johor

To investigate the potential of Avitourism in Tanjung Laboh, a set of questionnaires were distributed to 15 respondents consisting of villagers around Tanjung Laboh area. Table 2 summarize the result of the questionnaire for Part A, demography questions.

| Profiles | Items                  | Total number | Percentage (%) |
|----------|------------------------|--------------|----------------|
| Gender   | Male                   | 10           | 67             |
|          | Female                 | 5            | 33             |
|          | 11-20 years old        | 1            | 7              |
|          | 21-30 years old        | 4            | 27             |
|          | 31-40 years old        | 7            | 47             |
|          | >40 years old          | 3            | 20             |
|          | SPM                    | 8            | 53             |
| Education| Diploma/Matriculation/STPM | 4          | 27             |
|          | Bachelor degree        | 1            | 7              |
|          | Others                 | 2            | 13             |
|          | Self-employ            | 6            | 40             |
| Occupation| Government servant    | 5            | 33             |
|          | Not working            | 4            | 27             |

*Note: R = Resident; M = Migrant, LC = Least Concern, VU = Vulnerable

For Part B, several questions were asked in the questionnaire regarding the knowledge on birdwatching among the villages such as the suitability of bird species as a product for nature tourism, the suitability of Tanjung Laboh to be one of the destinations for birdwatching, knowledge of birdwatching, involvement in previous birdwatching activities and common bird species that can be found in Tanjung Laboh. The obtained results is summarize in Table 3.

| Question                                           | Option     | Total number | Percentage (%) |
|----------------------------------------------------|------------|--------------|----------------|
| Do you think bird is suitable to be a nature        | Yes        | 15           | 100            |
| tourism product?                                   | No         | 0            | 0              |
| Do you think Tanjung Laboh have a potential to be a| Yes        | 15           | 100            |
| birdwatching destination?                          | No         | 0            | 0              |
| Do you know about birdwatching activities?         | Yes        | 13           | 87             |
|                                                   | No         | 2            | 13             |
| Do you have any experience in birdwatching         | Yes        | 1            | 7              |
| activities?                                        | No         | 14           | 93             |

For the first and second questions regarding the suitability of the bird as nature tourism product and suitability of Tanjung Laboh as a birdwatching destination, all 15 respondents agreed with the statements. The reason why they agreed with the statements is because of the variety of bird species existed in their area. Besides that, they also believed that by having tourism activities in their area, their sources of income can be improved in the form of they can work as tour guides and open the souvenir shops there. This can be supported by the previous study by [10] which stated that the source of income can be generated by selecting and training the local birding guides especially from the low-income communities and give them opportunities in conservation interest. For the question regarding the birdwatching knowledge, 13 respondents known about birdwatching activities while 2 respondents...
are clueless about birdwatching. Most of them knew about birdwatching activities from the mass media such as newspapers, television programs, and others. For those who responded that they knew about birdwatching, only 1 had experienced the birdwatching activities while the rest never experience it themselves. For the last question, they were asked about the bird species that can be found around their area. Based on their answer, the eagle was the most frequent bird species found around the Tanjung Laboh area, followed by kingfisher, magpies, doves, pigeons, sparrows, Weaver, hummingbird, dove, and myna.

From the checklist of the bird species found in Tanjung Laboh, the flagship species were identified. Bird species that fulfilled most of the criteria of good nature tourism products were chosen as flagship species. The summarized result is as in Table 4.

| Criteria                     | Red-wattled Lapwing (V. indicus) | White Breasted Waterhen (A. phoenicurus) | Greater Flameback (C. lucidus) | White-bellied Sea-eagle (H. leucogaster) | Lesser Adjutants (L. javanicus) |
|------------------------------|----------------------------------|----------------------------------------|--------------------------------|----------------------------------------|----------------------------------|
| Safety                       | √                                |                                        |                                |                                        | √                                |
| Reliability of sightseeing   | √                                |                                        |                                |                                        | √                                |
| Morphological attractiveness | √                                |                                        |                                |                                        | √                                |
| Behavioral Enticement        | √                                |                                        |                                |                                        | √                                |
| Rarity                       |                                  |                                        |                                |                                        | √                                |
| Endemism                     |                                  |                                        |                                |                                        |                                  |
| Cultural linkages            | √                                |                                        |                                |                                        | √                                |

3.2.1 Red-wattled Lapwing (V. indicus) Red-wattled Lapwing (Figure 2) fulfilled five out of seven criteria in nature tourism products which are safety, reliability of sighting, morphological attractiveness, behavioral enticement, and cultural linkages.

In terms of safety, Red-wattled Lapwing is safe to see. It is not dangerous, harmful, or attacked when humans approaching. This species can frequently be seen around an open area or near a water body in Tanjung Laboh. It has a unique morphology in which the color of these species are attractive with black head and breast, white ear coverts, bronze-brown upperparts, white-collar and underparts, yellow legs, red bill with a dark tip and small red wattle in front of eyes [7].

