An update on the status and distribution of the Knob-billed Duck *Sarkidiornis melanotos* in Sri Lanka, with notes on its behaviour

Bopitiya Gamage Pavan Thilina Saranga, Wijeweera Patabendige Surendi Nisha Wijeweera & Ragupathy Kannan

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Bopitiya Gamage Pavan Thilina Saranga, Meemanage Wattha, Godagama, Matara, Sri Lanka.
Wijeweera Patabendige Surendi Nisha Wijeweera, Department of Zoology, University of Ruhuna, Matara, Sri Lanka.
Ragupathy Kannan, Department of Biology, University of Arkansas–Fort Smith, Arkansas 72913, U.S.A. E-mail: Ragupathy.Kannan@uafs.edu. [Corresponding author.]
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The Knob-billed Duck or African Comb Duck *Sarkidiornis melanotos* was formally described to science from Ceylon (now Sri Lanka) by Pennant (1769: 12). It disappeared and was believed to be extinct from the island by the 1960s (Henry 1998; Harrison & Worfolk 1999). Ali & Ripley (1987: 48) indicated the species as 'Formerly sparse resident in Ceylon.' Carboneras & Kirwan's (2020) global distribution map for the species does not include Sri Lanka. The historical status of the duck in Sri Lanka is dubious and must be interpreted through numerous subjective statements. Legge (1880: 1064) wrote that the bird was 'more common than is generally supposed…' and that it was first described in Ceylon by Forster, 'who erroneously states that it is common in the hills' (ibid.). Legge himself characterized the status of the Comb Duck in the island as '… nowhere numerous, it is found here and there in … the north and east …' (ibid.). Citing Layard, he wrote that it is '… not uncommon on the tanks of the Vanni …' (ibid.). Also citing one 'Mr. Parker' [= H. Parker], (apparently based on Parker 1881, 1883) he wrote that the bird is 'tolerably common, but not plentiful, in the North-western Province and in the Anaradhapura (sic) district …' (ibid.). As for breeding, Legge wrote that one Mr. Fisher found it breeding near Yala (ibid.). The breeding season has been reported as February–March in Sri Lanka (Legge 1880; Henry 1971; Weerathunga et al. 2013). Based on these reports, we surmise that, prior to its disappearance, the species was never common but occasionally nested in the island. Young (2005: 392) indicated in the map that the species occurs in Sri Lanka, although the text (p. 393) says the contrary.

On 18 March 2002, several decades after its disappearance in the 1960s, two Knob-billed Ducks were reported in a waterbody of Vaddukoddai in the Northern Province of Sri Lanka (Bavinck 2002). About a year later, on 20 February 2003, a sighting was reported in Yala National Park of Hambantota District in Southern Province (Ceylon Bird Club 2019). Almost another decade passed before, in 2012, their return to the island was reported in several waterbodies (Weerathunga et al. 2013). Status reports of the species, since then, have been dubious and somewhat contradictory: Warakagoda et al. (2012) wrote that it is a winter migrant in the lowlands of Sri Lanka; Ceylon Bird Club (2020) uncertainly reported that it is a resident (the word "Resident" was followed by a question mark), plus a winter visitor.

Here, we use our birding records, eBird data (www.eBird.org; eBird 2021), and records from Ceylon Bird Club Notes (hereinafter, CBCN), and present a review and update on the species' status and distribution in Sri Lanka post 2002, and provide incidentally observed behavioural notes supported by

Table 1. Distribution of records of Knob-billed Duck in Sri Lanka from the present study

Province	No. of sites surveyed	No. of sites with Knob-billed duck sightings	Frequency (%)	No. of field visits	No. of field visits that recorded the species	Frequency (%)
Western	3	3	100	6	3	50
Southern	16	10	62.5	269	61	22.6
North-Western	4	2	50	8	2	25
Uva	4	2	50	10	2	20
Northern	10	3	30	13	3	23
Eastern	3	1	33.3	6	1	16.6
North-Central	6	1	16.6	10	1	10
Sabaragamuwa	1	0	0	4	0	0
Central	4	0	0	6	0	0
Total	51	22	43	332	73	21.9

photographs. All our records have been uploaded in eBird and we took care to avoid double counting our records that overlapped in eBird. There was no overlap between CBCN and eBird records. We were conservative in our determinations of sightings (species encounters) and numbers. Continuing sightings in the same general area over consecutive or recent days were regarded as a single sighting to avoid possibly repeat counting the same flocks. Also, in the absence of systematic census data, we used maximum numbers seen for each month for a conservative estimate of populations.

