Scopus 35: 1–10, July 2015

First recorded breeding of Clarke's Weaver *Ploceus golandi*

Colin H.W. Jackson, Fleur Ng'weno, Julius Mwambire, Jonathan Mwachongo, Albert Baya, Patrick Changawa, Japhet Garama, Samuel Kenga, Samson Katisho, Samson Barisa, Kazungu Thuva, Peter Wario, Brian Finch, Silas Ekesa and Gabriel Katana

Summary

The breeding site and nest of the Kenyan-endemic Clarke's Weaver had remained a mystery for 100 years. The species was described in 1913 from the north Kenya Coast, but the first breeding colony was found in March 2013 in the northern section of the Dakatcha Woodlands, northwest of Malindi. An estimated 400–500 nests were concentrated in a small area of a tiny wetland. Adults were displaying and nest-building on 23 March, and when next visited on 7 April, adults were feeding young in the nest. Nests were coarsely woven with a low side entrance, placed in the tops of tall sedges, standing in water. Both males and females contributed to nest building and to feeding the young on insects, and breeding appeared to be closely synchronized, so that by 19 April the colony had been abandoned.

Introduction

Clarke's Weaver *Ploceus golandi* is a member of the weaver family Ploceidae, which is represented in Africa by more than 90 species (Fry & Keith. 2004). It was first described from a specimen of a single male taken "somewhere between Mombasa and 100 miles to the north" in 1912 by a field assistant of Col. Stephenson Clarke and his brother Capt. Goland Clarke (after whom Stephenson Clarke named the bird) (Clarke 1913). There were no further records were made of the bird for over 40 years and it was even thought to possibly be a "partially melanistic phase" of Lesser Masked Weaver *P. intermedius* (Mackworth-Praed & Grant 1957).

Clarke's Weavers were rediscovered in the 1950s in the Arabuko-Sokoke Forest between Kilifi and Malindi on the coast of Kenya, and the species was included in *A Field Guide to the National Parks of East Africa* (Williams 1967) as one of "the rarer birds". From the early 1980s it was frequently seen in the Arabuko-Sokoke (Backhurst 1986, Turner & Pearson 1989, FN pers. obs.), especially in the *Brachystegia* woodland. In July 1994, Clarke's Weavers were observed by D. Ngala and D. Turner in the Dakatcha Woodlands *c.* 25 km to the north of the Arabuko-Sokoke (Pearson & Turner 1998) where a significant area of *Brachystegia* forest exists, the most northerly in East Africa. Still there was no real evidence of breeding except for four observations of free-flying dependent young being fed by adults (Jackson 2011).

Recorded only from the Arabuko-Sokoke Forest and Dakatcha Woodland, and with a population estimated at only 1000–2000 pairs in 1985, Clarke's Weaver has been listed as Endangered on the IUCN Red List (Collar & Stuart 1985, BirdLife International 2015).

Since many birders visit the Arabuko-Sokoke Forest, yet no evidence of breeding had ever been reported, it had been assumed for some years that the weaver must breed elsewhere, the Dakatcha Woodlands being the other likely option (Fanshawe 1994, Jackson 2011). From August 2000, A Rocha Kenya carried out near annual surveys for breeding birds in *Brachystegia* habitat in the Dakatcha Woodlands. In 2005, Nature Kenya secured funds from the Critical Ecosystem Partnership Fund to build community capacity for the conservation of Dakatcha Woodland Important Bird Area. FN and members of the Dakatcha Woodland Conservation Group (DWCG) then undertook regular bird monitoring in the IBA from 2007.

Clarke's Weaver has been placed in a superspecies with Weyns's Weaver *P. weynsi* (Fry *et al*. 2004), a similar-looking, social forest weaver in Uganda. The breeding site of Weyns's Weaver was unknown until 2007 when it was discovered in swamps adjacent to the forest where it foraged (Mills 2007). This suggested that Clarke's Weaver might also breed in wetlands and so more effort was put into surveying wetlands within the Dakatcha Woodland.

