Incubation and nest-defence behaviour of Streaky-breasted Flufftail *Sarothrura boehmi* in Zambia

Gabriel A. Jamie[a], Collins Moya[b] and Lazaro Hamusikili[b]

Incubation et défense du nid chez le Râle de Böhm *Sarothrura boehmi* en Zambie. Nous présentons les premières observations dans la nature du comportement de nidification du Râle de Böhm *Sarothrura boehmi*. À l'aide d'un piège photographique, un nid contenant quatre œufs a été suivi pendant quatre jours dans la zone de Choma, Zambie du sud. Le mâle couvait presque toute la journée, la femelle en fin d'après-midi ou le soir et pendant la nuit. Au cours de la troisième nuit, le nid fut pillé par un Serpent mangeur d'œufs *Dasypeltis scabra*, qui a mangé tous les œufs. La défense du nid par la femelle en réponse à l'attaque du serpent est décrite, ainsi que le comportement du couple près du nid après la prédation. Des séquences vidéo illustrant les différents comportements ont été postées sur internet (https://www.youtube.com/watch?v=e7j4kH5Iz4w&feature=youtu.be et suivants).

Summary. We report the first observations from the wild of the nesting behaviour of Streaky-breasted Flufftail *Sarothrura boehmi*. Using a trail camera we monitored a nest containing four eggs over four days in the Choma area of southern Zambia. The male incubated during most daylight hours and the female in the late afternoon / evening and at night. On the third night a Common Egg-eater *Dasypeltis scabra* robbed the nest, eating all of the eggs. We describe the nest defence of the female flufftail in response to the snake's attack, and the birds' behaviour around the nest following predation.

Streaky-breasted Flufftail *Sarothrura boehmi* is an elusive and poorly known inhabitant of seasonally flooded grasslands in central and southern Africa, whose local abundance fluctuates markedly between years in response to rainfall (Taylor & van Perlo 1998). Shortly after periods of heavy rain, the species can suddenly become quite common in suitable habitat and its presence is best detected by the male's deep, repetitive hooting call (Taylor & van Perlo 1998). Very little is known concerning its breeding biology in the wild and all previous observations of the species' social and sexual behaviour refer to captive birds (Taylor & van Perlo 1998, Tarboton 2011). In Zambia the species is considered to be a migrant, with most records in January–March (Dowsett *et al*. 2008).

On 24 February 2015, while conducting bird research at Musumanene Farm in the Choma District of Zambia's Southern Province, GAJ & CM were shown a Streaky-breasted Flufftail nest, found by LH, in a seasonally flooded grassland—a 'dambo'—fringed by miombo woodland (16°47'59.1"S 26°54'15.7"E). The nest was sited near the centre of the dambo (Fig. 1), where the water was *c*.10 cm deep. The nest was constructed from the surrounding, living grass, which had been drawn together to form loose 'walls' on all sides. The grass was gently bent over on top to form a thin 'roof'. The centre of the nest was a smooth, shallow basin of dead grass stems in which were four, all-white eggs (Fig. 2). Their dimensions were not measured; however, these are already well known from both captive and wild birds (Taylor & van Perlo 1998, Tarboton 2011). Nest design is consistent with previous reports (Taylor & van Perlo 1998, Tarboton 2011).

Given how poorly known the breeding biology of Streaky-breasted Flufftail (and most other flufftail species) is in the wild, GAJ & CM decided to deploy a trail camera (a Browning Strike Force camera set to motion-activated mode) to record nesting behaviour. We made a slight partition on one side of the nest and enlarged a pre-existing gap in the grass to provide a clearer view of the nest for the camera, but were careful to minimise disturbance to the surrounding vegetation.

To download camera footage, GAJ & CM returned on 26 February, when four eggs were still present, and again on 28 February, when they found the nest to be empty. These visits were necessary to ensure that the equipment had not been stolen and was functioning properly. The trail camera footage revealed the following.

Nest maintenance and incubation behaviour

The male incubated the eggs for much of the day and changed with the female in the late afternoon / early evening (the switch occurred between 16.34 hrs and 16.39 hrs on 24 February and between

Figure 1. The dambo in which the Streaky-breasted Flufftail *Sarothrura boehmi* nest was found, Choma District, Southern Province, Zambia, February 2015 (Gabriel Jamie)

Le dembo dans lequel se trouvait le nid du Râle de Böhm *Sarothrura boehmi*, District de Choma, Southern Province, Zambie, février 2015 (Gabriel Jamie)

Figure 2. Streaky-breasted Flufftail *Sarothrura boehmi* nest, Choma District, Southern Province, Zambia, 24 February 2015 (Gabriel Jamie). The grass on the near side has been temporarily parted to permit the eggs to be seen.

Nid du Râle de Böhm *Sarothrura boehmi*, District de Choma, Southern Province, Zambie, 24 février 2015 (Gabriel Jamie). L'herbe autour du nid a été temporairement dégagée afin de permettre de voir les œufs.

16.48 and 19.06 hrs on 26 February, with sunset at approximately 18.30 hrs). The female then incubated for the entire night. This matches observations of captive birds (Taylor & van Perlo 1998, Tarboton 2011). The male performed egg rolling once, in which he lifted one egg over the top of the others before letting it rest on the other side of the nest (https://www.youtube.com/watch?v=e7j4kH5Iz4w&feature=youtu.be). The male also performed nest maintenance, pulling at grass beside the nest, and returning with additional grass to line it (https://www.youtube.com/watch?v=cF0SgV227xU&feature=youtu.be). The female was not seen to undertake any of these behaviours.