Besides that, it has a unique behavior in terms of the voice produced. The voice produced by this species was loud and high-pitched and the sounds are similar to the words as “did-he-do-it” or “pity-to-do-it” leading to the name of “did-he-do-it” bird. This species is often active a night, calling intermittently [11]. When hunting, they use a characteristic run-and-pause behavior that will confuse the predators [12]. The habits for this species are usually in pairs, feeding in typical plover fashion, making short runs, and tilting to pick up food material [7]. In feeding behavior, they will offer the meal to its partner first. The lovely couple went on to pass the prey to-and-fro for a good three to four rounds before it was eventually eaten by the first bird [13]. They eat insects, snails, and other invertebrates mostly picked from the ground [11]. They may sometimes make use of the legs to disturb insect prey. When nesting they will attempt to dive bomb or distract potential predators [11]. Both the male and female incubate the eggs and divert predators using distraction displays or flash their wings to deter any herbivores that threaten the nest and males appear to relieve the females incubating at the nest particularly towards the hot part of noon [11].

It can be found in South-West Asia through the Indian subcontinent and southern China to South-East Asia [7]. This species is locally common resident at low elevations, south to Johor. Some of the

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Table 4: determination of flagship species based on the modified criteria of good nature tourism products by WTO/UNDP
27 popular myths about this bird are, the call of a Lapwing flying over the house at night will bring bad news. People also think that eating the eggs of this bird will reduce sleep considerably [14]. Height at which Lapwing builds their nest is believed to be an indicator of the amount of rainfall in a particular season. The higher the nest, it means more rainfall would occur [14].

3.2.2 White Breasted Waterhen (\textit{A. phoenicurus}) White-breasted waterhen (Figure 3) fulfilled five out of seven criteria in nature tourism products which are safety, reliability of sighting, morphological attractiveness, behavioral enticement, and cultural linkages.

Firstly, White-breasted Waterhen are safe to see. It is not dangerous, harmful, or attacked when humans approaching. This species can frequently be seen as they are roaming around an open area or near a water body. The size of this species is about 33 cm (13 in) [7]. It has a white face, white underparts, dark grey, and a yellow bill with a red base diagnostic. The under tail coverts cinnamon and have 28 greenish legs. During the breeding season, it will usually produce a loud call, “kru-ak, kru-ak, kru-ak-a-wak-wak” which may continue for 15 minutes or more [15]. When they sense danger, they immediately take cover in reeds or climb high into bushes or shrubs and they prefer not to fly long distances [7]. They are usually solitary or in small loose groups. When feed, it picks up while walking, with tail held upright, and flicking it. It is clumsy among branches, due to its enormous feet with long toes. However, its slender body allows it to slip through the dense vegetation [16].

The distribution of this species is quite large covering the Indian subcontinent, Southern China to Southeast Asia with the northern population wintering in Southeast Asia. It is a common and widespread resident and migrant at low elevations, south to Singapore [7]. This species is called “ruak-ruak” in Malay, they are using this bird as “burung pemikat” [17]. Furthermore, this species is also protected under the Protection of Wildlife Act 1972 (Act 6/72) [7].

3.2.3 Greater Flameback (\textit{C. lucidus}) Greater flameback (Figure 4) fulfilled three out of seven criteria in nature tourism products which are safety, morphological attractiveness and behavioral enticement.

Greater flameback is safe to see. This species has unique morphology in which their body color is bright and attractive. The back and wings are golden yellows to dark brown. The adult male Greater flameback has a red crown while the females have black spotted with white, yellow, or brown with lighter dots at the crown [15]. This species has a straight pointed bill, a stiff tail to provide support against tree trunks, and zygodactyl or “yoked” feet, with two toes pointing forward, and two backward [18]. Size of this species is about 33 cm (13 in) [7].

Greater flameback frequently be seen at the top of the tree, usually in pairs, ‘drums’ loudly and it makes noise all the time [7]. It can fly very quickly and straight between the trees. It clings on the tree firstly from the lower stem and then jumps around the tree to the higher level. The Greater flameback has the behavior which it uses its mouth to knock on the tree to make an echo sound that can be heard even in the far distance and they use drumming as the mode of communication unlike other songbirds [19]. When the woodpecker species drums on a resonant object, the sound can be heard at far distances by other woodpecker birds and they are recognized the sound by its pattern and tempo, and birds of the same species can be attracted to potential mates through drumming [19]. At the same time, drumming also alerts the competitors that the nearby territory is claimed and can be defended by a strong, vibrant bird that can produce good drumming [19]. Greater flameback has a distinct series of sharp notes, “di-di-di-di-di-di” that sounds like a large cicada [7].

