Breeding of the Giant Kingfisher *Megaceryle maxima* at Lake Naivasha, Kenya

Lake Naivasha, once described as the Jewel in the Crown of all the East African lakes, has in recent decades been subjected to a series of devastating human pressures, not least the establishment of a vast horticulture and agriculture industry along its shorelines, but also the ever-increasing inflows of nutrients from siltation, sewage and other effluents emanating from a lakeside human population now approaching a million people (Turner 2016). In addition, years of illegal fishing practices by hundreds of licensed and unlicensed fishermen, coupled with a series of alien crayfish 'invasions' that have almost totally eliminated the underwater flora of the lake, have all directly contributed to the steady decline of all waterfowl populations over the past twenty years (Turner 2016, Rift Valley Waterbird Counts 1997–2019).

However, one bird, the Giant Kingfisher *Megaceryle maxima*, has steadily increased its numbers at the lake from around 2 or 3 pairs in the early 1960s (N. Carnelly pers. comm.) to an estimate today of around 50–60 individuals (Madindou *et al.* 2019). This population feeds almost entirely on an abundance of the introduced Common Carp *Cyprinus carpio*, but also on the large numbers of tilapia that are available in the lake today following the regular 'stocking of fingerlings' by the Fisheries Department.

While the Giant Kingfisher is typically found on highland rivers, streams and lakes above 1500 m (Zimmerman *et al.* 1996), particularly those in close proximity to trout farms, its presence at Lake Naivasha is of particular interest because there are few if any suitable hole nesting sites around the entire lakeshore. The breeding of a pair from July through to late September 2019 therefore offered an ideal opportunity to study in detail their activities during both the incubation and fledging periods. Here we document this unusual record and share some details of the nesting site and breeding behaviour that we observed.

In recent years, large numbers of cattle, sheep and goats have overgrazed extensive areas of bush and grassland around the lake, and with the loss of the lake's all-important papyrus belt have directly contributed to the high levels of silt and other nutrients entering the lake, also to the alarming levels of soil erosion taking place throughout the district (Turner 2010). As a result, the emergence of many eroded gullies, gorges and ravines now offer ideal sites for many hole-nesting birds such as White-fronted Bee-eater *Merops bullockoides*, Rufous-crowned Roller *Coracias naevius* and Anteater Chat *Myrmecocichla aethiops* (D. Gachucha, pers. obs.).

On or around 20 July 2019 a pair of Giant Kingfishers was observed daily flying inland from the lake, and on 26 July were observed at a nest hole in an eroded gully some 1.5 km from the lakeshore (Fig. 1). Incubation was clearly in progress because the incubating bird was observed being fed by its mate. Daily observations from then on confirmed that incubation was being undertaken by both sexes for 24 h at a time, with changeover taking place between 06:30 and 07:00 each morning for the entire incubation period. The nest hole (16.5 cm x 27 cm) was high in a vertical sandy bank 4 m from the floor of the gully and 1 m from the top. The nest tunnel itself was 1.9 m in length.

Figure 1. Adult close to nest hole with large tilapia for young (photo: Gabriel Benson).

First indications of hatching were around 12–13 August when both adults were observed taking small earthworms *Limnodrilus* sp. and fish into the nest tunnel. Later, the size of fish taken to the young ranged from 4 to 9 cm in length, and largely consisted of tilapia fingerlings that were readily available along the lakeshore. The first young bird (an almost fully fledged female) left the nest hole early on 22 September (some 40 days after hatching) and immediately accompanied the adult female all the way to the lakeshore; a few hours later it returned with the female to the nest, but it stayed outside while the female was inside with the other two young. The two remained together for the remainder of that day at or near the lakeshore.

Meanwhile, the second and third chick (a male and a second female) left the nest hole two days later (24 September) and all three continued to be fed by the parent birds for at least 7–10 days afterwards.

Brown & Britton (1980) had no breeding data from any of the Rift Valley lakes, and while this may be the first East African record of a Giant Kingfisher breeding so far from water, a similar case was documented in South Africa back in the early 1930s (Johnson 1932).

A few days after these observations, an additional family of four Giant Kingfishers was observed nearby, a clear indication that the Lake Naivasha population of Giant Kingfishers continues to increase.

Acknowledgements

The authors wish to thank Nigel Carnelley for his encouragement and logistical support throughout the duration of this study.

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Scopus 40(1): 28–30, January 2020
Received 13 October 2019

An active nest of the Karamoja Apalis *Apalis karamoja* from Tanzania

In the evening of 20 August 2004, we were camped on the edge of the Wembere floodplain 2 km east of the main highway that crosses the floodplain (1052 m, contact author for coordinates). The habitat is sparse *Acacia drepanolobium* thicket on black cotton soil with large swathes of open grassland grazed by cattle belonging to the local Wanyaturu people. The following morning we located four pairs of Karamoja Apalis exhibiting both display and song. Following an individual bird EMB located an active nest close to camp (Fig. 1). On examination, there were two eggs, but these were not removed to photograph them due to the fragile nature of the nest and our reluctance to unduly disturb the birds.

The nest was about 2.5 m above the ground in a medium-sized *Acacia drepanolobium* and was quite easy to see once found (Fig 2). It was domed and made entirely from a fine plant material that we did not identify and reassembled that of a Penduline Tit *Anthoscopus* sp., with a small side entrance hole rather than the open cup nest of a Yellow-breasted Apalis *Apalis flavida*, the only other apalis nest with which we were familiar.

Figure 1. Nest of Karamoja Apalis *Apalis karamoja* built into the twigs and thorns of an *Acacia drepanolobium* tree (photo N.E. Baker).

Figure 2. The nest was built into the tree pictured. The open habitat is shown, and the person gives scale to the tree (photo N.E. Baker).

On 23 July 2016 we found another nest, but again did not wish to disturb it during the known breeding season (contact author for coordinates). At less than 2 m above the ground, it was placed lower in the *Acacia drepanolobium* than the earlier nest, but otherwise appeared identical.

A nest from the Ugandan population in Opige & Skeen (2011) appears identical to those found on the Wembere Steppe.

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Scopus 40(1): 31–32, January 2020
Received 6 August 2019