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(continued on inside back cover)

Scopus 27: 1-5, January 2008

The Pied Crow *Corvus albus* and Somali Crow *Corvus edithae* do not hybridise as soon as they meet

Tiziano Londei

Hybridisation—the interbreeding of species—in birds is more widespread than generally understood. Contrary to a common opinion, hybrids sometimes survive and breed as well as members of the parental species (Grant & Grant 1992). Thus, why birds do not hybridise more often than they apparently do is not a trivial question. A line of thinking suggests that the maintenance of species and even speciation in birds are as much cultural phenomena as they are genetic phenomena: early imprinting starts a process of social preferences that rigorously segregates coexisting individuals into distinct cultural clusters; assortative mating follows, with few mistakes (Gill 1998). In spite of long-standing interest in the hybrid zones between the Carrion Crow *Corvus corone* and the Hooded Crow *Corvus cornix* in Europe and northern Asia, the mechanism that keeps these zones narrow, notwithstanding partial shifts in location, is still rather obscure. Parkin and colleagues (2003) report on evidence of assortative mating in various regions and of reduced fitness of the hybrids in Italy, but latter evidence (Saino & Bolzern 1992, Saino & Villa 1992) is admittedly unconvincing.

The Pied Crow *Corvus albus* is widespread across sub-Saharan Africa, whereas the Somali Crow *Corvus edithae* is restricted to the Horn of Africa. It has become increasingly apparent that these taxa are evolutionary very close, based upon similarities in morphology and behaviour, and especially because they interbreed in the wild, sometimes to the extent of forming largely hybrid populations (Kleinschmidt 1906, Zedlitz 1911, Friedmann 1937, Smith 1957, Blair 1961, North 1962, Ash 1983, Londei 1995, Londei 2005). These authors only report on hybrid (or "aberrant") birds in Ethiopia, Eritrea, or Somalia, but Urban (2000) reports hybridisation in all countries (except Djibouti) in the range of the Somali Crow; this would include the extreme south-east of the Sudan and much of northern Kenya. There are records of Somali Crows in the Sudan since the first half of the last century (Madden 1945) but only a single record of a hybrid in the country (Nikolaus 1987); there are no records of hybrids or mixed pairs in Kenya. No Pied Crows were seen in northern Kenya at the beginning of the 20th century (see Friedman 1937, Archer & Godman 1961), at a time when hybrids had already been collected in Ethiopia (Kleinschmidt 1906) and on Dahlak Kebir Island in Eritrea (Zedlitz 1911). Urban (2000) reports differences in the ecology of sympatric Pied and Somali Crows between the Horn of Africa, where they share the same habitat, and

Kenya, where Pied Crows are confined to villages whereas Somali Crows occur more in desert habitats. Comparison of these records suggests that populations of the Pied and the Somali Crows are gradually increasing their contact and consequent hybridisation.

Observations

From 18 to 26 August 2006 I was in northern Kenya, working a route through Laisamis, Marsabit, Kalacha, North Horr, Koobi Fora, Loyangalani, South Horr, Baragoi, and Maralal. I counted 26 Pied and 95 Somali Crows, but no hybrids, and no mixed pairs. For comparison, the hybrids Blair (1961) counted in mixed flocks in Ethiopia equalled, or even outnumbered, the less numerous parental phenotype (the Pied Crow). On Dahlak Kebir Island, the hybrids outnumbered both parental phenotypes (Londei 2005). In the semi-desert areas of northern Kenya, I confirmed Urban's (2000) statement that only Somali Crows occur away from villages, to which the Pied Crows are confined. However, because considerable numbers of Somali Crows also occurred inside villages, the lack of hybridisation could not be caused solely by habitat segregation. I found two Pied Crow pairs among some Somali Crows by a rubbish dump in Marsabit village (02°20'N, 38°00'E) and two Pied Crow pairs that shared some lookouts with two Somali Crows in Loyangalani village (02°46'N, 36°43'E). These apparently well-established Pied Crow pairs were in places previously only known for isolated non-breeding records of the Pied Crow (map in Zimmerman *et al.* 2005), well outside the northern limit of its usual breeding range and inside the range of the Somali Crow. Examination of my photographs from several places evidenced a recurring difference between Pied and Somali Crows: although actually similar in size and proportions, the Somali Crows looked slimmer because differences in moult (Figure 1). Thus it seems likely that many, if not all, of the Pied and the Somali Crows then occurring together were still adapted to different climates (requiring different moulting times). The range overlap of the Pied and Somali Crows in northern Kenya may be in progress.

Discussion

Seasonal movements are known to occur in Pied Crow populations, but not in Somali Crow populations. In Darfur, the Sudan, where a north-south migration allows Pied Crows to avoid the rainy season, Wilson (1981) supposed that birds tended to stay longer in the north than 50 years before. Additionally, many were resident because the enlargement of human settlements had made them attractive as year-round food sources. Where they coexist with Somali Crows, resident Pied Crows might, in time, attain breeding synchrony and hybridise. According to Blair (1961), an eastward migration across the Rift Valley in Ethiopia would bring Pied Crows into contact with resident Somali Crows and could account for the hybrid population on the Arussi plateau. In my opinion, the same migrational trend might drag both Pied Crows and hybrids from the Arussi plateau up to north-western Somalia, where hybrids have indeed been found (map in Ash & Miskell 1998). A rare bird in northern Somalia until the middle of the 20th century,

the Pied Crow has rapidly increased its presence thereafter, but is probably still only a visitor (Ash & Miskell 1998). In southern Somalia however, Pied Crows are resident and thus the hybrids found near Muqdisho were probably born there. From likely absence of the Pied Crow from northern Kenya, Archer & Godman (1961) inferred its absence from nearby (southern) Somalia. After an exhaustive search in the ornithological literature on the then Italian Somaliland (publications from 1852 to 1936), Moltoni (1936) was only able to cite one paper with Pied Crow records (Patrizi 1935), where the observer reports on "some" Pied Crows on an islet of the Bajuns, south of Kismaayo, and adds that Pied Crows were "also frequent" on the coast, in August 1934. Therefore, Pied Crows may have spread gradually from Kenya into southern Somalia along the coast, where most seem still restricted. More intense human settlement may explain why Pied Crows have become resident only in the south. Muqdisho is the most settled area, so the attraction both of Pied and Somali Crows to this area may have lasted long enough to result in hybridisation. Little is known about movement among Somali Crow populations, but the birds recorded in south-eastern Sudan (where the Pied Crow is the usual crow species) suggest arrivals from northern Kenya. This might, in due time, make hybridisation more likely in the Sudan too.

Figure 1. Pied and Somali Crows together in northern Kenya. The Pied Crow, at a different moulting stage, was actually paired with another Pied Crow (Marsabit village, 19 August 2006).

The geographic comparisons above suggest that Pied and Somali Crows do not hybridise as soon as they meet. Their apparently slow hybridisation contrasts with the well-known case of the Snow Goose *Chen caerulescens* in North America, where two formerly allopatric, differently coloured phenotypes began to meet consistently in the late 1920's and their hybridisation was already massive by the 1980's. The only limiting factor found there, assortative mating based on imprinting, seemed only able to retard complete hybridisation (Cooke *et al.* 1988). In my opinion, crow hybridisation might initially depend on how often individuals motivated to mate meet a potential mate of the different, rather than same, phenotype. This would require synchrony in the breeding

cycles of different populations, which might be acquired after a rather long period of living in the same habitat. Later, imprinting on parental phenotype might be crucial. Depending on the individual imprinting model, the mating choice for minority phenotypes, hybrids included, might be either prevented or enhanced. In any case, as far as those mixed populations that show no other obstacle to become completely hybrid (Risch & Andersen 1998, Londei 2005) suggest, assortative mating would persist as a primary limit to free hybridisation. A connected reason, for both the slow hybridisation process and its final limits, might be the strong intolerance that crow flocks usually show against unusual-looking conspecifics (e.g., Kramer 1941). Consequently, as proposed by Londei and colleagues (1994), the fitness of locally minority phenotypes would decrease with distance from the 50 % line of the hybrid zone, impeding the spread of their genes. Although this is still speculation, Archer & Godman's (1961) report of a Pied Crow straggler at Berbera, northern Somalia, which "was never seen to consort with the many Dwarf Ravens (*edithae*) in the town, but lived in solitary state" seems to be in support. Compared to the Carrion and the Hooded Crows, the Pied and the Somali Crows offer more varied situations for the study of hybridisation. They hybridise in less accessible areas for study, but human settlement, on which crow settlement depends to a large extent, is more dynamic in African countries. Studying the hybridisation process in Africa might make the whole mechanism of crow hybridisation clearer.

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Diet composition of Sokoke Scops Owl *Otus ireneae* in Arabuko-Sokoke Forest

Munir Z. Virani

Food and nest site availability are the two principal factors that influence the distribution and abundance of birds (Newton 1998). A scientifically sound understanding about these provides the basis for the practical management and conservation of wild populations. For example, it is vital to know the diet of a critically endangered species if conservation action calls for captive breeding. This paper examines the diet composition of the Sokoke Scops Owl *Otus ireneae*, an endangered species found only at Arabuko-Sokoke Forest in coastal Kenya and the foothills forests of the East Usambara Mountains in Tanzania (Hipkiss *et al.* 1994, Virani 2000). In the Arabuko-Sokoke Forest, the species is mainly confined to the *Cynometra* woodland habitat (Britton & Zimmerman 1979, Kelsey & Langdon 1984, Virani 2000), although there is also a small population in *Brachylaena* woodland to the north of the (C. Jackson pers. comm.). The only data regarding the scops owl's diet (based on stomach contents of an unspecified number of individuals) suggested that invertebrates are an important component of the owl's diet (Ripley & Bond 1971).

Forest owls present a challenge because they are particularly difficult to study due to their nocturnal habits and the nature of the habitat in which they occur. Owls of the genus *Otus* (scops owls) are the largest and most widespread group of owls with at least 21 different species occurring in the Old World (Kemp & Calburn 1987). This group of owls is unique in that the range of prey, habitats and climates in which they have radiated make the evolutionary relationships between species difficult to unravel (Kemp & Calburn 1987).

Five species of the genus *Otus* occur on mainland Africa of which four are endemic: Sokoke Scops Owl *Otus ireneae*, West African Cinnamon Scops Owl *O. icterrorhynchus*, African Scops Owl *O. senegalensis* and White-faced Scops Owl *O. leucotis*. Being strictly nocturnal, *Otus* owls are not amenable to study and relatively little is known about their ecology compared to other owl taxa (Tarboton & Erasmus 1998).

