

LAPWINGS (CHARADRIIDAE: VANELLINAE) OF SINGAPORE

A. F. S. L. Lok^{1*} and R. Subaraj²

¹*Department of Biological Sciences, National University of Singapore*

14 Science Drive 4, Singapore 117543, Republic of Singapore

²*Blk 127 Tampines Street 11, #09-444, Singapore 521127, Republic of Singapore*

(* Corresponding author: dbsloks@nus.edu.sg)

INTRODUCTION

The family Charadriidae (plovers) belongs to the order Charadriiformes and suborder Charadrii (Piersma & Wiersma, 1996). This family is further divided into three subfamilies—the Vanellinae (lapwings), Pluvianellinae (magellanic plovers) and Charadriinae (plovers). The lapwings consist of two genera—*Vanellus*, and *Erythrogonys* which consist of 25 species collectively. In Singapore, two species of lapwing have been recorded—the red-wattled lapwing (*Vanellus indicus*) (Fig. 1) and the grey-headed lapwing (*Vanellus cinereus*) (Fig. 2). The red-wattled lapwing is listed as a rare resident by Wang & Hails (2007) and is listed as locally endangered (Lim et. al., 2008), while the grey-headed lapwing which was recorded three times in Singapore, but was omitted by Wang & Hails (2007), is regarded by other authorities as a vagrant or rare winter visitor to Singapore (Lim & Gardner, 1997; Jeyarajasingam & Pearson, 1999; Wells, 1999; Robson, 2005).

Lapwings, like all plovers, are obligate visual foragers, meaning they catch their prey at the substrate boundary layers, by picking small invertebrates from the surface or from low vegetation cover (Piersma & Wiersma, 1996). Although the bills of lapwings do show quite high densities of touch receptors, known as the Herbert Corpucles, they are not arranged



Fig. 1. A red-wattled lapwing (*Vanellus indicus atronuchalis*) seen on open ground at the Western Catchment Area. (Photograph by: Alvin Francis Lok Siew Loon).



Fig. 2. A grey-headed lapwing (*Vanellus cinereus*) seen at Sungei Balang, Johore, Malaysia. (Photograph by: Soh Guan Swee).



Fig. 3. A red-wattled lapwing (*Vanellus indicus atronuchalis*) showing its comparatively rounded wings. (Photograph by: Lee Tiah Khee).



Fig. 4. A red-wattled lapwing (*Vanellus indicus aigneri*) in Baghdad, Iraq. (Photograph by: Matt Pike).

in complicated arrangements like those found in probe-feeding, scolopacid waders. Because of the visual hunting style of lapwings and other plovers, their optic lobes are twice those of probe-feeding sandpipers. In earlier classifications of the Charadriidae, the width of the bone between the eyes was used as a critical character, as well as the size of the area of the forehead, where the paired salt-glands are sited. As lapwings tend to frequent freshwater habitats, their salt-excreting glands are rather small.

Lapwings also possess many features that set them apart from other plovers, such as the presence of a crest, facial wattles or spot wing spurs, which are usually more prominent in males than in females (Piersma & Wiersma, 1996). Lapwings are also distinct from other plovers in that they have rounded (Fig. 3) rather than pointed wings. This is important in lapwings as rounded wings allow for more manoeuvrability for display purposes during courtship or during mobbing of a predator. This is in contrast to the sharply pointed wings of other plovers which allow flight to be rapid and energetically cheap, which is important for migrating birds. Also because of their large size in comparison with other plovers, lapwings do not show much crypsis, and as a result tend to advertise their presence instead of trying to hide. Lapwings also rarely sit or stand on trees or bushes as they are unable to grasp branches owing to their lack of toes.

