What's eating Black Harriers *Circus maurus*? Two predation events camera-recorded on a ground nesting raptor

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Introduction

The Black Harrier *Circus maurus* is southern Africa's rarest endemic raptor (Simmons et al. 2005) and will be listed in South Africa to IUCN conservation category 'Endangered', due mostly to the loss and fragmentation of breeding habitat such as lowland Renosterveld (Curtis et al. 2004). The species is also known to suffer seriously low levels of genetic variation (Fuchs et al. 2013) and may be at risk in adapting to climate change if future conditions are too severe. Locally wind turbines may also pose a threat to this species (Simmons et al. 2011). Considered a Fynbos breeding near-endemic, encounters with this species are special whenever they occur. The Black Harrier nests on the ground, and is thus especially vulnerable to a suite of potential predators – from rats to leopards – yet there is nothing published on predation events at Black Harrier nests. Here we describe two such events.

Results

First nest

During avian surveys conducted during 2013 on the western edge of Baviaanskloof Nature Reserve (33.443°S, 23.547°E), Eastern Cape, regular encounters with Black Harriers led ATKL to suspect the presence of a breeding pair of Black Harriers at a valley site where renosterveld, Karoo, and mountain Fynbos interfaced. The valley, associated with an annual watercourse, is dominated by the straggly shrub *Stoebe burchellii* and sedge. On one occasion the pair of harriers was observed perched on the ground, while two Cape Grey Mongooses *Galerella pulverulenta* foraged within 15 m of the birds – but with no inter-specific interaction.

On 13 September 2013 at 09h00 a Black Harrier was flushed off a nest site containing four eggs in the same area. Vegetation around the nest was dominated by sedge (possibly *Scirpoides* sp. up to 1 m tall) for about a 4 m radius, and then mixed grass and *Stoebe burchellii* bushes up to 2 m tall. The nest was located about 25 m from a seep area, which is typical for this species in arid areas (Simmons et al. 2005).

To determine what this pair were eating and record events at the nest, one of the few known from the Eastern Cape, a small infra-red Bushnell Scoutpro heat sensor camera was installed on the 19 September 2013 about 3m from the nest, and mounted on a pole. It was set on video mode at low sensitivity (to minimise disturbances from the sensor at night). There were only two eggs left on the date of installation. The shells from the other eggs were still in the nest, but no chicks were present, suggesting the eggs had been depredated. The camera captured three days worth of video footage, before the 2Gb memory card was full (due to the

large file size). Analysis of the video footage showed the female harrier mostly brooding and rearranging small branches in the nest. That she accepted the camera encouraged us to continue using photographs only.

Figure 1. a) A female Black Harrier recorded leaving the nest site in the Baviaanskloof Nature Reserve with a prey item, while a single chick (c. 3 weeks) and two eggs are present in the nest. This indicates the condition of the chick the day it was ringed (26 October 2013; 15:55:02); **b)** An African Wildcat recorded with the Black Harrier chick (5 November 2013; 01:10:10); **c)** Small Grey Mongoose recorded at the nest site, after which no eggs were present (7 November 2013; 12:31:19); **d)** The tail of a Cape Genet can be made out leaving the site of the depredated nest in the Kammanassie. Images before and after this image suggest the Genet removed the carcass of the remaining dead chick (6 December 2013; 20:48:41).

On 19 October a visit to the nest revealed one chick, with age estimated at one week, placing the hatching of the chick at about 12 October 2013. At this time there were two intact eggs in the nest, suggesting at least one had been laid during the month. Camera settings were changed to take photos at normal sensitivity and file size, increasing the storage ability of the camera.

On 26 October 2013 the chick was ringed by RS. The two eggs remained unhatched. The chick was judged to be in good condition and based on tarsus width and length it was suspected that the chick was male (Figure 1a). The bird was gaining it flight feathers but at this stage it was not creating runnels around the nest, and still required parental attention in the form of feeding and some sheltering during adverse weather.