First record of Clarke's Weaver roosting in seasonal wetlands

During the first week of January 2013, a monitoring team from Nature Kenya and Dakatcha Woodland Conservation Group (DWCG) surveyed various sites in the Dakatcha Woodland IBA. It had rained heavily in December, and many of the small wetlands had filled with water. On 5 January about midday, the team drove through the Chamari-Chalalu Community Conserved Area to an area known as the Chalalu seasonal wetland (2°51.08´ S, 39°51.90´ E; Fig 1.). This is a low area, the size of two or three football fields, and it was lush with tall grasses. A small part of the grassy area was deeper, with two kinds of *Cyperus* sedges growing in water.

On 6 January, whilst driving along the edge of Chalalu wetland in mid-morning, a flock of about 120 Clarke's Weavers, mostly adult males, was seen in the meadow. These were flying in and out, chattering, and perching on the sedges and on a *Terminalia* tree and *Thespesia* bushes, then disappearing among the sedges. Small flocks flew out and disappeared over the trees, while others arrived and landed in the wetland. In the same wetland there were several Grosbeak Weavers *Amblyospiza albifrons*, mostly males, with some old nests. They were displaying, singing, chasing each other, and sometimes chasing the Clarke's Weavers. There was also a flock of about 40 Red-headed Quelea *Quelea erythrops*, mostly males, flying and landing with the Clarke's Weavers. The Grosbeak Weavers and at least some of the Clarke's Weavers remained in the sedges at nightfall. This was the first observation of Clarke's Weavers both roosting and using a wetland, but no nests or evidence of breeding activity was seen.

On 31 January the wetland was revisited by FN with members of the DWCG and A Rocha Kenya staff. Clarke's Weavers were still present, but only 30–40 birds remained, suggesting that the site was only being used for roosting. On 22 March, FN and a DWCG team found that the Chalalu wetland had dried up and local community members had cut the sedges for roofing material; no Clarke's Weavers were seen. There were, however, a few coarsely woven nests among the cut sedges on the ground, which were assumed to be those of Clarke's Weaver, and contained pieces of broken light blue egg shell.

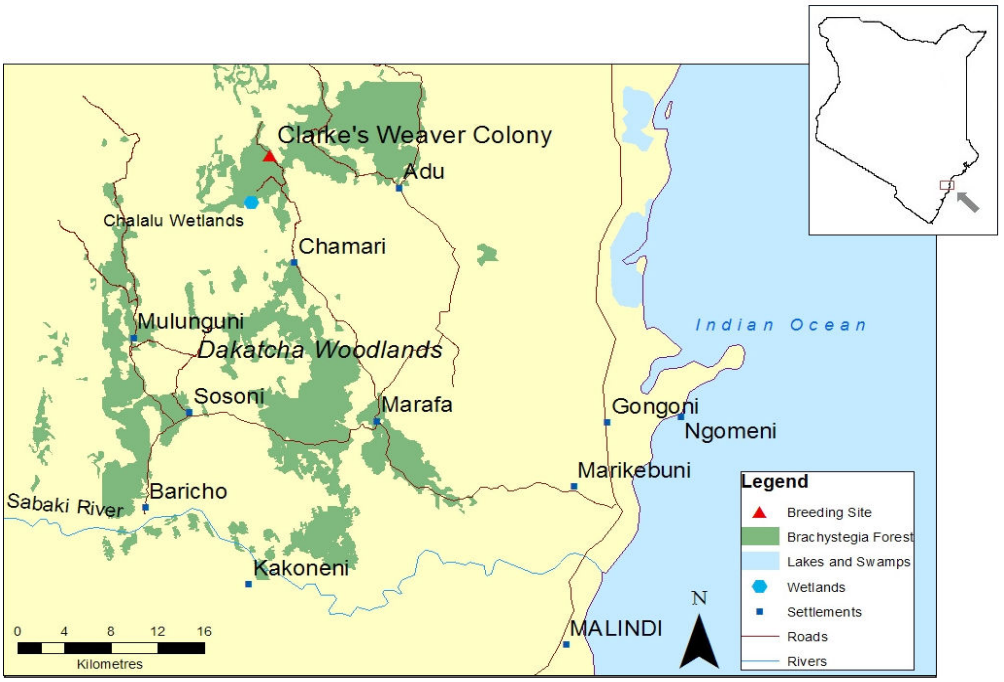

Figure 1. Map showing the location of the Clarke's Weaver colony within the Dakatcha Woodlands area. The distribution of *Brachystegia* woodland is a rough depiction of key areas of this habitat.