Materials and Methods

Arabuko-Sokoke Forest (3° 20′ S, 39° 55′ E) covers an area of 372 km^2. This study was conducted in a 1 km^2 patch within the 99 km^2 large *Cynometra* woodland in the northern part of the forest. The 1 km^2 patch was selected based on availability of suitable roads and tracks that facilitated the making

of a network of transects in a form of a grid. The *Cynometra* woodland patch was mainly homogenous dominated by an association of *Cynometra webberi*, *Manilkara sulcata* and *Brachylaena huillensis*. Numbers of the latter two trees have been indiscriminately logged over the last few decades and therefore occur in much lower densities than *Cynometra*. Other common tree species within the focal study site included *Memecylon* sp, *Combretum schumannii*, *Salacia* sp. and *Strychnos* sp. The woodland canopy usually extended up to 15 m where mature trees were present, while the understorey contained small trees, shrubs, lianas, vines and Cycads *Encephalartos hildebrandtii* in dense tangles.

Three pairs of Sokoke Scops Owls were intermittently radio-tracked for a total of 57 days between July and October 1993 to establish ranging behavior and roost sites. The owls were fitted with 1g back-pack transmitters (produced by Hollohill Ltd, USA) sewn into cotton fabric with a weak link that enabled the transmitter to fall off when the link frayed. The owls' locations were marked before dusk and after dawn to obtain roost site fixes. In addition, eight locations were obtained for each owl per pair throughout the night to establish ranging behaviour (Virani 1995). For all three pairs, the ground under active roosts was cleared so that pellets could be collected. Pellets were collected immediately after dusk when the owls left their roosts to forage. After collection, pellets (and half pellets) were placed in a plastic bag, labelled and refrigerated for further analysis. Nearly two-thirds of the pellets collected had either disintegrated due to damp forest conditions, or were partially consumed by ants soon after regurgitation. All collected pellets, both complete and fragmented, where soaked in water before identification of prey contents under a 3X magnification dissecting microscope. Where possible, prey fragments were identified to order level while unidentified fragments such as feathers (most likely from the owls' facial disc) and chitinous material (mainly insect bits) were categorized separately. During radio-tracking sessions on full moon nights, it was possible to briefly observe the owls when they were foraging.

Results and Discussion

Fifty three pellets (17 whole and 36 half or fragmented) were collected from the three pairs of owls under nine different roosts within the study patch. Three complete pellets were collected from pair 1, four from pair 2 and ten from pair 3. Pellets were compact, round to slightly elongated masses of undigested material, usually dark when fresh. On average, a complete pellet measured 9.96 mm in length (n = 17, range 7.84 - 13.2 mm), 7.85 mm in width (range 6.68 - 9.82 mm), and weighed 0.08 g (dry weight) (range 0.04 - 0.11 g). About 30 % of the pellets were made up of plant and soft material. The plant material probably originated from consumption of herbivorous prey, while the soft material was unidentifiable.

Table 1 lists all prey items found in the pellets, identified from heads,

elytra, legs, thoraces and mandibles. Over 99 % of the prey items in the pellets consisted of insects. Of these, 91 % were from the order Coleoptera, 1.8 % from Orthoptera, 0.003 % from Hymenoptera and the remaining 6.3 % consisted of unidentified masses of chitinous material. The small size of the owl (between 48 and 51 g) probably makes it difficult for it to hunt small rodents. Similarly, diet studies from pellets analysed of the critically endangered Seychelles Scops Owl *Otus insularis* showed that the species fed exclusively on invertebrates, although Coleopterans made up only 14 % (Currie *et al.* 2003).

Table 1. Distribution of prey items found in 53 Sokoke Scops Owl pellets collected between July and December 1993 in the Arabuko-Sokoke Forest

Order	Family	Sub-family	Number	Percentage
Coleoptera	Scarabaeidae (Chafers)	Melolonthinae/Rutelinae	313	78.3
	Lucanidae (Stag Beetles)	Species 1	47	11.8
		Species 2	5	1.3
Orthoptera (Cricket)			7	1.8
Hymenoptera	Formicidae (ants)		1	0.003
Small feathers			2	0.005
Unidentified chitinous material			25	6.3

Owl foraging behaviour was difficult to observe due to the dense structure of the *Cynometra* woodland. On two occasions, a Sokoke Scops Owl was seen to pounce at potential prey objects within the dense foliage, and return to the same perch to devour them. This is consistent with studies of the Seychelles Scops Owl that show significant foraging from foliage and on tree trunks (Currie *et al.* 2003).

From stomach analysis contents of the Sokoke Scops Owl, Ripley & Bond (1971) found medium sized insects mainly belonging to the order Orthoptera and Phasmida. This is in contrast to the findings of this study where the owls mostly fed on Coleopterans. However, it implies that the Sokoke Scops Owl possibly feeds on a large variety of insects depending on their availability, and its restricted distribution within the Arabuko-Sokoke Forest is unlikely to be from lack of preferred prey. Related to this unspecialised feeding behaviour, a plausible explanation for the differences in prey composition between this study and that of Ripley & Bond (1971) is that the large number of Coleopteran prey observed in this study maybe as a result of the increase in the number of elephants *Loxodonta africana* in Arabuko-Sokoke forest over the last 20 years (Litoroh 2002). Elephant dung attracts dung beetles and this may have influenced the prey availability and hence composition of the pellets collected.

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Population status of Jackson's Widowbird *Euplectes jacksoni* in Mau Narok-Molo grasslands Important Bird Area, Kenya

Geoffrey Mwangi Wambugu and Josephine Nzilani

Tropical grasslands occur both at lowlands and highlands. Highland grasslands in Kenya are known to occur between 2200 m and 3000 m altitude with a minimum of 1000 mm rainfall, and with frequent mists (Pratt & Gwynne 1977). In Kenya, most highland grasslands are privately owned, and none of them is under legal protection under the current protected area system. The Mau Narok-Molo Grasslands and the Kinangop Grasslands Important Bird Areas (IBAs), on either side of the central Rift Valley in Kenya, are the only sites that hold significant areas of Kenya's unique highland grasslands. These grasslands are important for a number of migratory bird species and various specialized grassland birds of which the key species are two threatened Kenyan endemics—Sharpe's Longclaw *Macronyx sharpei* and Aberdare Cisticola *Cisticola Aberdare*, in addition to one restricted range and globally Near Threatened species, Jackson's Widowbird *Euplectes jacksoni* (BirdLife International 2007). Additionally, the Mau Narok-Molo IBA holds distinctive avifauna and other little-studied and unique biodiversity. Other bird species of conservation concern that occur here include Lesser Kestrel *Falco naumanni* (Vulnerable), Great Snipe *Gallinago media* (Near Threatened), Great Crested Grebe *Podiceps cristatus* (Regionally Critical) and Denham's Bustard *Neotis denhami* (Regionally Endangered).

Historically, the habitat in Mau Narok and Molo was mainly tussock grasslands, which favoured the survival of grassland-specialist bird species. However, increasing human settlements into the area by both the large-scale and small-scale agriculturally based communities since the 1960s left the birds almost exclusively on privately owned land. As the human population in these areas continues to grow, increasingly more grasslands are converted to other uses (Ndang'ang'a & Mulwa 2002). Grasslands are now found within privately owned land holdings, which are gradually decreasing in size due to land subdivision and intensive use of the resultant land parcels. Consequently, native tussock grasslands are rapidly being fragmented and converted into pasture, arable land, woodlots or residential plots. This has serious implications for the conservation of grassland biodiversity.

The Mau Narok-Molo area is home to thousands of Kenyans, mainly comprising of two small-scale farming communities and a pastoralist community (Ndang'ang'a & Mulwa 2002). Farming, both commercial and subsistence, is the main economic activity. As a result, the grasslands are being

cleared and converted into cultivation, precipitating a steep decline in their extent and quality. Because of its biological importance and the severe threats that it faces, the Mau Narok-Molo Grasslands IBA is classified as Critical in priority for conservation action (Bennun & Njoroge 1999).

Prior to this study, Jackson's Widowbird status in the Mau Narok-Molo Grasslands IBA was unknown (Bennun & Njoroge 1999). It is believed to be a seasonal visitor in Kinangop Grasslands IBA where it nests in tussock grasslands, and occasionally in wheat fields. It appears that these two IBAs hold significant numbers of this species and are believed to be the world's stronghold for the species. As indicated, both Kinangop and Mau Narok-Molo grasslands are under enormous pressure for conversion, especially through the removal of tussocks that are believed to be unpalatable for livestock (Ndang'ang'a & Mulwa 2002).

Because an effective conservation programme for any vertebrate species can only be administered when its ecology is adequately known (Soule & Kohm 1989), this study aimed at gathering the basic ecological information as baseline data upon which conservation programmes for Jackson's Widowbird could be developed. This was achieved by determining the population size and density of the species, as well as assessing the threats facing it.

Study area

The Mau Narok-Molo Grasslands IBA is an extensive stretch of montane grassland along the crest of the Mau escarpment, which forms the western wall of the central Rift Valley in Kenya (Bennun & Njoroge 1999, Ndang'ang'a *et al* 2003). This high open plateau runs approximately 80 km southeast to northwest, and is bound on each side (and partially interrupted) by the forests of the Mau Forest Complex (Figure 1). Rainfall is around 1000 mm per year, and the typical vegetation is short grassland with some heather and scrub on the ridges where soil is deeper. The area has high potential for agriculture, and has been progressively settled on by humans since the 1950s; it is now heavily populated, with a landscape enormously modified by cultivation. Cereals are the major crops.

This IBA largely falls within Nakuru district, with a small portion in Narok district, both within the Rift Valley province, Kenya. Human population density in Nakuru district is high, with about 164 people km^2 in 1999 (Republic of Kenya 2001). Grasslands in the IBA occur in two major blocks: the Molo block falls entirely within Nakuru district, whereas Mau Narok block falls within both districts.