We conducted 332 surveys in 51 sites across all nine provinces of Sri Lanka from 2012 to May 2021. Three sites in the Southern Province were surveyed more often than others due to easy access for regular sampling. The sites were Kirala Kele Sanctuary (5.979ºN, 80.513ºE), paddy fields outside of Kirala Kele (5.983ºN, 80.525ºE), and Nilwala wetland–Palatuwa (5.999ºN, 80.5449ºE).

Current distribution

We recorded the species in 73 of the 332 (21.9%) surveys, and at 22 of the 51 (43%) surveyed sites across all provinces in the island, except Central- and Sabaragamuwa Provinces (Table 1; Figure 1A).

The distribution of our records (Fig. 1A) closely agrees with the overall current distribution in eBird (Fig. 1B), although many of our records are yet to appear in eBird's public output since they are pending review. These two maps indicate that the species is now found in coastal areas predominantly in the northern and southern regions of the island. The species avoids the hilly and inland parts of Central-, Sabaragamuwa-, and Uva Provinces, and it is also absent from large areas of the eastern coast.

Current migratory and overall status

Our records and CBCN records, plus other records uploaded in eBird (Fig. 2), indicate that the species is found year-round in Sri Lanka, with some augmentation in winter, presumably from neighbouring India. We cannot attribute much relevance to the increase in our sightings in February and December (Fig. 2) simply because we birded more during those months. Nevertheless, it is clear from Fig. 2 that the species is currently a year-round resident in the island. Maximum numbers seen ranged from three in April to 36 in March (Fig. 2). An overview of sighting frequencies from all eBird records in the country (Fig. 3) reinforces our finding that the species is present infrequently year-round in the island.