Breeding site found

The Nature Kenya/DWCG team surveyed several sites on 22–23 March. There had been rain showers in March, and the flowering *Brachystegia spiciformis* trees were bright green with new leaves.

On 23 March, at a small seasonal wetland known as Arbamukenge (2°48.87′ S, 39°52.80′ E; Fig.1), a large flock of Clarke's Weavers was seen in the sedges. Several hundred birds, males and females, were actively flying back and forth across the wetland. They were making buzzing, sizzling calls, and some males seemed to be displaying, while others just perched on the sedges. Several birds flew off to another part of the wetland, but they soon returned, both males and females carrying strips of sedge. Where they landed, the dark brown, rounded shapes of nests could be made out in the tops of the sedges. Some females were perched on top of the nests and a male was observed weaving more sedge strips into a nest. The breeding site had finally been discovered.

The next day many weavers were seen in the wetland. An overall estimate of *c.* 700 individuals was made for the colony, and the number of nests was estimated at between 400 and 500.

Figure 2. Clarke's Weaver nesting colony, the nests can be seen as brown spots nestled in the tops of the sedges (Photo J. Mwachongo).

During visits on 7–8 April, both males and females were seen carrying food to the nests, while by 15 April fledged young were being fed. On 19 April the colony appeared to have been abandoned, and by 25–27 April no Clarke's Weavers were located in the northern Dakatcha Woodlands. Four empty nests were collected, of which two were left at the DWCG Resource Centre in Marafa, and two were deposited in the ornithology collection of the National Museums of Kenya in Nairobi.

Description of colony and nests

Arbamukenge wetland is 80 m long and 30 m wide and is set in a mosaic of relatively low *Brachystegia* forest on white sandy soil and large patches of dense mixed forest on red soil, which is characteristic of the northern Dakatcha Woodlands (Fig. 3). It is located on the western edge of a 'corridor' of *Brachystegia* running more or less north–south and is bordered by dense mixed forest habitat consisting of trees and thickets to the west, and relatively low *Brachystegia* forest immediately to the east, southeast and north.

Figure 3. Image courtesy of Google Earth showing the location of the Clarke's Weaver colony at Arbamukenge. Dark solid green represents dense mixed forest thicket to the west, and the stippled green shows *Brachystegia* forest with white sand. The area cultivated to the north is largely for pineapple plantations. The brown line is the main track through the area.

At the time of the breeding event, Arbamukenge was a shallow, partially flooded hollow filled with grasses and the sedge *Cyperus denudatus*. It also contained a large

area of a larger, stronger sedge, *C. exaltatus*, growing *c.* 1–1.5 m (identified by the East African Herbarium, Nairobi). There was no open water except for 2–3 m^2 where people collected water at the northern end. The nests were in a section of *C. exaltatus,* and were clustered in a densely packed colony, approximately 12–15 m in diameter, and set nearer the western edge of the wetland. Sedges are normally found in deeper water than grasses, and many weavers build nests over water as a form of protection against predators (Craig. 2010).

Detailed nest description

The roughly-built nest was made of strips of sedge attached at the top to a tall, live *C. exaltatus* (Fig. 4). Its shape varied between rounded or oval, to more pouch-shaped—probably dependent on the height and density of the sedges available for attachment. Of two nests collected, one measured 170 mm high x 100 mm wide, the other 140 mm high x 80 mm wide.

Figure 4. Clarke's Weaver nest (Photo A. Baya).

Nest material consisted of broad blades of medium-sized strips of sedge that were coarsely and loosely woven. From observation, all the materials came from the same wetland, mainly *C. exaltatus* and *C. denudatus*. The entrance hole was 30–40 mm wide and located on the side of the nest, near the bottom. It lacked an entrance tube, but one nest seemed to have a slight porch over the entrance. The nests appeared to have no ceiling (see Collias & Collias 1984), but the bottom of the nests had a lining of slightly finer, softer grass-like materials. No feathers were noted in the lining. In a number of cases, the nest tapered towards the top, where it attached to the top of the sedge.

Behaviour of weavers at the colony

On 23–26 March, males were displaying and singing from the tops of nests, while both males and females collected nesting material from elsewhere in the wetland and took it back to the colony. At one point as many as 200 birds took off, flew 30 m, and landed where the sedges were shorter and less dense. Three to four minutes later they took off again and returned to the colony with a few males and females carrying strips of sedge to add to the nest construction. By 26 March the number of displaying males and birds carrying nesting material had noticeably reduced, suggesting that incubation was under way.