Field methods

The survey was carried out between October 2006 and March 2007. Study plots were chosen based on their representativeness of grasslands in the site. A total of 28 study plots were surveyed, each approximately 4.5 ha: 15 plots at Mau Narok and 13 at Molo. Data were collected over four sessions (16^{th} to

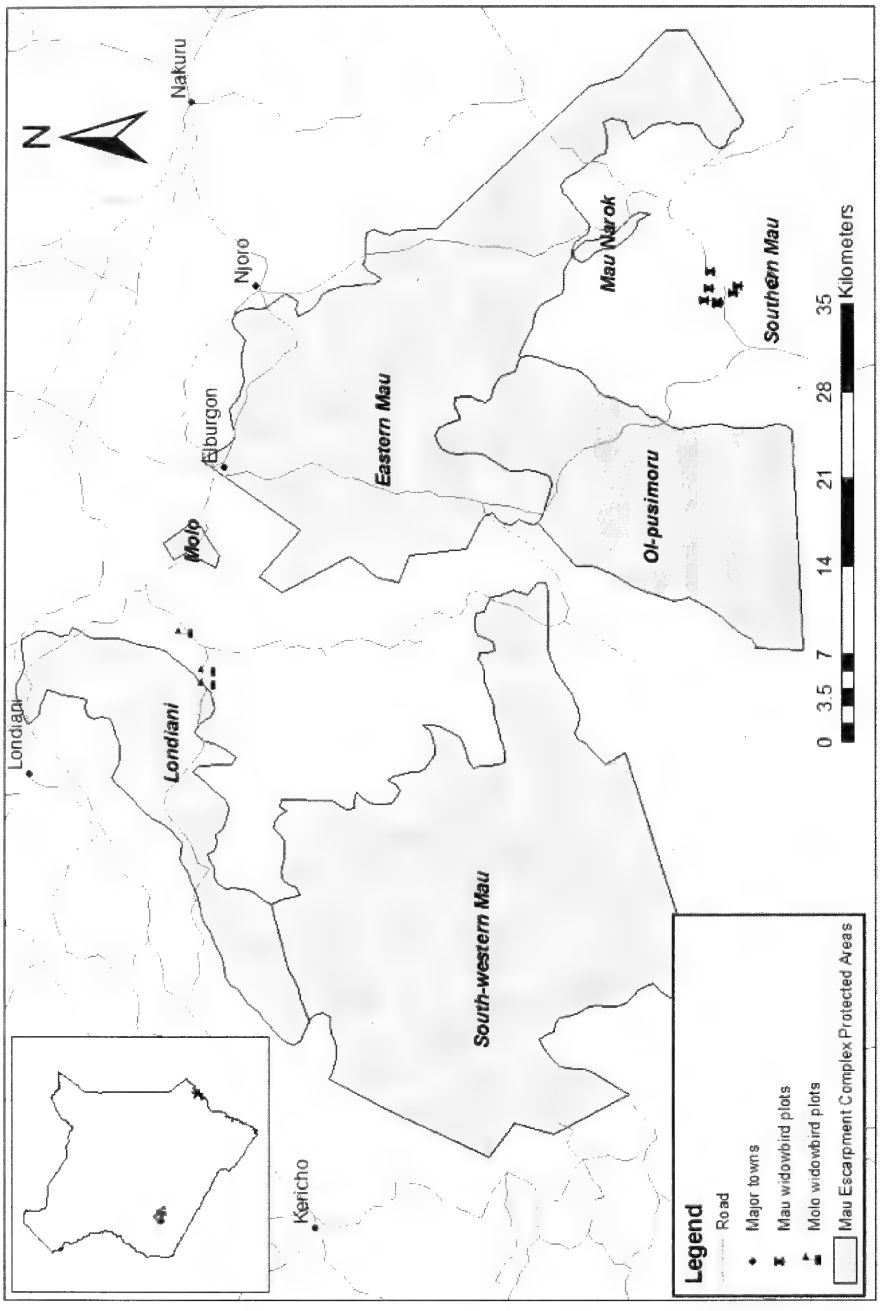

Figure 1: Map of the Mau escarpment forest complex with the 10 plots where the Jackson's Widowbird was recorded during this study; inset is a map of Kenya showing the location of the Mau complex

27th October 2006, 15th to 26th December 2006, 19th to 30th February 2007 and 21st March to 31st March 2007). Following a randomly determined sequence, every plot was counted once during each session. Fieldwork was carried out two times a day (06:30-10:00 and 15:00-18:30).

Bird Census

In each study plot, a total count of birds was done. Because the remnant grassland patches are usually long and thin, 2-5 observers walked along a line transect running along the length of the plot counting all birds seen or heard within the grassland patch.

Vegetation Survey

Vegetation was sampled within a 50-m radius sub-plot located every 150 m along the line transect traversing each plot. Grassland characteristics including grass height, percentage cover of tussock species, tree cover, shrub and wetland cover were recorded within this sub-plot. Tussock height was recorded in classes of 5-15 cm (G1), 15-30 cm (G2) and >30 cm (G3). Tussock cover was classified as: 0-10 % (T1), 10-40 % (T2), 40-70 % (T3) and 70-100 % (T4) (see also Ndang'ang'a *et al.* 2003). Burning was recorded as vegetation burnt (grass, tree, and shrub) and fire severity, while agricultural pattern (contiguous fields, scattered field and sparse field) and intensity were also noted.

Results and Discussion

Survey overview

We recorded a total of 108 bird species during the study, 85 at Mau Narok and 76 at Molo. Fifty-seven species occurred in both sites. A total of 3695 individual birds were counted, 2439 in Mau Narok and 1256 in Molo. In addition, we recorded 13 Palaearctic migrants and seven afro-tropical migrants (Wambugu & Nzilani 2007). The five most widespread species over the entire area were the Common Fiscal (encountered in 27 out of 28 plots), Baglafecht Weaver (21), Common Stonechat (20), Grassland Pipit (19), Streaky Seedeater (19) (Wambugu & Nzilani 2007). The two endemic and endangered species—Aberdare Cisticola and Sharpe's Longclaw—were encountered in 15 and 4 out of the 28 plots, respectively. Jackson's Widowbird was encountered in 10 of our 28 study plots and was the 13th most encountered species (Appendix).

Population size and density of Jackson's Widowbird

We recorded 27 flocks of Jackson's Widowbirds with a total of 1053 individuals in 10 study plots (Figure 2). Seven plots were in Mau and three in Molo. Overall, Mau Narok had 20 flocks with a total of 601 individuals, whilst Molo had seven flocks with 452 individuals. Jackson's Widowbird occurred at a mean density (± SE) of 2.1 ± 0.95 birds ha^{-1} (n = 112) across the entire study area. The difference in the Jackson's Widowbird mean density at Mau Narok (2.2 ± 1.33, n = 72) and Molo (1.9 ± 1.35, n = 56) was not significant (T-test: t = 0.05, df = 126, p = 0.48). Variation in the mean widowbird densities across all the 10 plots and the four sessions was also not significant (Kruskal Wallis: Plot: H [9, N = 40] = 2.1, p = 0.99; and Sessions: H [3, N = 40] = 2.5, p = 0.48).

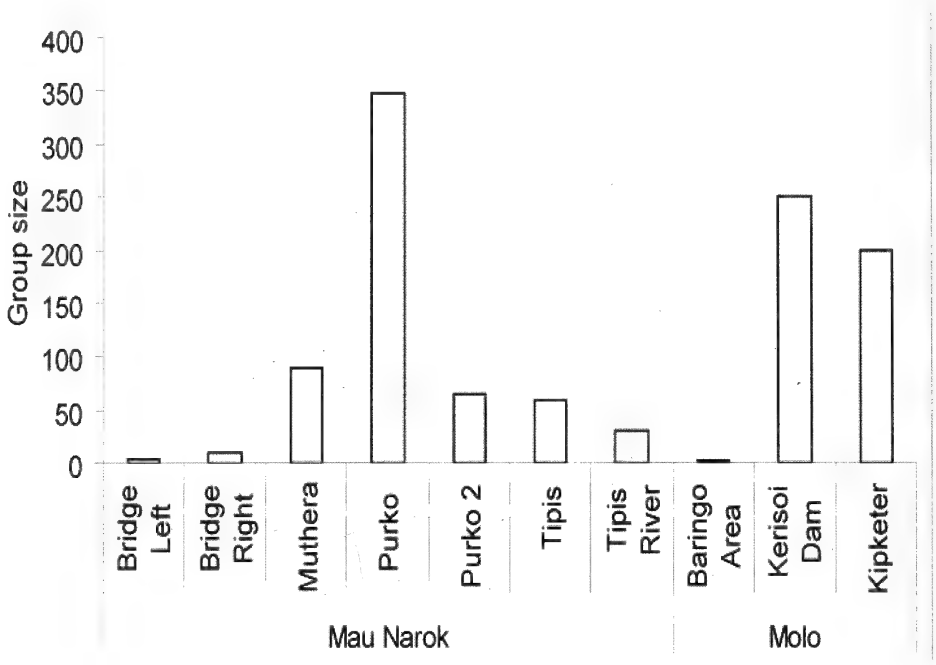

Figure 2: Numbers of Jackson's Widowbird recorded in the 10 plots in the Mau Narok-Molo Grasslands IBA

Grassland quality

Generally, there was a higher occurrence of short (G1) tussocks in Mau Narok than in Molo although the difference was not significant (T-test: t = 0.8, df =13, p = 0.22). Mau Narok had significantly higher occurrence of tall (G3) tussocks than Molo (T-test: t = 3.2, df = 19, p = 0.003) where medium (G2) tussocks mostly featured (Figure 3). Tussock cover was generally similar in both areas, with both sites recording higher frequencies of medium (T2 and T3) than either high (T4) or low (T1) (Figure 4).

Neither tussock height nor tussock cover appeared to influence the occurrence of Jackson's Widowbird, because this species was highly mobile and hence difficult to determine microhabitat preference precisely in the duration of this study. However, this might not be the case during the breeding season when the species is known to prefer tussock grasslands for nesting (Bennun & Njoroge 1999).