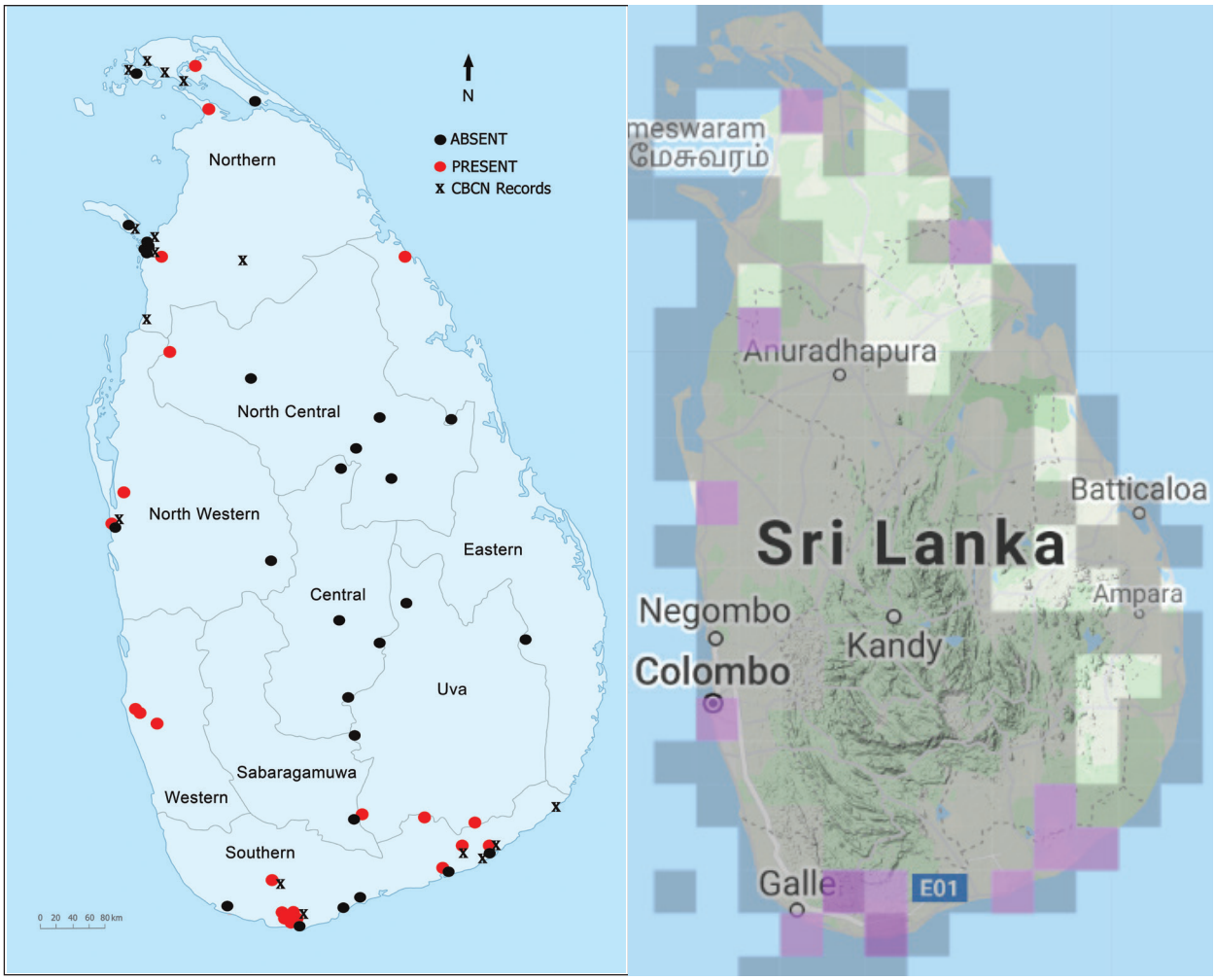

Fig. 1A. Sites surveyed in 2012–2021 (dots) for the Knob-billed Duck, and records from CBCN Notes 2002-2021 (x marks) of the species in Sri Lanka; 1B. Current (2016-2021) distribution of the species in Sri Lanka. Image on right provided from eBird (www.eBird.org) and generated on 13 September 2021.

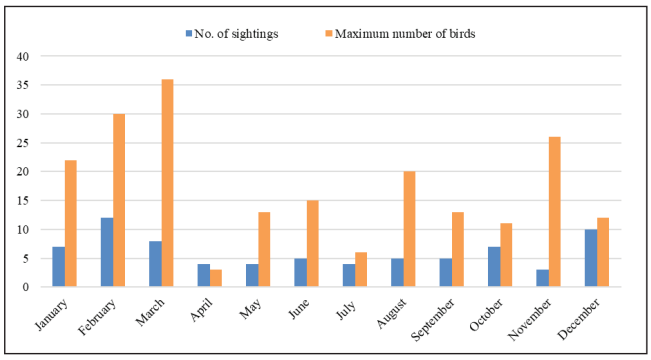

Fig. 2. Temporal distribution of Knob-billed Duck sight records, and their maximum number observed per month in Sri Lanka (2002–May 2021). Data compiled from CBCN Notes (2002–May 2021), eBird (2012-2021) (eBird 2021), and our own records (2012–May 2021).

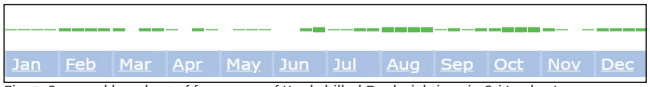

Fig. 3. Seasonal bar chart of frequency of Knob-billed Duck sightings in Sri Lanka. Image generated from eBird (2021) on 28 September 2021 (data from all years, all observers). The higher green bars show periods when the species is least likely to be missed, while the narrower green bars show when species is present but infrequently detected.

Seasonal variation in numbers and frequency in the Southern Province

In Matara District of the Southern Province, the Knob-billed Duck was first reported in the Kirala Kele Sanctuary in 2016 (eBird 2021). Subsequently, birds were recorded every year in the sanctuary. From 2016 to 2018, one or two individuals were reported in eBird from early July in this province. After the middle of July 2018, our own observations indicated that their numbers swelled to a small group. From May 2018 to April 2021, we recorded them in all the months. However, the bird was not recorded during the 29 field trips made in the Southern Province in June (Fig. 4). They now appear to be residents in the area. Numbers across the three sites in the Southern Province seemed to gradually increase, with a peak in February in the second and third years (Fig. 4). Only males were recorded from May 2018 to the first week of August 2020. From the second week of August 2020, females and juveniles were also recorded from these sites.

A seasonal bar chart of frequency (percentage of checklists reporting the species) (Fig. 5) indicates that the species is present in the Matara-Kirala Kele Sanctuary eBird hotspot almost year-round. The frequencies in Kirala Kele ranged from 7.1% in the week starting 08 September, to 75% in the week starting 22 December (eBird 2021; data from all years).