There are four known subspecies of red-wattled lapwing—*Vanellus indicus aigneri* from southeast Turkey, Iraq, Iran, eastern Arabia, and Pakistan, *Vanellus indicus indicus* from east Pakistan, India, Nepal and Bangladesh, *Vanellus indicus lankae* from Sri Lanka, and *Vanellus indicus atronuchalis* from northeast India, Myanmar through Vietnam and south to Peninsular Malaysia, and Singapore (Piersma & Wiersma, 1996). *Vanellus indicus aigneri*, *Vanellus indicus indicus*, and *Vanellus indicus lankae* generally possess a black breast, forehead lores, crown, and a thin strip down the middle of the nape, white ear-coverts connected to the white collar and breast, bright orangey-red, small wattles, and bill with a black tip, long yellow legs, and greyish brown wing coverts, scapulars, tertials and back (Fig. 4). The subspecies *Vanellus indicus atronuchalis* occurring here, is distinct from all the other three subspecies by having a more slender, white hindneck collar and patch on the ear-coverts that is isolated from the white breast (Fig. 1). The other two subspecies are very similar to the nominate subspecies, differing in size and iridescence of their plumage, with *Vanellus indicus aigneri* being the largest and palest, and *Vanellus indicus lankae* being the smallest, darkest, and glossiest.

The grey-headed lapwing is found from northeast China, neighbouring parts of Russia, Japan, central Manchuria and Mongolia (Piersma & Wiersma, 1996). It is non-breeding in South Asia from Nepal, Bangladesh, northeast India, south central China, north Indochina, and Taiwan, and occasionally further south the Malay Peninsula where they have turned up on Penang, Kuala Gula coast (Perak), Sungei Way (Selangor) as well as in Singapore. The grey-headed lapwing is



Fig. 5. A red-wattled lapwing (*Vanellus indicus atronuchalis*) nest with a chick and an unhatched egg (Photographed by: Jonathan Cheah Weng Kwong).

the largest lapwing in our region, and it has a grey head, neck and upper breast, a black-streaked breast band, brown upper-parts, white belly, yellow legs and bill tipped with black (Fig. 2).

The red-wattled lapwing is normally found in lowlands, but can be found as high up as 1,800 m (Piersma & Wiersma, 1996). They frequent open areas near fresh or brackish water such as rivers, mud banks, marshy grasslands, open forest with sporadic clearings, grassy fields, wasteland and dry gravelly ground with grass patches. In the Malay Peninsula, cattle and water buffalo grazing pastures interspersed with wallows and marshes are the most frequently used habitats (Wells, 1999). This is especially true because the cattle and water buffalo dung supports invertebrate life which is utilised as a convenient food source and also because the presence of these large ruminant animals keep the grass low, allowing the birds to look out for approaching danger. Low-lying golf courses, secure corners of grassy airfields, short-grass beach habitats, and single-cropped, paddyland where pesticides are not heavily used are also important. The grey-headed lapwing, alternatively, prefers more undisturbed habitats such as marshes and swamps as well as river banks.

Both the red-wattled and grey-headed lapwings are monogamous, solitary and highly territorial breeders (Piersma & Wiersma, 1996), with only the red-wattled lapwing breeding in here. The grey-headed lapwings generally nest in undisturbed wetlands, which consist of a scrape that is lined with twigs and usually have a clutch of 3–4 eggs (Piersma & Wiersma, 1996). The eggs of both species are glossless, stone-brown to pale olive-brown, marked with irregular blotches of lavender and dark brown, which are densest over the broader end (Fig. 5). The red-wattled lapwing also has a similar nest to the grey-headed lapwing. The nests are also scrapes that are unlined or lined with small stones or debris, and more often situated near water. Lapwings usually have their nest situated away from visual obstructions so giving the nesting birds an all round field of vision. Once hatched, the chick quickly leaves the nest and is fully mobile, foraging for food around the nest site. In Malaysia, red-wattled lapwings nests have been found in Pulau Langkawi, Penor (Pahang), and Sungei Balang (Johore), while in Singapore, nests have been regularly observed in grassland near Poyan and Tengeh Reservoirs, Tuas and once at Sungei Buloh Wetland Reserve. Nesting of the red-wattled lapwings is recorded from our region from Feb. through to Aug.