The camera was then retrieved on 29 November 2013, just over a month later. At this time it was clear the nest had been abandoned for some time as reeds were growing through the nest, and there were no signs of chicks or recent activity (e.g. fresh pellets at perch sites). The camera revealed the presence of an African Wildcat *Felis silvestris lybica* at the chick's last location at 01h10 on 5 November 2013 (Figure 1b). The chick was recorded alive in a photo 40 minutes earlier. Subsequent photos revealed the corpse at the edge of the nest over the next couple of days. The female harrier was observed moving the remaining eggs in the nest in one photo, but on 7 November 2013 a Cape Grey Mongoose was observed at 12h31 and again at 15h50 at which stage no further eggs remained in the nest (Figure 1c). The last photo of the Black Harrier at the nest was at 17h54 after which the nest remained abandoned. Further photos of the development of the chick and the predation event are available at: http://bluehillescape.blogspot.com/2013/11/prince-harry-killed-by-african-wildcat.html and http://bluehillescape.blogspot.com/2013/10/the-secret-life-of-black-harriers-first.html

Second nest

A visit to the location of a second nest in the Kammanassie mountain range (33.659^{o}S, 22.762^{o}E), Western Cape, was conducted on 6 December 2013, in conjunction with Mark Brown and CapeNature staff. The nest had been located approximately a month earlier with two chicks, reported to be in good condition by CapeNature ranger Johnny Witbooi, although no interim visits had been conducted. This nest was located in mature, moist Fynbos dominated by *Berzilia* sp., *Erica* sp. and Restionaceae, generally over 1.5 metres tall, on a south-facing slope.

On arrival at the nest site at around 09h00, it was clear the chicks had been killed perhaps only a few hours earlier as blood was fresh, there was liquid in the eyes, and there were few beetles or flies on the corpses. The chicks were large, perhaps only a week or two from fledging. Puncture wounds to the throat of the body of the one chick remaining in the nest were large (c.3 mm diameter), a leg was removed and bones in the wing were broken. Only one wing remained of the second chick suggesting a predator larger than a mongoose, or even a wildcat. Tracks of Honey Badger *Mellivora capensis capensis* were located emerging onto a jeep track about 40 m from the nest site. These tracks continued down the jeep track, where a second harrier wing was located. Honey Badgers are omnivorous and known to take eggs and birds - they devour all parts of their prey, including skin, hair, feathers, flesh and bones (Rosevear 1974). While evidence that the depredation of the harrier chicks was enacted by Honey Badger, that the initial predation was undertaken by Caracal *Caracal caracal* cannot be ruled out completely.

A Bushnell Scoutpro camera trap was installed to observe the nest for the next 24 hours. Although an adult harrier had been present in the vicinity of the nest at the time of the arrival of the research crew, no visits to the nest were recorded by the camera. At 20h48 the tail of a Cape Genet *Genetta tigrina* was photographed at the nest and the body of the second chick was no longer evident, suggesting the genet had scavenged what remained (Figure 1d). No further activity was recorded at the nest. It is not thought that the genet was the cause of the original predation event as the chicks were of a size capable of defending themselves against smaller members of the mustelid family (Cape Genet 1.8 kg, Honey Badger 5-16 kg), and the damage to the bodies was inconsistent with that capable by a genet. Genet tracks were located in the vicinity of the nest only on the second day. Genets are opportunistic omnivores known to eat birds, but their diet consists mostly of insects (Roberts et al. 2007).

Conclusion

During the course of 14 years monitoring, only 2 adult female Black Harriers are known to have succumbed to predators (remains found at the nest), yet many nests with chicks fail, particularly those in mountainous areas (Simmons et al. 2005). Understanding what causes nests failure for most avian species is often a mixture of guess work and luck. The advent of easily installed remote cameras which are small enough to be accepted by the species involved has allowed us a better understanding of the causes of nest failure. The results reported here and the recording of cannibalism by a small GoPro camera by Claudio Velasquez at a nest in Jakkalsfontein Private Nature Reserve in the west coast of South Africa (included in the film: *Secret Life of the Circler*) indicates that such cameras are invaluable for recording rare or infrequent events.

We suspect that many birds nests are depredated by small to medium predators in southern Africa (Penn Lloyd pers. comm.) and this may have arisen from the reduction or extermination of the larger predators such as lion, leopard and hyaena allowing the meso-predators to increase to higher levels than otherwise possible (Crooks and Soule 1999). This may increase the chances of ground-nesting birds being depredated but little data exists on predation levels before the extirpation of the larger predators.

References

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