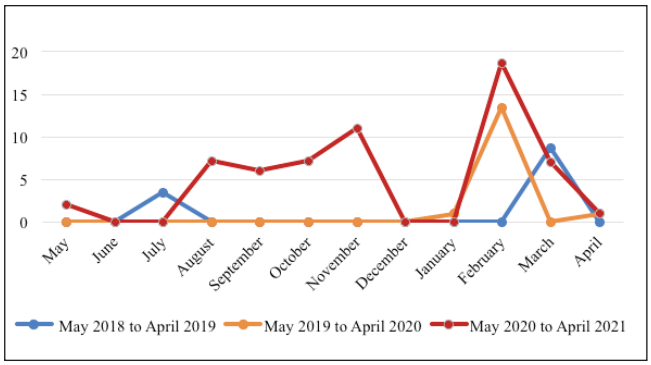

Fig. 4. Mean abundance of Knob-billed Duck over three years (May 2018–April 2021) across three sites surveyed in the Southern Province

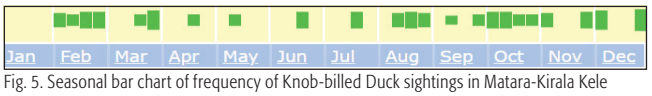

Fig. 5. Seasonal bar chart of frequency of Knob-billed Duck sightings in Matara-Kirala Kele Sanctuary hotspot. Image generated from eBird (2021) on 16 September 2021 (data from all years, all observers). The higher green bars show periods when the species is least likely to be missed, while the narrower green bars show when species is present but infrequently detected.

Behaviour

Out of 288 Knob-billed Duck encounters, sex was determined in 147 individuals during the three years of our study. Some of the 288 sightings could have been repeat encounters with same individuals. Among the 147, 124 (84.3%) were males, and 23 (15.6%) were females. Males were recorded more, yielding a male to female ratio of 5:1. Males and females tended to stay segregated.

Our behavioural observations were done in Kirala Kele Sanctuary. The ducks appeared to feed on newly emerged tender grasses and aquatic plants that grew on the edges of the waterbody. They also, apparently, ate rice grains and other submerged plant matter in the canals of inundated paddy fields. They waded in submerged, harvested paddy patches and pulled rice plants using their beaks, and fed on them. Feeding was followed by prolonged bouts of preening breast and wing feathers. They expanded their wings and showed flapping movements while resting. Preening lasted approximately an hour. In the afternoons they rested in the shade. They moved to reeds and bushes and hid among them. They also tucked their head between the wing and trunk region, apparently to avoid extreme heat. Since sexes stayed segregated, no courtship displays or mating was recorded. Similarly, no nesting or feeding of young was observed. Approximately half the individuals in the population spent nights at the same site by roosting and hiding among reeds. The rest flew elsewhere to roost.

Territorial or "jousting" behaviour was observed only in male Knob-billed Ducks and especially in small groups having four individuals. Pairs of males were observed showing aggressive behaviour. The sequence of photographs, taken on 24 March 2019, begins with both males getting close to each other and bowing low, touching the ground with their bill tips, pointing their knobs at each other **[13A]**. With heads bowed, they puff their feathers and walk around in circles **[13B]**. After making about two circles, one individual rears up, wings flapping, kicking the the opponent **[13C]**. The opponent reacts in turn, kicking and lunging at the aggressor. They peck each other with their beaks. The winner ultimately pushes or mounts the loser **[13D]**. The loser leaves the territory and flees **[13E]**. The entire sequence lasts about a minute, and neither of the individuals appears any worse for wear after the encounter. Finally, if late in the evening, both birds leave the territory together and fly toward their roosting grounds **[13F]**. No inter-specific interactions were recorded although they shared their habitat with Lesser Whistling Duck *Dendrocygna javanica*. This is the first description of antagonistic behaviour of this species from Asia. Considering that the photographs **[13A-F]** were taken in the breeding season (February-March), the behaviour was most likely exhibited by territorial males. The behaviour we observed appears different from the 'head-pumping movement performed while swimming in a very high and erect posture' described by Johnsgard (2010) from Africa.