Nest defence against snake predation

During the night of 26 February, a Common Egg-eater *Dasypeltis scabra* snake visited the nest three times within a period of slightly more than one hour, consuming all of the eggs. The predation event commenced at 19.06 hrs, in response to which the female flufftail adopted a threat posture—hunched forward and raising her wings on either side to present the upper surface

Figure 3. Male Streaky-breasted Flufftail *Sarothrura boehmi* in front of the nest, Choma District, Southern Province, Zambia, 24 February 2015 (Gabriel Jamie & Collins Moya)

Râle de Böhm *Sarothrura boehmi* mâle devant le nid, District de Choma, Southern Province, Zambie, 24 février 2015 (Gabriel Jamie & Collins Moya)

towards the snake, perhaps to make herself look larger. The wings were fanned in and out slightly as the snake moved towards the nest (https://www.youtube.com/watch?v=rG9UWTh7d2E). At 19.09 hrs, the snake could be seen with an egg in its throat before moving away (https://www.youtube.com/watch?v=yjvtEvgzc64). At 19.23 hrs the female flufftail was back on the nest, presumably incubating the remaining eggs.

At 19.35 hrs the snake returned and the female flufftail left the nest. This time the female did not perform any wing-stretching, but attacked the snake, pecking at it vigorously (https://www.youtube.com/watch?v=Pz0OKRmxl10). At 19.54 hrs the female had returned to the nest and there was no sign of the snake.

At 20.12 hrs the snake returned for a third time and the female flufftail again struck the snake with her bill. The flufftail's attacks were even more vigorous than during the snake's second visit.

Adult behaviour at the nest following predation

Both male and female briefly returned to the nest in the morning following the attack, inspected it for *c.*4 minutes (08.28–08.32 hrs) (https://www.youtube.com/watch?v=RhtbZt4fIDE&feature=youtu.be) and then left the area within a few minutes of each other. The camera was left in place until the afternoon of 29 February (2.5 days after the attack), but recorded no further material, suggesting that the nest was abandoned.

Vocalisations around nest

We heard Streaky-breasted Flufftail singing close to the nest when we visited the site on 24 and 26 February. On both occasions, the low hoots were only repeated a few times and were perhaps made by the male who had been disturbed while incubating by our arrival. When GAJ removed the camera on 29 February, he heard a Streaky-breasted Flufftail giving the full song, consisting of a long series of low hoots, from an area nearby (although it is notoriously difficult for a single observer to judge their distance from a calling flufftail). It is possible that this was the same male recorded by the trail camera and which was now either advertising again for a female or re-establishing its territory.

In captivity, male Streaky-breasted Flufftails are known to continue singing even after incubation has commenced (Taylor & van Perlo 1998); it is therefore unsurprising that partial song was heard during the incubation period in the wild.

Discussion

The flufftail bred in a good year for the species locally. GAJ had not heard Streaky-breasted Flufftail vocalising at the site on either of his two previous field seasons there in the rains, whereas in 2015 several individuals were also heard in adjacent dambos.

To our knowledge, this is the first time that wing-stretch posturing and active attacks in response to a nest predator have been reported by flufftails (or potentially any other rallid). In Taylor

& van Perlo (1998) the only responses listed from rallids to terrestrial predators are jumping, escape and silent following of the threat. That the snake was predating the flufftail's eggs rather than the birds may have meant that, rather than escaping, the flufftail was able to risk attacking the snake without placing itself in danger. Additionally this snake species is unlikely to present any danger to the flufftail as it is non-venomous and feeds exclusively on eggs (Spawls *et al*. 2004).

In general, observations of this pair are consistent with findings from captive birds concerning incubation (male by day, female at night) and nest maintenance / construction (male-only) behaviour (Taylor & van Perlo 1998, Taylor & Kirwan 2013).

Acknowledgements

We thank Claire Spottiswoode for commenting on an earlier draft of the manuscript, Stephen Spawls for confirming the identification of the snake, and Troy & Elizabeth Nicolle for permitting us to conduct field work on their farm. Pete Leonard is thanked for reviewing the submitted version of this note. Our field work in Zambia was supported by a Research Project Grant from The Leverhulme Trust.

References

Dowsett, R. J., Aspinwall, D. R. & Dowsett-Lemaire, F. 2008. *The Birds of Zambia: An Atlas and Handbook*. Liège: Tauraco Press & Aves.

Spawls, S., Howell, K., Drewes, R. & Ashe, J. 2004. *A Field Guide to the Reptiles of East Africa*. London, UK: Christopher Helm.

Tarboton, W. 2011. *Roberts—Nests and Eggs of Southern African Birds*. Cape Town: Trustees of the John Voelcker Bird Book Fund / Jacana Media.

Taylor, B. & Kirwan, G. M. 2013. Streaky-breasted Flufftail *Sarothrura boehmi*. In del Hoyo, J., Elliott, A., Sargatal, J., Christie, D. A. & de Juana, E. (eds.) *Handbook of the Birds of the World Alive*. Barcelona: Lynx Edicions. www.hbw.com/node/53573 (accessed 15 November 2015).

Taylor, B. & van Perlo, B. 1998. *Rails: A Guide to the Rails, Crakes, Gallinules and Coots of the World*. Robertsbridge: Pica Press.

[a] *Department of Zoology, University of Cambridge, Downing Street, Cambridge CB2 3EJ, UK. E-mail: gaj29@cam.ac.uk*

[b] *Musumanene Farm, PO Box 630303, Choma, Zambia.*

Received 20 November 2015; revision accepted 10 December 2015.