Currently the red-wattled lapwing is not globally threatened with a strong world population that occupies a variety of niches and is also able to tolerate areas which are densely-populated with humans (Piersma & Wiersma, 1996). The grey-headed lapwing contrastingly, is globally near-threatened with numbers decreasing owing to problems with pesticides and herbicides, increased urbanisation, and double-cropping of field where they tend to nest, making the previously single-cropped nesting sites unavailable.

The red-wattled lapwing is a very noisy bird that is even heard at night (Hayman et. al., 1986). The usual call is a rhythmic “did-he-do-it” or a “kree-dee-der”. The mobbing call is an incessant, sharp, repeated “trint-trint-trint”, usually given in flight. The grey-headed lapwing alternatively, is not a very vocal bird which has a plaintive “chee-it” contact call and when disturbed or agitated, has a rasping “cha-ha-eet” and sharp “pink” call.

PAST AND PRESENT RECORDS

Previously, the red-wattled lapwing was considered extremely rare in Singapore and was described as an occasional winter visitor (Gibson-Hill, 1950). Red-wattled lapwings were first recorded at in a swampy valley behind the Tanglin Barracks on 21 Nov.1879, with sporadic reports since. On 23 Mar.1985 one bird was spotted at Senoko by Hails (1988) and since then, more sightings were made at Poyan Reservoir in 1993, 13 Jul.1997 and 29 Jan.1998, at Tuas grassland from 9–30 Jul.1999 and two birds at Kranji Marsh on 15 Aug.2001 (Wang & Hails, 2007). In the East, red-wattled lapwings were first reported from Pulau Tekong on 5 Mar.2003 and on Pulau Ubin on 4 May.2005.

Today the red-wattled lapwing population is estimated in the low one hundreds (Yong, 2008) with two main local populations of red-wattled lapwings in Singapore—the western and eastern populations (Fig. 6). The western population seems to have originated from earlier reports of birds from the Poyan Reservoir area and now they have been spotted in larger numbers and with much regularity. In the West, we have observed populations from the Tuas wetlands close to the Raffles Marina, and Tengeh Reservoir area, especially at several open grassy patches adjacent to the reservoir (Figs. 7 & 8), on the coastal dyke adjacent to the Poyan Reservoir (Fig. 9), in a swampy channel between Poyan and Murai Reservoirs (Fig. 10), and inland towards the Muslim Cemetery at Lim Chu Kang, Murai Reservoir, Sarimbun Reservoir, Sungei Buloh Wetland Reserve, the vacant agricultural land in the Lim Chu Kang agricultural park, Kranji-Neo Tiew Road area, and lately, a number have been spotted at the Singapore Armed Forces (SAF) training area adjacent to Old Jurong Road. In the East, we have observed them on Pulau Ubin, Pulau Tekong, and the reclaimed land at Changi Cove, as well as in the Serangoon area (grasslands near the Lorong Halus ponds) in the north, and the marshy area near the Jelutong Tower at the western end of MacRitchie Reservoir. The Serangoon, and MacRitchie Reservoir sightings are believed to be those of migrant birds because they were observed during the migration season, while the birds at Changi Cove could be either migrant or resident birds that have flown over from the adjacent Pulau Tekong population.

Lim & Gardner (1997) described the red-wattled lapwing as a rare non-breeding visitor. However, this status no longer applies in recent years as there have been several breeding records, and individuals are also present outside winter. Wang & Hails (2007) have reported chicks in Feb.2003 and another three chicks in Apr. and May 2003 at Poyan Reservoir. In 2003, nesting was at Tengeh Reservoir was also observed when an adult charged the vehicle with wings outstretched, while a small black chick was seen retreating into the safety of the trackside grass. More recent nesting was observed at Sungei Buloh Wetland Reserve in Jun.2008 (Lee, 2008). Three eggs were observed from this clutch and the nest consisted of a scrape in the ground lined with debris and bits of twigs (Fig. 11). A few days later only two eggs remained in the nest (Fig. 12) and finally all the eggs were found missing, probably predated. On 21 Dec.2007, Tsang & Wang (2008) reported a red-wattled lapwing nest made on a platform on a small grass patch surrounded by water. This clutch had a total of four eggs. However, on the 28 Dec.2007, two eggs were found missing from the nest and thought to be predated by a snake. On 6 Jan.2008 the two remaining were also found to be missing from the nest, and on closer inspection, all four eggs were found to have been rolled off the nest with one egg broken. Other signs of unconfirmed breeding were observed in Mar.2008 at a grassy clearing close to Tengeh Reservoir, when few pairs individually displayed unusual aggressive behaviour; charging at the vehicle with their wings spread and repeatedly calling “trint-trint-trint” then taking flight and aerially mobbing the vehicle. This is the typical behaviour of red-wattled lapwings here. They are extremely skittish, and are very difficult to approach, taking to flight about 50 m away while making rhythmic “kree-dee-der” calls.