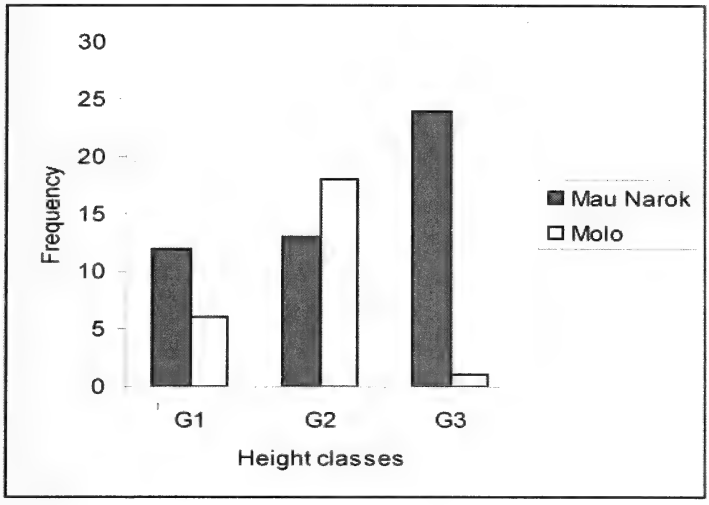

Figure 3: Tussock height variation in the Mau Narok-Molo Grasslands study sites

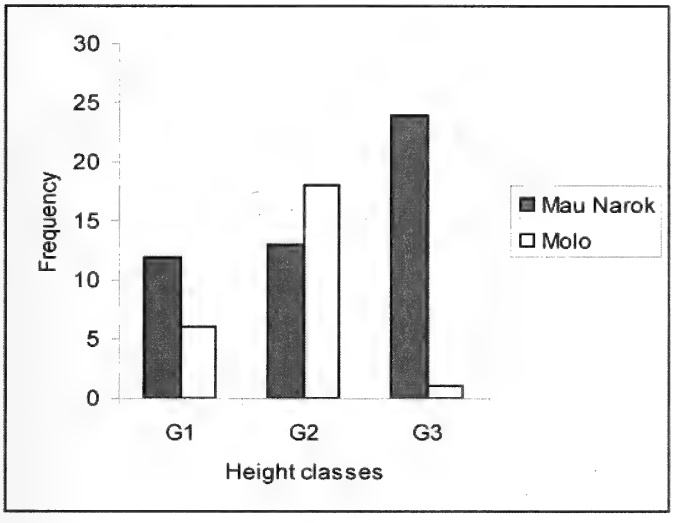

Figure 4: Distribution of tussocks in the Mau Narok-Molo Grasslands study sites

In the Mau Narok block, high quality (dense and relatively undisturbed) tussock grasslands now chiefly occur along river valleys. This is partly because large scale commercial wheat and barley cultivation is more common here, and heavy agricultural machinery cannot access these valleys. Additionally, the Maasai community is the dominant community and they traditionally value livestock rearing. As a result, they leave large, relatively intact patches of grassland for pasture. On several occasions, Jackson's Widowbirds were found performing courtship displays in these river valleys. Because wheat and barley cultivation is sometimes financially unpredictable, farmers may

make losses in some years after which some opt to leave their farms fallow for a while. It appears that tussock grasslands regenerate relatively fast in abandoned wheat fields.

In Molo, however, far fewer tussock grasslands occur compared to Mau Narok. The area is more densely settled by the small-scale agricultural-based communities. Because of the higher human population density, land parcels are ultimately smaller due to subdivision. Progressively smaller areas are therefore reserved for pasture (also mainly along river valleys), and more often than not, they are heavily grazed. Furthermore, fewer tussocks occur on these grasslands because they are considered unpalatable for livestock and hence selectively removed.

In summary, grasslands are disappearing at a fast rate and are being replaced by cultivation of mainly wheat, barley, and maize among other crops. Even though the Jackson's Widowbird exploits these crops for food, the loss of grassland habitat may have serious effects on the breeding success of the species, because it seems to require high quality grasslands for both courtship and nesting.

Acknowledgements

We are grateful to the farmers of Mau Narok and Molo who allowed us to access their farms. Staff and interns of Ornithology Department of NMK assisted in data collection, particularly Phillista Malaki and Berry Ochieng. We also thank the sub-chief of Olokurto division who was very instrumental and supportive during the survey. Prof. Ara Monadjem provided useful comments on an earlier version of the manuscript. Financial support for this study was provided by the African Bird Club (ABC). The Ornithology Department (NMK) provided equipment and logistical support.

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Appendix: The 30 commonest bird species based on the encounter rate across the 28 plots within the Mau Narok-Molo Grassland IBA during the study period

Common name	*Scientific name*	No of plots encountered	Number of encounters	Total No of individuals
Common Fiscal	*Lanius collaris*	27	51	141
Baglafetch Weaver	*Ploceus baglafecht*	21	65	111
Common Stonechat	*Saxicola torquata*	20	60	105
Grassland Pipit	*Anthus cinnamomeus*	19	73	186
Streaky Seedeater	*Serinus striolatus*	19	54	149
Hunter's Cisticola	*Cisticola hunteri*	16	44	112
Dusky Turtle Dove	*Streptopelia lugens*	16	43	87
Aberdare Cisticola	*Cisticola aberdare*	15	95	178
Ring-necked Dove	*Streptopelia capicola*	15	54	93
Rufous Sparrow	*Passer rufocinctus*	13	35	68
Red-capped Lark	*Calandrella cinerea*	11	63	99
Yellow Wagtail	*Motacilla flava*	11	20	28
Jackson's Widowbird	*Euplectes jacksoni*	10	28	1053
Capped Wheatear	*Oenanthe pileata*	9	24	44
Crowned Plover	*Vallenus coronatus*	8	14	46
Greater Blue-eared Starling	*Lamprotornis chalybaeus*	7	9	67
Speckled Mousebird	*Colius striatus*	7	10	27
Olive Thrush	*Turdus olivaceus*	7	14	25
Bronze Sunbird	*Nectarinia kilimensis*	7	11	11
Common Bulbul	*Pycnonotus barbatus*	6	9	47
African Citril	*Serinus citrinelloides*	6	10	20
Golden-winged Sunbird	*Nectarinia reichenowi*	5	8	22
Malachite Sunbird	*Nectarinia famosa*	5	5	10
Northern Anteater Chat	*Myrmecocichla aethiops*	4	16	41
Sharpe's Longclaw	*Macronyx sharpei*	4	6	12
Speke's Weaver	*Ploceus spekei*	3	6	27
Lesser Masked Weaver	*Ploceus intermedius*	3	4	22
African Mourning Dove	*Streptopelia decipiens*	3	6	11
Harlequin Quail	*Cortunix delegorguei*	3	3	3
Pin-tailed Whydah	*Vidua macroura*	3	3	3

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Status of the endangered Spotted Ground Thrush *Zoothera guttata fischeri* in coastal Kenya forests

P. Kariuki Ndang'ang'a, Ronald Mulwa and Colin Jackson

Spotted Ground Thrush *Zoothera guttata* is a rare, elusive and little-known bird species with a wide but discontinuous distribution. Severe threats in form of forest loss and fragmentation leading to rapid population decline have led to the species being classified as Endangered (BirdLife International 2000, 2007). Five races of the bird have been described, all existing in isolated patches of moist evergreen forest (Fry *et al.* 1997). Two are migratory and coastal, one (*Z. g. fischeri*) in Kenya, Tanzania, and probably Mozambique, and the other (*Z. g. guttata*) in South Africa. A resident race (*belcheri*) is found in Malawi, and two other races are known from single specimens in Sudan (*maxis*) and Democratic Republic of Congo (*lippensi*).

Z. g. fischeri is known only as a non-breeding visitor between late March and November to forests on the Kenya coast (Bennun 1992). Their breeding grounds were unknown for a long time until in the 1990s when birds with brood patches were caught in the forest on the Rondo Plateau in southern Tanzania (Holsten *et al.* 1991). There may be other breeding populations in Mozambique (Baker & Baker 1992). Past studies done in Kenya showed that their preferred habitat seemed to be a few tiny patches of thick coastal forests on coral rag soils, where they were recorded at high densities (Bennun 1985). However, because the coral rag forest patches are so small, Arabuko-Sokoke has been suspected to hold the bulk of the non-breeding population despite that fact that the species is known to occur at very low densities throughout the forest (Bennun 1992).

Information regarding the Spotted Ground Thrush in most Kenyan sites has been scanty and scattered, making it difficult to clearly understand its status in Kenya. Bennun (1985, 1987) did the only focussed studies on Spotted Ground Thrush in Kenya. In 1983 he did a short study assessing the species' status and general ecology at Gede Ruins forest. This was later followed up by a one-week ringing session in 1985. Further ringing was done at Gede Ruins and Arabuko-Sokoke forests in 1992. These studies suggested that the overall numbers of this species in Gede Ruins did not change between 1983 and 1992 (Bennun 1985, Bennun & Njoroge 1999). Bird surveys done in 1994 in the South Coast forest sites (Waiyaki 1995) also helped in giving an idea of the condition of forest sites where the species could be found at that time.

A long time had passed since these last bird surveys. This necessitated

follow-up surveys of the Spotted Ground Thrush forests at the Kenyan coast to assess the current status of the species and its forest habitat. International and national action plans for the species have been developed (Ndang'ang'a *et al.* 2005, Sande & Ndang'ang'a 2004). Highlighted under the aim of these plans is the need to improve the knowledge on the status of the species.

In this paper, we use the results of a rapid survey, past literature and other existing information to examine the conservation status of *Z. g. fischeri* on its non-breeding grounds in the Kenya coastal forests. We achieve this through re-assessing: (1) its current and probable changes in population, distribution and forest habitat status, and (2) existing conservation measures that benefit the species.

Study Area

Coastal forests in Kenya are generally distributed north and south of Mombasa, and occur as numerous fragments of wide-ranging sizes. The fragments are the remains of a once extensive and continuous, although heterogeneous forest mosaic block that extended from northern Mozambique in the south to southern Somalia in the north. As a result of development pressure, the block was fragmented into numerous forest fragments of a wide range of sizes. The forests are now a heterogeneous group of isolated evergreen or semi-evergreen closed-canopy forests, within 60 km of the Indian Ocean and usually on low hills rising to not more than 600 m (Waiyaki 1995).

The forests face various conservation problems, mostly associated with an increase in human population. These include: clearance for agriculture land and tourism development; removal of timber, poles and fuel wood, unfriendly forestry practices such as logging and replacement of indigenous forest; subsistence hunting; and breakdown of traditional conservation practices. Some of the coastal forests fall on private land. Others are Forest Reserves, either under full jurisdiction of the Forestry Department (FD) or within National Reserves and thus managed under a Memorandum of Understanding between the FD and the Kenya Wildlife Service (KWS). The rest are National Monuments administered by the National Museums of Kenya (NMK) under the National Monuments Act.

The survey was done in 10 Kenyan coastal forests in which Spotted Ground Thrush has been previously reported, or was suspected to be present (Figure 1, Table 1). Records were also provided for two additional sites (Vipingo and Mombasa) from other sources. Shimoni was only quickly assessed for its physical status through a two-hour visit. The three different fragments of Diani forests that were studied occurred under different ownership (Colobus Trust, Banana Farm and Baobab Beach Resort respectively), and were each visited separately. All except five of these forests have been identified as Important Bird Areas (IBAs), and each is described in detail by Bennun & Njoroge (1999).