There was generally a constant chatter from the weavers— the familiar "sizzling" sound of the species—but from time to time all the birds would go quiet, as happened around midday on the 26 March, following which a flock of *c.* 100 flew up out of the colony and perched in a tree overhanging the edge of the wetland where they sat for a few minutes chattering again before about half took off and flew east from the colony, presumably to forage.

By 7–8 April, no males were displaying from the nests, and instead there was a steady stream of both males and females leaving the colony and returning carrying food to very vocal chicks in the nests. The majority (67%) left the colony in a northeast or easterly direction, whilst 64% re-entered from the south–southeast (Fig. 5). This implied that the birds were foraging mainly to the east of the colony.

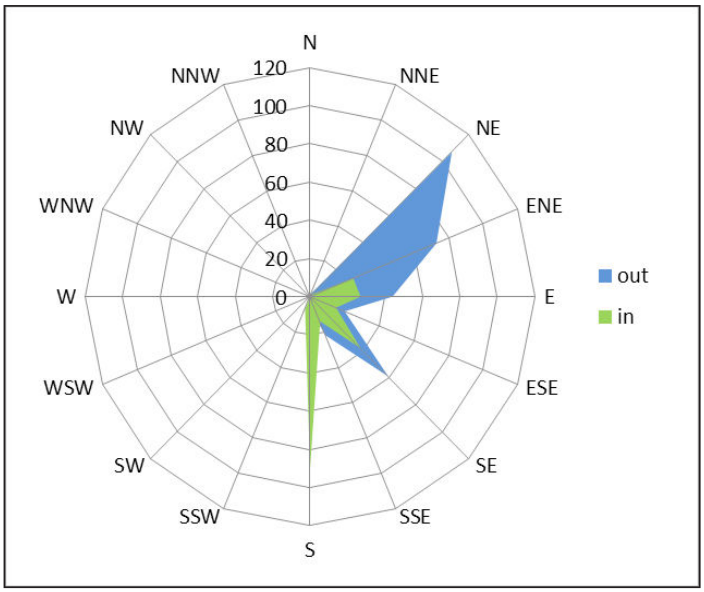

Figure 5. Direction of Clarke's Weavers leaving and entering the colony.

The general pattern was for the adults to arrive at the colony carrying food, mostly alone or in pairs, or uncommonly in groups of three or four. They would arrive with a food item and perch on top of a sedge, normally near the edge of the colony, where they would sit looking around for up to about 30 seconds before moving mostly only 0.5–2 m, where they would immediately disappear into the sedges, presumably to their nests—the nest hole entrance was not visible to an observer at the edge of the wetland.

On emerging from the nest, adults would perch on top of the nest or on a nearby sedge to preen or just to look around for a few minutes. Less commonly, an adult would emerge and fly some metres to the edge of the colony where it would sit. Then, without warning, a flock of usually between 20 and 50 birds would take off from across the colony and fly low over the sedges, gaining height to skim over the surrounding trees and leave for the foraging grounds.

Food for the young

All food items brought to the nests were insects, and most (*c.* 60% of items observed) were larvae of varying sizes. Other insects observed included grasshoppers and crickets (Figs. 6 & 7).

Figure 6. Male Clarke's Weaver bringing larva to the nest (photo C. Jackson).

Figure 7. Female Clarke's Weaver perched on top of nest carrying a cricket to feed chicks (photo C. Jackson).

Discussion

The overall breeding behaviour of Clarke's Weaver was typical of a *Ploceus* weaver of the 'Type 2' pair-formation style, where the female is attracted to the male which displays and sings while centred on the nest (Crook 1964, Craig 2010). However, some key differences stand out:

1. The nesting and foraging habitats are completely different from each other, although closely interspersed within a mosaic of different habitat types.
2. Both males and females take part in constructing the nest and feeding the young, which is not usually the case in colonial weavers.
3. The timescale for nest-building, egg-laying, hatching and fledging is relatively short, an estimated 24–30 days in total, which would be consistent with a species exploiting a seasonal wetland.
4. The colony was very restricted within the overall available area of sedges and had a high density of nests. The nests were all hidden within the relatively low vegetation of the sedges.