The grey-headed lapwing alternatively, is a vagrant or rare winter migrant to Singapore and has therefore only been recorded three times in the past (Fig. 6), with all records being made by Richard Ollington in his personal bulletin, “Birdline Singapore”. Wang & Hails (2007) chose to consider the species as unconfirmed owing to a lack of photographs or notes and as such, this species was listed under the Doubtful/Unconfirmed category. Ironically, the first record of this species was made at north Kranji (this was mistakenly stated as Senoko in some reports) on 15 Sep.1981 and was accepted by the then bird group led by Hugh Buck and bird recorder, Christopher Hails (R. Ollington, pers. comm.) and this species was listed in the pocket checklists of the Nature Society of Singapore (NSS) bird group. Richard Ollington then made two other sightings of this rare winter visitor again on 9 Nov.1993 at south Kranji and on 11 Mar.1997 at Tuas roosting with Pacific golden plovers (R. Ollington, pers. Comm.). Both the 15 Sep.1981 (north Kranji) and 9 Nov.1993 (south Kranji) records for the grey-headed lapwing in Singapore by Richard Ollington were also accepted by Wells (1999).

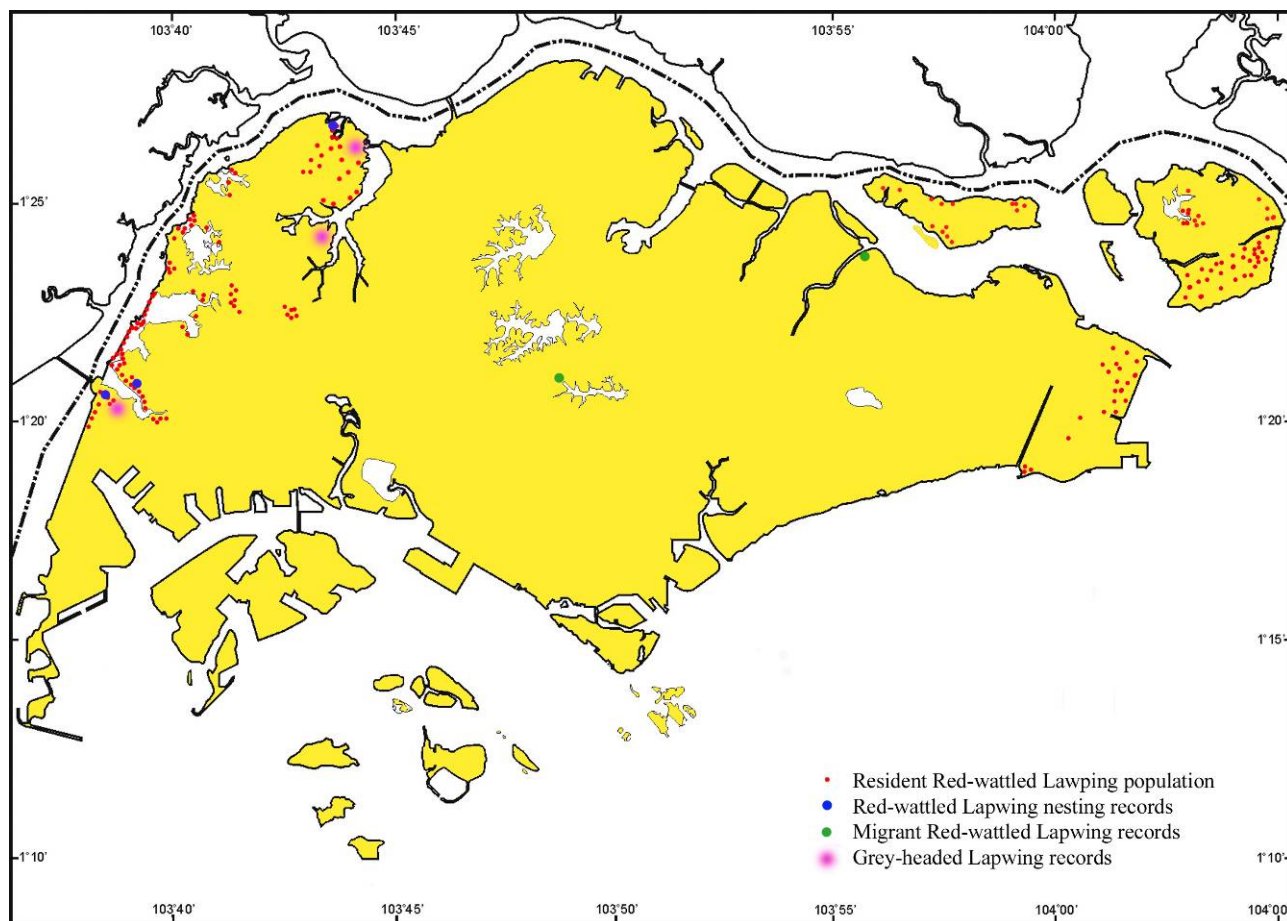


Fig. 6. Map showing the distribution records of the red-wattled and grey-headed lapwings in Singapore from the authors' personal observations.



Fig. 7. A open sandy grassy patch adjacent to Tengeh Reservoir where red-wattled lapwings were found. (Photograph by: Alvin Francis Lok Siew Loon).



Fig. 8. The third possible nesting site of the red-wattled lapwings adjacent to Tengeh Reservoir. (Photograph by: Alvin Francis Lok Siew Loon).



Fig. 9. Swampy patches of grass adjacent to the dykes at Poyan Reservoir. (Photograph by: Alvin Francis Lok Siew Loon).



Fig. 10. The freshwater marshy area between the Poyan and Murai Reservoirs. (Photograph by: Alvin Francis Lok Siew Loon).



Fig. 11. A pair of red-wattled lapwings nesting at Sungei Buloh Wetland Reserve. (Photograph by: Lee Tiah Khee).