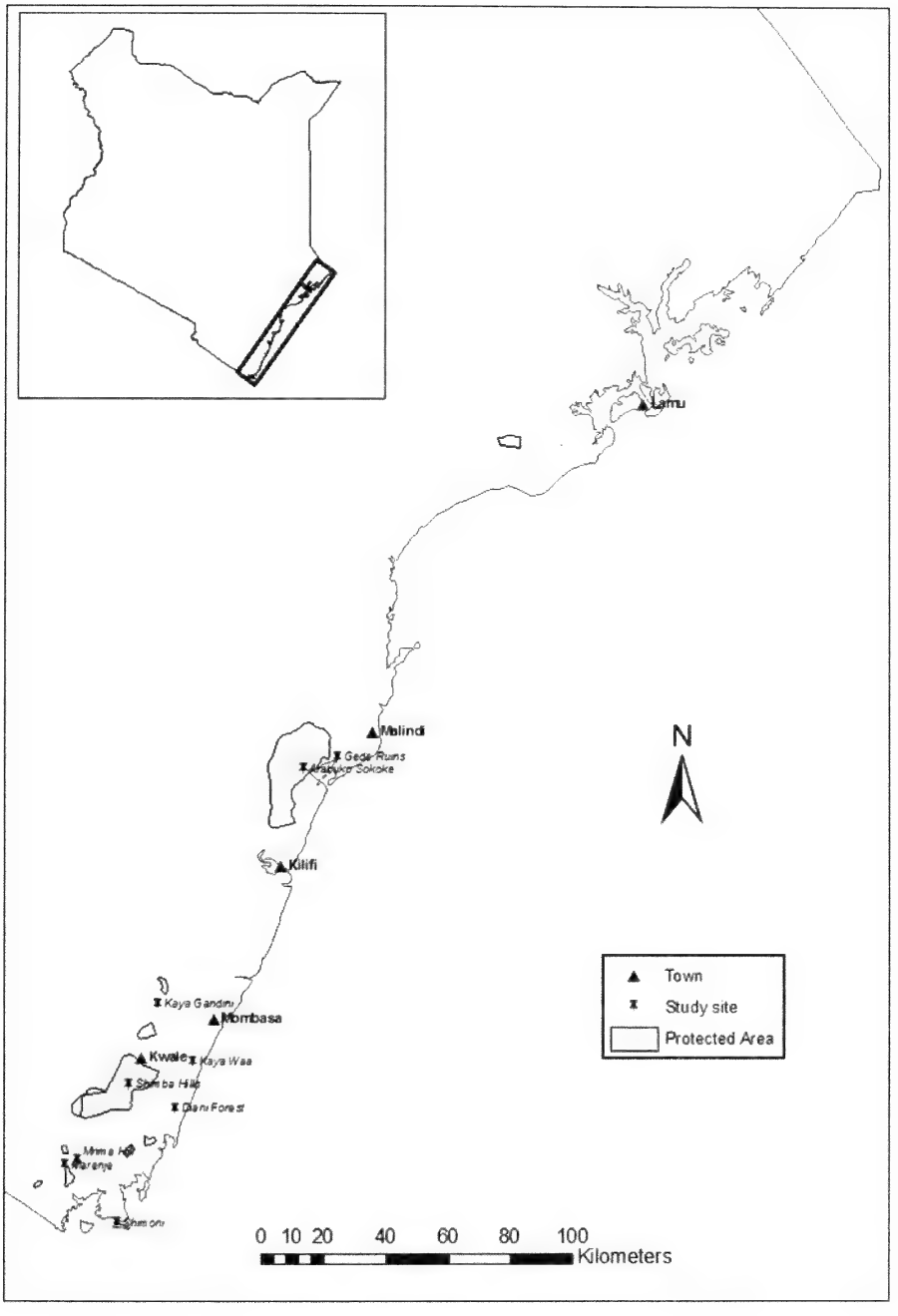


Figure 1: Location of study sites in Kenya

Table 1: Occurrence of Spotted Ground Thrush in surveyed sites

Site	IBA number.	Protection status
Gede Ruins****	KE 011	National monument
Arabuko-Sokoke****	KE 007	Forest Reserve/National Park
Diani****	KE 009	Private (Colobus Trust, Banana Farm and Baobab Beach Resort)
Mrima Hill****	KE 018	Forest Reserve/National monument
Vipingo****	Non-IBA	Private
Kaya Gandini****	KE 012	National monument
Mombasa****	Non-IBA	Private (Tamarind Hotel)
Shimba Hills***	KE 020	National Reserve
Shimoni**	Non-IBA	Private
Kaya Waa**	KE 013	National monument
Marenje *	Non-IBA	Forest Reserve
Kaya Diani*	Non-IBA	National Monument

**** Present: confirmed to be still present in 2003
*** Expected to be still present though not confirmed in 2003
** Known from old records, but unlikely to be present now
* Never been recorded but surveyed during this study

Methods

Surveys were carried out between 16 June and 20 July 2003 within the period when Spotted Ground Thrush is found on the forests of the Kenya coast as a non-breeding visitor. Additional information was collated from an on-going ringing programme at Arabuko-Sokoke forest, as well as from past literature.

In each of the study forests visited (except Shimoni), mist nets were used at sites distributed across the forested area. Choice of site was constrained by the availability of suitable small paths or trails and net lengths used varied. Every site was operated for three or four sessions before nets were moved to another site in the same or different forest. These sessions included one or two morning (06:00 - 11:00) and one or two evening (15:30 - 18:30) sessions. All species caught were aged and various biometrics and moulting details taken; in addition, all Spotted Ground Thrushes were colour-ringed.

Birds were also sought between 06:00 and 11:00 within random plots, each covering a radius of 30 m and beyond. One or two observers approached each of the plots quietly, and spent 10 minutes in the plot searching for all bird species. Movements by observers were minimised and particular emphasis was placed in looking for the Spotted Ground Thrush on the leaf litter all around the plot. Birds were detected by sight, call or listening to movements. The type of detection (whether by sight or by hearing) during bird searches was recorded for three other ground feeders in the forests: Red-capped Robin-chat *Cossypha natalensis*, Eastern Bearded Scrub Robin *Cercotrichas quadrivirgata* and Red-tailed Ant Thrush *Neocossyphus rufus*. Since Spotted Ground Thrush was not detected by hearing its call, the increased probability of detecting

other ground feeders from their calls was used to correct the crude density estimate for the Spotted Ground Thrush. Some plot counts (n = 20) done at Gede Ruins were combined with an initial 10-minute play back of song recordings of the race *Z. g. guttata* (from *Southern African Bird Sounds* by Guy Gibbon) in an attempt to attract Spotted Ground Thrush.

Observers also did targeted birding by walking around the forest making specific searches for the Spotted Ground Thrush, especially at places with habitat features that the bird are more likely to select, i.e. with areas of closed canopy providing deep shade, thick leaf litter and scant or patchy low vegetation (Bennun 1985). This was combined with the help of a knowledgeable local bird guide who was very familiar with the species.

To assess habitat preference, some habitat parameters were measured within most of the 30-m radius sample plots, and similar plots located at points where Spotted Ground Thrush was caught or seen randomly. The following habitat variables were assessed: slope estimated on a 0-3 scale; litter depth to the nearest 1 cm; percentage grass or herbal cover at the ground (0 - 1 m height), shrubs (plants 1 - 3 m in height), low trees (woody plants 3 - 8 m in height), high trees (woody plants >8 m in height), and entire canopy cover (portion covered by canopy of all woody plants >3 m in height) - all estimated from all the four compass directions; canopy height to the nearest 1 m; number of all cut stems; presence or absence of footpaths within the plot; relative horizontal density of low vegetation estimated based on the distance at which half of 10 x 10 cm black and white squares on a 50 x 50 cm chequered board could cease to be seen as the bearer of the board moved from the observer; and the occurrence of undergrowth tangle estimated on a 0-3 scale.

Results and discussion

Distribution

During the survey, Spotted Ground Thrush was only recorded in five of the 10 forests sites. These were: Gede Ruins, Arabuko-Sokoke (in the mixed forest near Gede), Diani (in Banana Farm), Mrima Hill, and Kaya Gandini (Table 1). Other records were also made in 2003 outside our survey period. On 3 June 2003 a ringed individual from southern Tanzania was found dead on the compound of Tamarind Hotel, Mombasa (Jackson 2004). Later in October 2003, after our study period, Norbert Rotcher (*pers. comm.*) also recorded Spotted Ground Thrush in a small privately owned forest patch in Vipingo, between Mombasa and Malindi. This suggests that relic and little-known patches of coral rag coastal forests within its range are still quite important for the species since it can use them as feeding grounds or for cover. In fact, records of birds had also been made in thickets at Bamburi near Mombasa (Britton & Rathbun 1978), suggesting that even non-forest habitats that provide adequate cover are important for this migratory thrush, and thus should be maintained.

In comparison, during birds surveys conducted between 1992 and 1994

in the south coast forests, Spotted Ground Thrush had been recorded in two more localities (Shimba Hills and Kaya Waa), but had similarly been missed in Marenje and Kaya Diani forests (Waiyaki & Bennun 2000). We did not survey Shimba Hills, and thus cannot rule out the possibility of existence of this species there. Compared to the situation in 1994 (Waiyaki & Bennun 2000), there was a notable decline in forest area (*c.* 80% loss by 2003) and quality at Kaya Waa due to human disturbance, with only *c.* 3 ha of good indigenous forest being left currently. It is thus probable that Spotted Ground Thrush now avoids this forest. Although we did not intensively search for the bird in Shimoni, it is probable that it has disappeared from the site due to habitat loss. We found the forest to have been subdivided among private developers and heavily cut down when we visited it, reducing the chances of survival for the species.

Our records were made at localities spread throughout most of the Kenya coast within the range of the species, suggesting that at a large scale its distribution may not have changed significantly. The occurrence of the species is unknown for dispersed localities such as Lamu and Kipini from where old records dating between 1870 and 1940 had been reported (Britton & Rathbun 1978). Access of coastal forests north of Malindi by birdwatchers and researchers has been limited by insecurity, and the lack of recent records from these sites could merely be due to the lack of opportunistic data. Further focussed surveys of the species in these forests are needed.

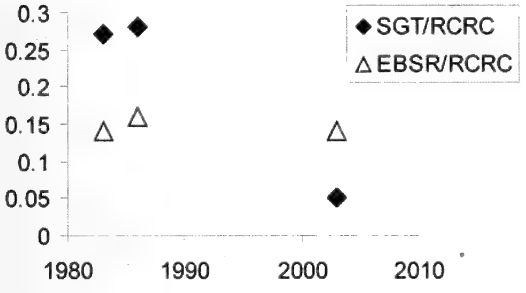
Population status

Of 329 plot counts carried out during the survey, Spotted Ground Thrush was observed only five times. Of these, one was in the Arabuko-Sokoke mixed forest, one in Diani (Banana Farm), two in Mrima Hill and one in Kaya Gandini. A further two observations were made from the targeted birding done in Arabuko-Sokoke Forest though one was seen near the same location as the plot count observation. Out of 516 birds mist-netted, only two were Spotted Ground Thrush. These were caught at Gede Ruins and Diani Forests (Banana Farm fragment) respectively. Both were sub-adults as indicated by some retained juvenile plumage, notably greater and median coverts, remiges and rectrices. Between 2001 and 2002, 11 ringing sessions were carried out within the non-breeding months of the species at a site within the mixed forest of Arabuko-Sokoke. A total of 256 birds were mist-netted and ringed of which only five were Spotted Ground Thrushes, caught over four sessions.