Its distribution covers the area of the Indian subcontinent through South-East Asia to Sumatra, Java, Bali, and the Philippines and it is uncommon and localized residents at low elevations, principally in coastal districts, south to Johor [7]. Greater flameback was difficult to see. In terms of reliability of sighting, this bird not fulfilled the criteria as it only spotted two to three times during the sampling period.
3.2.4 *White-bellied Sea-Eagle* (*H. leucogaster*) White-bellied Sea-eagle (Figure 5) fulfilled five out of seven criteria in nature tourism products which are safety, reliability of sighting, morphological attractiveness, behavioral enticement and cultural linkages.

This species is safe to see. Based on the questionnaire and interview conducted with the villagers, it is one of the common species found in their area. This species usually found when there is a large body of inland waterways they are also normally seen perched high in a tree, or soaring over waterways and near land. The size of this species is about 60–69 cm (24–28 in) [7]. It has a white head and underparts contrasting with grey upperparts. They are large pale eagle with long, broad wings (narrower at tips) and short, wedge-shaped tail [7]. When soaring, wings are held forward and raised in a shallow ‘V’ and in underwing flight pattern, white wing coverts contrast with black flight feathers [7].

White-bellied Sea-eagle is a skilled hunter and will attack prey up to the size of a swan and they disturb the smaller birds, forcing them to drop any food that they are carrying [20]. It feeds on aquatic animals, such as fish, turtles, and sea snakes, but it takes birds and mammals as well [7]. In addition, it builds a large stick nest in tall trees or on rocky ledges and also on tall telecommunication masts. This species produces a series of loud and deep nasal goose-like honks, “kank-kank-kank-kank”, “blank-blank-blank-blank-blank”, or shorter “ken-ken-ken” and “kaa-kaa-kaa” uttered both in flight and while perched [15].

The distribution of this species is occurring within the range of Indian subcontinent, southern China, and South-East Asia to the Indonesian Archipelago, Australia and the western Pacific and it was a common resident at low elevations in coastal districts, including most offshore islands, south to Singapore [7]. A Malay name is *burung hamba siput* which in Malay tales told of the sea-eagle screaming at the turning of tides to warn the shellfish. The White-bellied Sea-eagle is also the symbol of the state of Selangor [21].

3.2.5 *Lesser Adjutant* (*L. javanicus*) Lesser Adjutant (Figure 6) fulfilled five out of seven criteria in nature tourism products which are safety, reliability of sighting, morphological attractiveness, behavioral enticement, and rarity.

Lesser Adjutant is safe to see as it only roaming at the mudflat area. It is a large bird with a size of 114 cm (45 in) and it has pale, long, and thick bills [7]. The upper body and wings are glossy dark grey-black and the underside (chest, abdomen, and under tail feathers) are white [7]. The neck and head are mostly featherless (except for a few scattered hair-like feathers) and mostly yellowish in color with a wine-red tinge to the sides of the head and pale forehead and it flies with neck retracted in an ‘S’ shape [7]. Lesser Adjutants forages by walking and probing into the mud. It may sometimes thrust the head and partially the neck into the mud while searching the prey such as fish, frogs, reptiles, large invertebrates, small rodents and also takes carcass [22] Their feeding behavior is regulated by the tides, and the Lesser Adjutant often rests in mangroves at high tide [23].

Lesser adjutants is a solitary bird, they only form groups during the breeding season [7]. When building the nest, they will occupy preferred trees, and males will claim suitable nesting branches and chasing away competitors [22]. This species is silent and does not produce any sound except for the clattering of the bill at the nest [22]. Their distribution covers the Indian subcontinent area, and southern China through South-East Asia to the Greater Sundas [7]. Lesser Adjutants are vulnerable according to the IUCN status. The lesser adjutant has undergone a rapid decline in numbers recently, and it is now rare throughout its range [24]. The previous study by [25] shows at least 83 individuals were recorded in 2004, 26 individuals in 2005, and 25 individuals observed in 2006 around the specific locations in Peninsular Malaysia because of their rarity.
4. Conclusion
It can be concluded that Tanjung Laboh, Johor is indeed has a great potential to be developed as one of Avitourism attraction in Johor. The presence of variability of bird species from different ecosystems such as mangrove area, grassland and pond can highlight the potential of this area as a birdwatching area. The flagship species such as Red-wattled Lapwing (V. indicus), White Breasted Waterhen (A. phoenicurus), Greater Flameback (C. lucidus), White-bellied Sea-eagle (H. leucogaster) and Lesser Adjutants (L. javanicus) that fulfill most of the good nature tourism product criteria can boost the attraction of Avitourism in this area.

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Figure 2: Red-wattled Lapwing
(Vanellus indicus)

Figure 3: White Breasted Waterhen
(Amaururnis phoenicurus)

Figure 4: Greater Flameback
(Chrysocolaptes lucidus)

Figure 5: White-bellied Sea-Eagle
(Haliaeetus leucogaster)

Figure 6: Lesser Adjutant
(Leptoptilus javanicus)