Clarke's Weaver is restricted to the Arabuko-Sokoke Forest and the Dakatcha Woodlands. Of these, only the former has any form of legal protection and even this is under constant threat as proven by recent attempts to carry out oil exploration inside the forest without any consultation with stakeholders and conservationists (Starkey 2014). Dakatcha Woodlands is an extensive patchwork of forest, woodland, numerous small seasonal and permanent wetlands, scrub, thicket and in recent years, more and more agricultural land. The species ranges widely across these two sites, spending most of its time in the *Brachystegia* habitat (Zimmerman *et al.* 1996), where it forages. However, protection of its breeding sites is crucial if the species is to be conserved.

Since the breeding event described here, no further colonies have been located despite searching. In January 2014 Arbamukenge was completely dry (FN pers. obs.) and there was no sign of Clarke's Weavers in the area. Clearly the mystery of the Clarke's Weaver breeding is far from being fully solved.

The observation of fledged juveniles being fed by adults during January to February had led several observers to believe the weavers would breed in November and December during the short rains. Other previous observations of juveniles being fed by adults were during April and as late as 18 July (Jackson 2011), which strongly suggests that Clarke's Weavers may be somewhat opportunistic in the timing of their breeding. They may breed either during the long rains (March–June) or the short rains (November–December)—or possibly both.

One of the prerequisites for a breeding site may be standing water below the sedges where the nests are built—a common feature of weaver colonies (Craig 2010). Breeding also probably requires good rains to flood the wetlands and to allow the sedges to grow sufficiently to support the nests. Heavy rain in December 2012 with subsequent showers through early 2013 meant that the Arbamukenge wetland was flooded, thus providing the required conditions for successful breeding.

At the time of this breeding event the *Brachystegia* trees were in full blossom and with fresh leaf growth, providing excellent conditions for insects and thus an abundant food source for the weavers, which also feed on the fresh leaves of *Brachystegia* (CJ pers. obs., D. Ngala and T. Butynksi pers. comm.). During an expedition to Dakatcha in November 1995, Clarke's Weavers were seen in juvenile plumage (though none being fed by adults) and it was noted that the *Brachystegia* had fresh leaf growth and blossoms (T. Butynski pers. comm.).

Male Clarke's Weavers appear to moult out of their black-headed plumage into a female-type non-breeding plumage between July and October (CJ in press), as is typical of many colonial weaver species (Fry & Keith 2004, Craig 2010). This would limit the possibility for rapid opportunistic breeding.

The conservation of Clarke's Weavers

Nature Kenya and the Dakatcha Woodland Conservation Group took a strong lead in engaging with the local community around the Arbamukenge wetland. There has been good willingness on the part of the community to help protect these small wetlands, which gives hope for the future of Clarke's Weavers, but sustained effort is needed to maintain the community's motivation. In a token of appreciation, the Bird Committee of the East Africa Natural History Society donated a water harvesting system to the nearby school.

The breeding event described here can only give indications of when and where Clarke's Weavers breed, providing pointers for future searches. In 2014 a thorough search was made during March and April, but no signs of breeding were found. We need to know much more about the breeding of Clarke's Weavers and their requirements for breeding, foraging and roosting if we are to succeed in protecting them effectively.

Acknowledgements

We would like to thank the AG Leventis Foundation for funding the search for the Clarke's Weaver nest by A Rocha Kenya and the fieldwork to follow up on the breeding event. Nature Kenya's bird monitoring surveys in Dakatcha were supported by the Critical Ecosystem Partnership Fund (CEPF), the European Union's Community Development Trust Fund (EU-CDTF), the Mohamed bin Zayed Species Conservation Fund, the Government of Finland and Government of Spain—we thank you all.

Thanks to all those who assisted in surveys and observations including D. Ngala and J. Baya from Arabuko-Sokoke; J. Kalama, M. Issa and A. Sifa from Dakatcha Woodland Conservation Group; N. Gardner from A Rocha Kenya; and M. Davidson, G. Odera and F. Mbago from NatureKenya. We are grateful to D. Oschadleus for his very useful comments on the manuscript, to T. Butynski for sharing his notes, and to Prof A. Craig for his detailed and helpful review.