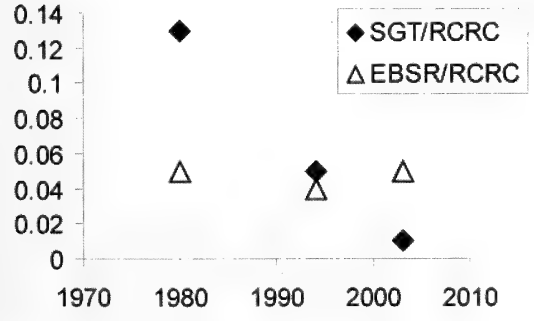
These data do not allow for proper calculation of the local population size of the species. We can only attempt to make predictions of population trends based on comparisons with past information. Here we use a comparison of the capture data in 2003 with that for Spotted Ground Thrush and two other ground-dwelling thrushes caught at Gede in 1983, 1986 (Bennun 1985, 1987), at five South Coast sites (Mrima Hill, Marenje, Kaya Gandini, Kaya Waa and Diani) in 1994 (Waiyaki 1995), and at two of the south coast forests

(Mrima Hill and Diani) in 1980 (Britton *et al.* 1980; Figure 2, Table 2). The proportions of captures at Gede in 1983 had remained virtually unchanged in 1986 (Bennun 1987) but had noticeably changed in 2003, with that of Spotted Ground Thrush relative to the other thrushes being approximately six times lower in 2003. Declines were also observed between 1980 and 1994 in the south coast sites. The proportion of Spotted Ground Thrush relative to the other thrushes in 1994 was approximately two times lower than in 1980, but declined at a higher magnitude between 1994 and 2003 to be four times lower. The proportion of the two other thrushes relative to each other, however, remained virtually unchanged over the two decades. The observed declines in proportions indicate an apparent continuing population decline of > 80% in the two decades for the Spotted Ground Thrush in the Kenyan coastal forests. These declines, however, appear to have been less severe in the 1980s but accelerated in the late 1990s.

Figure 2: Trends in proportions of Spotted Ground Thrush (SGT) over years in relation to two other forest thrushes: Eastern Bearded Scrub Robin (EBSR), an uncommon resident and the Red-capped Robin Chat (RCRC), a common intra-African migrant.



a) North coast forest (Gede Ruins)



(b) South coast forests

Table 2: Totals and ratios of individuals caught for three ground-dwelling thrushes at Gede in 1983 and 1986 (Bennun 1987), at South Coast (Mrima Hill, Marenje, Kaya Gandini, Kaya Waa, Diani) in 1994 (Waiyaki 1995), at two of the south coast forests (Mrima Hill and Diani) in 1980 (Britton *et al.* 1980) and at both places in 2003.

		Gede Ruins			South Coast		
Year		**1983**	**1986**	**2003**	**1980**	**1994**	**2003**
Total	*Cossypha natalensis*	37	32	22	38	142	73
	Cercotrichas quadrivirgata	5	5	3	2	6	4
	Zoothera guttata	10	9	1	5	7	1
Ratio	*Z. guttata/C. natalensis*	0.27	0.28	0.05	0.13	0.05	0.01
	Z. guttata/C. quadrivirgata	2.00	1.80	0.33	2.50	1.17	0.25
	C. quadrivirgata/C. natalensis	0.14	0.16	0.14	0.05	0.04	0.05

The seven records of Spotted Ground Thrush during the survey were only detected by sight or capture. This greatly reduced its detection probability as compared to other forest birds, most of which were more often detected by hearing their calls. The mean probability of detecting other ground feeding thrushes (Red-capped Robin Chat, Eastern Bearded Scrub Robin and Red-tailed Ant Thrush) by sight was much lower (0.16) than by hearing (0.84). Assuming that failure to detect Spotted Ground Thrush by hearing similarly reduced its detection probability, then its non-vocal behaviour reduced an observer's chance of detecting the species during counts by at least six times. In correcting for the reduced detectability of the bird, these counts thus give a crude population density estimate of one Spotted Ground Thrush per every 2 to 3 ha of good forest. Population densities of the species in Gede have previously been estimated to be as high as one bird per 0.3 ha based on the 1983 and 1986 studies (Bennun 1992) suggesting a major decline. This apparent decline in population density between 1983 and 2003 is consistent with the estimated > 80% decline in the past two decades above. On the contrary, forest cover and habitat features in the key Kenyan Spotted Ground Thrush sites (e.g. Gede Ruins and Arabuko-Sokoke forests) have not deteriorated in the same magnitude. In fact they have remained virtually unchanged over the past two decades. On the other hand, there is no evidence of recent change in the Rondo Plateau Forest breeding grounds in Tanzania (Baker and Baker 2002).

Comparisons between past and recent casual observations in the study area are also indicative of declines in the population of the species in various Kenyan coastal forests. In the 1970s many observers routinely reported 3 – 5 birds at Gede Ruins forest on a morning walk, suggesting that it occurred at higher densities (Britton & Rathbun 1978). Similarly, the staff of Gede Ruins who are familiar with the species reported seeing them almost daily and even foraging around the offices up until c.1995-6 (Hilary Mwachira *pers. comm.*). In comparison, none were reported casually during our 120 man-hours of search in the forest, or during other routine visits made by local bird guides

and bird watchers between 1998 and 2002. Similar trends are also illustrated by apparent reduced chances of seeing the species in Diani forest over years during casual visits between 1975 and 1990 (Burrel & Abel 1976, Irvine & Irvine 1977a & b, 1991).

Habitat preference

A simple comparison of vegetation features between the plots where the Spotted Ground Thrush was caught or seen and other random plots where it was not recorded (Appendix 1) showed that the plots where the species was recorded were characterised by: less herbal or grass cover at the ground level; less shrub cover; a more closed canopy; lower canopy height; lower tree density; higher visibility below as evidenced by longer chequer board visibility distances and less evidence of human disturbance as indicated by cut stems and foot paths. All except one (Diani, Banana Farm) of the sample plots where Spotted Ground Thrush was recorded were not flat. This is despite the fact that 50 % of all the random plots that were assessed for slope (n = 96) were flat. This could probably imply preference for slanting ground.

Most indications are that the bird is exclusively a ground feeder. In all (n = 7) except one of the observations we made, it was feeding on the ground. Past documented observations are consistent with this behaviour. It has been seen on the ground feeding on ants from a leaf-strewn roadway (Burrel & Abel 1976) and exploring leaf debris on the forest floor (Irvine & Irvine 1988). Fanshawe (1994) notes that it may emerge onto the paths at first light together with Red-capped Robin Chat and Eastern Bearded Scrub Robin.

In Arabuko-Sokoke Forest, although we surveyed the species in both mixed and *Cynometra* forests, we only managed to locate it in the mixed forest. The mixed forest was in the past dominated by the valuable timber tree *Afzelia quanzensis*, but decades of commercial logging for the tree means that other tree species now dominate the main canopy (KIFCON 1995). Past information strongly indicate that Spotted Ground Thrush had higher preference for the *Afzelia* (now mixed) and *Cynometra* than *Brachystegia* forest. Visits to the forest by Britton & Zimmerman (1979) indicate that the bird was recorded at least three times, but on fewer than 50% of the visits in *Afzelia* and *Cynometra* forests. In *Brachystegia* it was recorded only once or twice. Bennun & Waiyaki (1991) noted that Spotted Ground Thrush had been recorded from all habitats in Arabuko-Sokoke Forest but were very scarce, and seemed to prefer denser, shadier forest in *Afzelia* or *Cynometra*, being only rarely recorded in more open *Brachystegia*.

Previously it was apparent that Spotted Ground Thrush probably occurred at higher densities in Gede Ruins forest than Arabuko-Sokoke Forest (Britton & Rathbun 1978; Bennun 1985, 1987). Britton & Rathbun (1978) attributed this to the possibility that the accumulated detritus from the prolonged occupation of the historical city in Gede over a period of about 300 years might have significantly improved the feeding opportunities for this species (and influenced the composition of the forest trees), or equally well it might

favour wetter areas. In addition, unlike the Arabuko-Sokoke Forest, Gede Ruins are on coral rag, and it may in fact have a preference for the uneven ground characteristic of coral rag forests. However, the apparent declines in Spotted Ground Thrush densities in Gede Ruins over the past decade despite insignificant changes in habitat structure make this explanation doubtful.

Generally, the habitat conditions in most of Arabuko-Sokoke, Gede Ruins, Mrima Hill and Diani forests seemed to match the ostensible preference for the Spotted Ground Thrush, while those in Kaya Diani, Kaya Waa, Marenje and Shimoni did not. Conditions in Kaya Gandini had deteriorated compared to past observations, and although recorded here, the bird may soon disappear from this site.

Existing conservation measures

Production of International and National Action Plans for Spotted Ground Thrush (Sande *et al.* 2003, Sande & Ndang'ang'a 2004) is the most significant measure for conservation of Spotted Ground Thrush in Kenya. National Spotted Ground Thrush Action Plans for Kenya and Tanzania have been proposed and if implemented, will substantially benefit the conservation of East African Spotted Ground Thrush populations. Most of the proposed actions contained in these plans are, however, yet to be implemented due to lack of resources.

There are several other site-based conservation actions in place that may benefit the Spotted Ground Thrush. A strategic management plan for conservation of Arabuko-Sokoke forest now exists (ASFMT 2002). If implemented, this plan will be quite valuable for conservation of a significant area of the habitat. Arabuko-Sokoke Forest also benefits thrush's from conservation through an extremely successful butterfly-rearing project (KIPEPEO project) developed by Nature Kenya and National Museums of Kenya. The project has helped increase community revenue from-non-timber forest products and now operates profitably.

Apart from a few, most of the sites where the species can be found have some form of protection offered by Kenya Wildlife Service (KWS), Forest Department or National Museums of Kenya (NMK). In some instances, e.g. Gede Ruins, this protection has retained the forest habitat in suitable condition for the species, while in others human disturbance, although controlled, has continued to degrade the species' habitat, e.g. in Kaya Gandini and Mrima Hill. Since some of the national monuments are mostly conserved for their cultural and historical values some actions, e.g. clearing of under growth in Gede and creation of tourist trails, may not always be compatible with the conservation of Spotted Ground Thrush habitat. In addition all the sites where the species has been confirmed to exist in Kenya are recognised as Important Bird Areas (IBAs) and are to benefit from conservation actions scheduled under the IBA programme. These include the ongoing Darwin Initiative-funded Monitoring programme.