Fig. 12. A few days later only two eggs remained. (Photograph by: Lee Tiah Khee).

CONCLUSIONS

Although the red-wattled lapwing population in Singapore has increased over the recent years, the increase could be because of winter visiting birds that decided to remain past the winter months and have found suitable habitats to breed. Another possibility could also be because these habitats are now more accessible and more effort is put into studying these birds. At the moment most of the red-wattled lapwing populations and breeding sites are not protected within nature reserves, although most of these sites are awarded some protection as they are confined to SAF training areas which are in danger of being destroyed for development. Having said that, these habitats are also not maintained by the SAF for the well being of the birds and many of these locations are very often used for military exercises, thus displacing the birds for periods of time. The possible nesting site encountered in 2008 where large concentrations of birds were also observed, has also seemingly been abandoned probably because it was overgrown by lalang (*Imperata cylindrica*), making it an unfavourable habitat for lapwings, which have a preference for open habitats where a potential predators can be spotted from a distance. Long grass areas can, on occasion be used, if it is waterlogged, allowing birds to hear approaching danger.

ACKNOWLEDGEMENTS

We would like to thank the Ministry of Defence (MINDEF) and the Public Utilities Board (PUB) for granting us access to the study sites as well as Jonathan Cheah Weng Kwong, Lee Tiah Kee, Matt Pike, and Soh Guan Swee, for providing photographs of these two beautiful lapwing species, and Richard Ollington for sharing with us details of his three grey-headed lapwing sightings. We are also grateful to Lee Li-Kheng who provided the base map for Singapore.

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