Addendum

In 2015, a long dry season in January to March was followed by heavy rains in April. On 9 May 2015, JM and JG of Dakatcha Woodland Conservation Group (DWCG) found about 80 Clarke's Weavers, males and females, constructing nests in a sedge-filled pool in the seasonal Gandi River (2° 53.48'S, 39° 52.37'E). This second known breeding site was observed further on 21 May when FN, JM and a DWCG-Nature Kenya team observed male and female Clarke's Weavers bringing insect food to the young in the nests.

References

Backhurst, G.C. 1986. East African Bird Report 1984. *Scopus* 8: 101–140.

Clarke, S.R. 1913. [A short account of a shooting expedition ... to the Lorian, British East Africa.]. *Bulletin of the British Ornithologists' Club* 31: 31–33.

Collar, N.J. & Stuart, S.N. 1985. *Threatened birds of Africa and related islands*, International Council for Bird Preservation; International Union for Conservation of Nature and Natural Resources. Download from http://agris.fao.org/agris-search/search.do?recordID=US201300639942 on 12/1/2015.

Collias, N.E. & Collias, E.C. 1984. *Nest building and bird behavior*. Princeton: Princeton University Press.

Craig, A.J.F.K. 2010. Family Ploceidae. In J. del Hoyo, A. Elliott & D.A. Christie (eds). *Handbook of the Birds of the World.* Vol. 15. Barcelona: Lynx Edicions.

Crook, J.H. 1964. The Evolution of Social Organisation and Visual Communication in the Weaver Birds (Ploceinae). *Behaviour, Supplement*. Downloaded from http://www.jstor.org/stable/30039146 on 12/12/2014.

Fanshawe, J.H. 1994. Birding Arabuko-Sokoke Forest and Kenya's northern coast. *Bulletin of the African Bird Club* 1: 79–89.

Fry, C.H. & Keith, S. (eds) 2004. *The Birds of Africa.* Vol. 7. London: Christopher Helm.

Jackson, C. 2011. *In Search of Breeding Clarke's Weavers: An Analysis of the Chronology of Clarke's Weaver Observations*. A Rocha Kenya, Occasional Research Report #22, Watamu.

Mackworth-Praed, C.W. & Grant, C.H. 1957. *Birds of eastern and north eastern Africa.* London: Longmans, Green & Co.

Mills, M. 2007. Where does Weyns's Weaver *Ploceus weynsi* breed? *Scopus* 26: 44–46.

Pearson, D.J. & Turner, D.A. 1998. Review of Kenya bird records 1992–1996. *Scopus* 20: 65–83.

Starkey, J. 2014. Oilmen threaten catastrophe in Kenya wildlife haven, *The Times* (London). Downloaded from http://www.thetimes.co.uk/tto/environment/wildlife/article4270571.ece on 12/12/2014.

Turner, D.A. & Pearson, D.J. 1989. The 1987 East African Bird Report. *Scopus* 11: 101–119.

Williams, J.G. 1967. *A Field Guide to the National Parks of East Africa*. London: Collins.

Zimmerman, D.A., Turner, D.A., & Pearson, D.J. 1996. *Birds of Kenya and northern Tanzania*. Princeton: Princeton University Press.

Colin H.W. Jackson
A Rocha Kenya, P.O. Box 383, Watamu, Kenya. Email: colin.jackson@arocha.org and Ornithology Section, National Museums of Kenya, P.O. Box 40658-00100, Nairobi, Kenya

Fleur Ng'weno
NatureKenya, P.O. Box 44486-00100, Nairobi, Kenya. Email: fleur@africaonline.co.ke

Julius Mwambire, Patrick Changawa, Japhet Garama, Samuel Kenga, Samson Katisho, Samson Barisa, Kazungu Thuva and Peter Wario
Dakatcha Woodland Conservation Group, P.O. Box 1–80207, Madina via Malindi, Kenya

Brian Finch
NatureKenya, P.O. Box 44486-00100, Nairobi, Kenya

Jonathan Mwachongo and Albert Baya
Arabuko-Sokoke Forest Guides Association, P.O. Box 11–80208, Gede via Malindi, Kenya

Silas Ekesa and Gabriel Katana
A Rocha Kenya, P.O. Box 383, Watamu, Kenya

Scopus 35: 1–10, July 2015
Received 12 March 2015