Recommendations

- Implementation of the already drawn Action plans for the species.
- Detailed surveys of the species at its breeding and non-breeding grounds in Tanzania, and if possible Mozambique, should be done to test whether the apparent population decline in Kenya could be related to changes in conditions outside Kenyan sites.
- More ringing of birds should be done in Kenyan and Tanzanian sites to increase the chances of recoveries that can provide information on movement patterns and possilbe causes of mortality.

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Appendix 1. Vegetation assessment in all visited forests, the points where *Z.g. fischeri* was recorded (SGT points), and where it was not recorded (non-SGT points).

		All	ASF (Cynometra)	ASF (mixed)	Diani	Gede Ruins	Kaya Diani	Kaya Gandini	Kaya Waa	Marenje	Mrima Hill	SGT points	non-SGT points
Canopy Ht (m)	N	171	8	13	16	25	18	29	5	16	41.0	7	164
	Mean	10.5	6.1	10.1	10.2	8.2	10.4	9.9	8.2	8.9	14.5	8.8	10.6
	Sd	4.2	1.1	2.1	4.1	2.0	3.8	2.8	0.7	1.8	5.2	2.5	4.3
No. of trees (>3 m ht)	N	162	8	13	16	23	17	29	5	17	34	6	156
	Mean	18.0	29.5	24.2	21.4	13.8	26.4	14.3	14.0	17.1	14.2	17.2	18.1
	Sd	11.3	13.5	16.5	5.9	9.7	20.1	7.1	4.2	5.9	4.7	7.1	11.5
No. of cut stems	N	164	8	13	16	25	18	26	5	17	36	6	158
	Mean	3.5	2.0	0.2	1.9	1.4	5.4	5.9	0.6	8.0	2.6	1.8	3.5
	Sd	7.7	2.6	0.6	2.1	2.1	18.7	6.1	1.3	9.1	3.0	2.6	7.8
% herb/grass cover (0-1 m)	N	168	8	12	16	23	18	29	5	17	40	6	162
	Mean	27.4	13.4	37.1	10.1	37.8	26.7	15.9	36.0	42.1	29.6	10.8	28.0
	Sd	23.8	15.2	20.7	17.9	29.6	23.2	13.4	20.7	28.5	21.2	10.2	24.0
% cover of shrubs (1-3 m)	N	135	8	13	16	17	14	28		15	24.0	6	129
	Mean	49.0	54.4	55.8	44.1	37.1	31.4	48.0		65.0	56.5	41.7	49.3
	Sd	25.5	21.1	24.5	21.8	24.6	27.9	28.3		22.2	18.6	27.9	25.4
% cover of low trees (3-8 m)	N	170	8	13	16	23	18	29	5	17	41	7	163
	Mean	59.1	75.0	73.5	68.4	55.2	55.3	56.4	60.0	57.6	54.0	68.6	58.7
	Sd	21.1	11.3	12.8	17.6	23.8	23.7	19.0	9.4	24.1	21.2	19.5	21.1
% cover of high trees (>8 m)	N	135	8	13	16	17	14	28		15	24.0	6	129
	Mean	34.8	9.4	46.9	31.3	39.1	42.5	34.6		24.7	37.9	41.7	34.5
	Sd	23.3	9.8	22.1	26.4	25.1	28.3	21.6		14.2	20.5	28.6	23.1
% canopy cover	N	171	8	13	16	25	19	29	5	17	39	7	164
	Mean	68.3	64.2	70.1	81.5	65.7	80.3	58.8	70.3	55.7	71.4	78.9	67.9
	Sd	16.1	13.4	8.5	10.9	12.3	9.3	20.4	4.9	19.7	11.8	10.9	16.1
Board distance (visibility)	N	139	8	13	15	25	13	27		15	23.0	5	134
	Mean	4.9	4.1	5.0	5.9	5.9	4.5	4.4		4.1	4.7	5.5	4.9
	Sd	1.7	1.0	1.3	1.8	1.4	1.5	2.0		1.7	1.5	1.8	1.7

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Birds of Ndere Island National Park, Lake Victoria Kenya: A preliminary survey

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Ndere is a remote island off Lake Victoria, Kenya. It was gazetted as a National Park, under the Kenya Wildlife Service (KWS) in 1986. Ndere Island National Park (NINP) is one of the seven national parks and reserves that constitute the western Kenya tourism circuit. The island's flora and fauna had never been explored in detail prior to this study, a factor that could limit targeted conservation planning and tourism.

We surveyed NINP in October-November 2004 to provide baseline scientific information on the flora and fauna of the island. In this paper we specifically provide results on the ornithological aspects of the expedition. In particular, baseline data on bird species occurrence, richness and relative abundance within the island were collected.

Study Area

Ndere Island National Park (NINP) is a small island covering about 4.2 km^2, off the northern shore of the Winam Gulf of Lake Victoria. It is about 2 km off Kamuga-Asembo shores and about 40 km west of Kisumu City. Overall, NINP is undeveloped except for two campsites and a network of (walking) trails.

Originally, Ndere Island was owned by the local Luo community living on the nearby mainland. It was popular for farming and as a source of firewood, thatching grass and other building materials for the community. Utilization of the resources was always restricted in respect of the Luo's cultural values of the island. Since its designation as a National Park, the policy has been to safeguard the island from use, destruction and degradation. Consequently, the park has naturally regenerated to a beautiful island with wooded shoreline and an open summit covered by tall grasses.

The island has four major habitat types for birds: (1) grasslands (tall, short, burnt), (2) woodland (with some bush), (3) woodland-grassland (woodland interspersed with some grassland patches), and (4) lake shoreline (island edge).

Methods

Different methods were used to assess the birds in the four main habitat types in the park. In the woodland, grassland and wooded grassland habitats, birds were surveyed using Timed Species Counts (TSCs) (Bibby *et al.* 1998). Each

TSC lasted for 40 minutes in which species were observed in four blocks of ten minutes each. Only new species, not seen during the preceding time intervals were recorded. It was assumed that common species were likely to be encountered faster (hence report more sightings in the first or second 10-minutes time intervals) than rarer ones (that were more likely to be reported infrequently, and more so in the third or fourth time internals). This approach allowed the ranking of species where species seen in the first 10 minutes were given a rank of 4, and those in seen in the last ten minutes, a rank of 1. This provided a reliable measure of species relative abundance. Observers walked randomly around the habitat types, listing all species seen or heard within that habitat regardless of how far away they were. Species flying over were included only if they were deemed to "use" that habitat; for instance, swallows feeding, kites looking for food or raptors displaying within the habitat under survey. Fourteen, eight and 12 TSCs were undertaken in the woodland, grassland and wooded grassland habitats respectively. The relative abundance rank for each species was calculated as the total rank scores for that species divided by the number of TSCs ran in that habitat. All TSCs were done between 06:30 and 11:00 when birds were expected to be most active.

For the water birds one total count was done along the shoreline and water edge of the island. Observers on a motorboat moved at a slow speed around the entire island and counted the number of individuals of each water bird species encountered along the shore.

In addition to species information obtained from the above methods, observers spent time bird watching to come up with a comprehensive checklist of the bird species of NINP. These were done casually to cover all the different types of habitats. Additional techniques for recording difficult species were used, e.g. play backs, listening for nocturnal species, and *ad hoc* mist-netting. A comprehensive list of birds seen during the survey period was compiled.

Results and Discussion

Bird list and records

A total of 133 bird species were recorded from the island. Due to its diversity of habitats, NINP is home to a relatively large number of bird species despite its small size. Five species were new records or species for which only old records (before 1970) were known for the Quarter-square-degree (QSD) 60b (Lewis & Pomeroy 1989) in which the island falls (Appendix 1). An additional three species (Pennant-winged Nightjar *Macrodipteryx vexillarius*, Leivallant's Cuckoo *Oxylophus levaillantii* and Eurasian Cuckoo *Cuculus canorus*) of national interest (Ornithological Sub-committee 1996) were recorded.

Birds in the different habitat types

Different habitats showed distinct bird species compositions with the Grey-backed Camaroptera *Camaroptera brachyura* and Blue-spotted Wood Dove *Turtur afer*, White-throated Bee-eater *Merops albicollis*, Black-headed Gonolek *Laniarius erythrogaster* and Pied Kingfisher *Ceryle r. rudis* being the

most common species in the woodlands, grasslands, wooded-grassland and shoreline habitats, respectively (Appendix 1).

Nine Forest generalists (F – birds that may occur in undisturbed forest but are also regularly found in forest strips, edges and gaps) and 27 Forest visitors (f – birds often recorded in forest, but are not dependent upon it (Bennun *et al.* 1996) were recorded (Appendix 1). The presence of the forest generalists is an indication of the presence of a secondary forest, especially in the north-western part of the island where the woodlands tended to be thicker, taller and wetter within a small area (*c.* 4 ha). The grasslands held quite a number of grassland-dependent species including Rattling Cisticola *Cisticola chiniana*, Yellow-throated Longclaw *Macronyx croceus* and Flappet Lark *Mirafra rufocinnamomea*, all which were fairly common (Appendix 1). Family Alcedinidae were notably well represented in the island, with seven out of the 11 kingfisher species known in Kenya recorded.

Global conservation importance of NINP

We recorded several species of global conservation concern during our survey:

- Pallid Harrier *Circus macrourus*, a Globally Near-Threatened species (BirdLife International 2004)
- Three of the nine Lake Victoria Basin Biome species (Bennun & Njoroge 1999) were seen: Black-lored Babbler *Turdoides sharpei*, Red-chested Sunbird *Nectarinia erythrocerca* and Northern Brown-throated Weaver *Ploceus castanops*. Expectedly, other biomes were represented by a lower proportion of the species, with only three out of 92 Somali-Masai Biome species and one out of 67 Afrotropical Highlands Biome species seen
- In total, 22 Palearctic and 10 Afrotropical-Malagasy migrants were recorded inside the park. Migrants were especially common in the grasslands where the White-throated Bee-eater, Barn Swallow *Hirundo r. rustica* and Pallid Harrier *Circus macrourus* were abundant. Willow Warbler *Phylloscopus trochilus* was also fairly common throughout the island, while Yellow Wagtail *Motacilla flava* occurred in large groups wherever they were seen, especially in the short-burnt grasslands.

Importance for roosting

A large group (*c.* 500) of Barn Swallows was observed one morning flying around a tall grassland patch by the lake shore on the island. It is possible that the island is used by some Barn Swallows for roosting during their non-breeding visit to Kenya. No roosting sites for water birds were observed in the island, and water bird numbers of the shores were generally low compared to other wetlands in the country.