A

B

C

D

E

F

13. A-F: Aggressive (possibly territorial) behaviour of male Knob-billed Ducks. Photographs by Iroshan Rupasinghe

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The configuration of the tail of the Sri Lanka Spurfowl *Galloperdix bicalcarata* (Galliformes: Phasianidae)

Rajith Dissanayake

Dissanayake, R., 2022. The configuration of the tail of the Sri Lanka Spurfowl *Galloperdix bicalcarata* (Galliformes: Phasianidae). *Indian BIRDS Monograph* 5: 52–56.
Rajith Dissanayake, Department of Science, Birkbeck College, University of London, Malet Street, London WC1E 7HX, U.K. E-mail: rajith@mac.com.
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Birds that are rarely observed or extinct may be painted or drawn in a manner that contradicts their life appearance or deportment. For example, modern scientific restorations of the Dodo *Raphus cucullatus* did not accord with the probable historical appearance of the bird (Dissanayake 2004). Such birds that are difficult to observe in the wild will not generate adequate data worthy of scientific publications, leading to their neglect or extirpation.

Historical South Asian ornithological art tends to depict the tail of the Sri Lankan Spurfowl *Galloperdix bicalcarata* as neatly folded. However, live observations reveal that the tail is largely fanned out rather than folded. Here, I present photographic evidence for the fanned-out tail of this species. I highlight limitations in depictions of the birds based on inert specimens, compared to life observations, and the variance between artists who have not studied live birds compared to those who have.

The Sri Lanka Spurfowl is an elusive Sri Lanka endemic confined to an endemic bird area, and biodiversity hotspot (del Hoyo et al. 1994; Stattersfield et al. 1998). The difficulty in observing this species is almost legendary. Only now, as its habitat is shrinking, is it gaining more photographic traction. Adequate film or photographic footage is still limited or restricted.

From the field, Legge (1880: 742) described: "one of the shiest [sic] birds in the island …". Lushington (1950: 89) stated, "The Spur–Fowl shares the honours with the Ceylon Crow–Pheasant [*Centropus chlororhynchos*] as the Island's shyest bird. It is rarely seen, … Besides being shy … very difficult bird to flush …". "Strictly a forest bird, … shy and wary …" stated Henry (1971: 259). Fleming (1977: 2) described a female, "When she spotted us observing her, she lunged suddenly and violently into the nearest cover … We knew spurfowl would be hard to see but had not realized how violently they react to being seen." De Silva Wijeyeratne's (2019) "… often heard but hardly ever seen …" frames a prevailing consensus. It is a bird that actively avoids being seen, even in captivity (Suthard & Allen 1964).

Recent observations of this spurfowl offer insightful discrepancies between artistic depictions as opposed to life observations. Such observations may not be very important but are mentioned regularly (Gallagher 2005). With regards to Indian palm squirrels (*Funambulus* sp.), Blyth (1847: 874) described a coloured plate of taxon under discussion from Leach (1814): "Leach's figure of *penicillatus* is execrable, and separation characters most unsatisfactory", a harsh but proper critique for taxonomic diagnosis. However, practically every other description in Henry & Wait (1927–1935) offers somewhat petty criticisms of comparative plates in the earlier monumental work by Legge (1880): [Dusky Flycatcher] "In Legge's figure … the colouring of the forehead is not sufficiently bright and the general shape is not correct." New and undocumented plumage features often crop up (De Mel et al. 2014). The discrepancies indicated here do not concern colouration but configuration. This work arises from a familiarity with illustrations of the spurfowl from historical references and contemporary field guides including del Hoyo et al. (1994), and a relatively unknown Suthard & Allen (1964). Pre-1921 plates of the bird are indicated in **[14]**, including the first detailed studies (Gould 1850–1883: plate 67 (1854); Legge 1880: plate 33; Baker 1920). Although missed from Henry & Wait (1927–1935), Henry (1955) produced a plate complemented by another in Suthard & Allen (1964). Several field guides yield modern depictions excluding photographic guides (Kotagama & Fernando 1994: plate 8; Harrison 2011: plate 14; Rasmussen & Anderton 2012: plate 41; Warakagoda et al. 2012: plate 2). Furthermore, the plate of the male Sri Lanka Spurfowl in del Hoyo et al. (1994: plate 51) has the same profile as a more generic species in a companion volume (Winkler et al. 2015: 53). Alternative editions of many of these works duplicate the same plates, e.g., the Warakagoda et al. (2012) spurfowl is reproduced in Grimmett et al. (2014).

I obtained several minutes of film and photographs of the spurfowl. Precise locations are not given here to safeguard the