Threats to the island's avifauna

Being a protected area, there were no major human-induced threats to the island bird habitats. However, there were potential threats associated

with illegal cutting of wood and grass, and the general perception by the surrounding community that the park's management was denying them access to resources within the island. This was seen to represent a loss of opportunity for the community who gave up their land in the hope that they would later start benefiting from its protection. While not posing problems currently, these sentiments need to be nipped in the bud before they develop into real conservation issues.

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Appendix 1. Checklist of birds recorded in Ndere Island National Park and the habitats they were reported in. TSC results for grassland, woodland, wooded-grassland habitats and total count results for the shoreline are included. Species recorded outside TSCs and shoreline counts are marked 'x'.

Common name	Scientific name	Grassland TSC	Woodland TSC	Wooded Grassland TSC	Shoreline Total count	*Cat.	Migration status
Great Cormorant	*Phalacrocorax carbo*				x	nf	
Long-tailed Cormorant	*P.africanus*				25	nf	
Cattle Egret	*Bubulcus ibis*				x	nf	am
Little Egret	*Egretta garzetta*				5	nf	
Green-backed Heron	*Butorides striatus*		0.3		3	nf	
Hammerkop	*Scopus umbretta*	0.5	0.2	0.9	3	nf	
Black Stork#	*Ciconia nigra*			0.3		nf	pm
African Open-billed Stork	*Anastomus lamelligerus*			0.3		nf	
Yellow-billed Stork	*Mycteria ibis*		x			nf	
Hadada Ibis	*Bostrychia hagedash*	0.1		0.2		nf	
Egyptian Goose	*Alopochen aegyptius*		0.6			nf	
Osprey	*Pandion haliaetus*	0.3				nf	pm
Black Kite	*Milvus migrans*	1.3	0.6	1.2		nf	am,pm
Banded Snake Eagle	*Circaetus cinerascens*		0.1			F	
African Harrier Hawk	*Polyboroides typus*		0.1			f	
Pallid Harrier	*Circus macrourus*	1.5		0.6		nf	pm
Montagu's Harrier	*C. pygargus*	x				nf	pm
Eurasian Marsh Harrier	*C. aeruginosus*		0.1			nf	pm
Common (Steppe) Buzzard	*Buteo buteo*	x				nf	pm
African Fish Eagle	*Haliaeetus vocifer*	0.1	1.4	2.1	2	nf	
Verreaux's Eagle	*Aquila verreauxii*		x	x		nf	
Booted Eagle	*Hieraaetus pennatus*		x			nf	
Long-crested Eagle	*Lophaetus occippitalis*			0.3		nf	
Crested Francolin	*Francolinus sephaena*	0.4	0.5	0.8		nf	
Helmeted Guineafowl	*Numida meleagris*	x		x		nf	
Black Crake	*Amaurornis flavirostris*				x	nf	

Common name	Scientific name	Grassland TSC	Woodland TSC	Wooded Grassland TSC	Shoreline Total count	*Cat.	Migration status
African Jacana	*Actophilornis africanus*				x	nf	
Black-winged Stilt	*Himantopus himantopus*				x	nf	am
Common Sandpiper	*Actitis hypoleucos*				25	nf	pm
Whiskered Tern	*Chlidonias hybridus*				3	nf	pm
White-winged Tern	*C. leucopterus*				3	nf	PM
African Green Pigeon	*Treron calva*	0.5				F	
Tambourine Dove	*Turtur tympanistria*		0.1			F	
Blue-spotted Wood Dove	*T.afer*		3.0	2.3		F	
Namaqua Dove	*Oena capensis*		0.5			nf	
Red-eyed dove	*Streptopelia semitorquata*		0.1			f	
African Mourning Dove	*S. decipiens*	1.0	0.6	1.8		nf	
Laughing Dove	*S. senegalensis*		0.4	0.3		nf	
Eastern Grey Plantain-eater	*Crinifer zonurus*		1.2	0.6		nf	
Levaillant's Cuckoo	*Oxylophus levaillantii*		0.1			f	X
Eurasian Cuckoo	*Cuculus canorus*		0.3	0.3		nf	X,PM
African Emerald Cuckoo	*Chrysococcyx cupreus*		x			F	
Klaas's Cuckoo	*C. klaas*	0.4	0.8	0.6		f	
Diederik Cuckoo	*C. caprius*			0.4		nf	
White-browed Coucal	*Centropus superciliosus*	1.6	1.7	2.7		nf	
Pennant-winged Nightjar	*Macrodipteryx vexillarius*	0.1	0.2			nf	X,AM
African Palm Swift	*Cypsiurus parvus*	1.1		0.3		nf	
Eurasian Swift	*Apus apus*	x				nf	PM
Mottled Swift	*A. aequatorialis*	0.1				nf	
White-rumped Swift	*A.caffer*	0.6		0.6		nf	
Little Swift	*A.affinis*	0.1		0.3		nf	
Speckled Mousebird	*Colius striatus*	1.7	1.7	1.2	1	nf	
Blue-naped Mousebird	*Urocolius macrourus*		0.6	0.9		nf	
Grey-headed Kingfisher	*Halcyon leucocephala*	1.1		1.0		f	am

Common name	Scientific name	Grassland TSC	Woodland TSC	Wooded Grassland TSC	Shoreline Total count	*Cat.	Migration status
Woodland Kingfisher	*H.senegalensis*	0.1	0.5	0.8		nf	
Striped Kingfisher	*H. chelicuti*	0.3		0.3		nf	
Malachite Kingfisher	*Alcedo cristata*		0.2		19	nf	
African Pygmy Kingfisher	*Ispidina picta*			0.3		f	am
Giant Kingfisher	*Megaceryle maxima*		0.1			nf	
Pied Kingfisher	*Ceryle rudis*		0.4	0.5	114	nf	
Eurasian Bee-eater	*Merops apiaster*	0.4		1.3		f	PM
White-throated Bee-eater	*M.albicollis*	3.1	1.6	2.3	1	f	am
Eurasian Roller	*Coracias garrulus*	0.1		0.5		nf	PM
Broad-billed Roller	*Eurystomus glaucurus*		0.1			f	am,mm
African Grey Hornbill	*Tockus nasutus*		0.1	0.4		nf	
Red-fronted Tinkerbird	*Pogoniulus pusillus*	1.1	2.0	2.7		nf	
Yellow-fronted Tinkerbird	*P. chrysoconus*	0.1	1.4	2.2		nf	
Spot-flanked Barbet	*Tricholaema lacrymosa*	0.6	0.5	0.3		nf	
White-headed Barbet	*Lybius leucocephalus*			0.7		nf	
Cardinal Woodpecker	*Dendropicos fuscescens*		0.5	0.6		f	
Flappet Lark	*Mirafra rufocinnamomea*	0.9	0.3	0.8		nf	
Plain Martin	*Riparia paludicola*	1.3	0.9	1.3		nf	
Sand Martin	*R. .riparia*	1.2		0.9	5	nf	PM
Barn Swallow	*Hirundo rustica*	2.4	1.6	2.5		nf	
Red-rumped Swallow	*H. daurica*	0.3				nf	
Lesser Striped Swallow	*H. abbysinica*	0.3				nf	
African Pied Wagtail	*Motacilla aguimp*				1	nf	
Yellow Wagtail	*M. flava*	0.6	0.3	0.3	1	nf	PM
Grassland Pipit	*Anthus cinnamomeus*	1.1				nf	
Plain-backed Pipit	*A. leucophrys*	0.1	0.1			nf	
Tree Pipit	*A. trivialis*	0.5				f	PM
Yellow-throated Longclaw	*Macronyx croceus*	1.8		0.4		nf	

Common name	Scientific name	Grassland TSC	Woodland TSC	Wooded Grassland TSC	Shoreline Total count	*Cat.	Migration status
Little Greenbul#	*Andropadus virens*		1.0	0.9		F	
Yellow-throated Leaflove	*Chlorocichla flavicollis*		1.5	1.0		f	
Common Bulbul	*Pycnonotus barbatus*	1.8	1.6	1.9	1	f	
Black-lored Babbler	*Turdoides sharpei*	0.3		0.3		nf	
Red-capped Robin-Chat#	*Cossypha natalensis*			0.3		F	
White-browed Robin-Chat	*C. heuglini*		1.6	0.7		f	
White-browed Scrub Robin	*Cercotrichas leucophrys*	0.8	1.5	1.5		nf	
African Thrush	*Turdus pelios*	0.3	0.1	0.5		f	
Spotted Flycatcher	*Muscicapa striata*	x	x	x		nf	PM
Swamp Flycatcher	*M. aquatica*		0.4		13	nf	
Pale Flycatcher	*Bradornis pallidus*		0.4			nf	
Olivaceous Warbler	*Hippolais pallida*			0.3		nf	PM
Olive Tree Warbler	*H. olivetorum*			0.1		nf	
Willow Warbler	*Phylloscopus trophilus*	1.4	2.0	1.1		f	PM
Red-faced Cisticola	*Cisticola erythrops*		0.6			nf	
Winding Cisticola	*C. galactotes*			0.2		nf	
Rattling Cisticola	*C. chiniana*	2.6	0.3	2.1		nf	
Zitting Cisticola	*C. juncidis*	0.1				nf	
Grey-backed Camaroptera	*Camaroptera brachyura*	0.5	3.0	2.7		f	
Grey-capped Warbler	*Eminia lepida*	0.1		0.7		nf	
African Paradise Flycatcher	*Terpsiphone viridis*	1.6	1.2	0.7	2	f	am
Common Wattle-eye	*Platysteira cyanea*	0.1	1.0	1.4		f	
Red-tailed Shrike	*Lanius isabellinus*	0.5	0.6	0.7		nf	PM
Brubru	*Nilaus afer*			x		nf	
Black-headed Gonolek	*Laniarius erythrogaster*	1.1	2.0	3.1	2	nf	
Northern Puffback	*Dryoscopus gambensis*		0.8	0.3		F	
Black Cuckoo Shrike	*Campephaga flava*	1.0	0.1	1.0		f	am
Common Drongo	*Dicrurus adsimilis*			x		nf	

Common name	Scientific name	Grassland TSC	Woodland TSC	Wooded Grassland TSC	Shoreline Total count	*Cat.	Migration status
Eurasian Golden Oriole	*Oriolus oriolus*	0.1	0.5			f	PM
Green-headed Sunbird	*Nectarinia verticalis*		0.1			F	
Scarlet-chested Sunbird	*Nectarinia senegalensis*	1.3	2.4	0.8		nf	
Marico Sunbird	*Nectarinia mariquensis*			0.3		nf	
Purple-banded Sunbird	*Nectarinia bifasciata*		0.1			f	
Red-chested Sunbird	*Nectarinia erythrocerca*		0.6	0.4		nf	
Copper Sunbird	*Nectarinia cuprea*	0.9	0.1	0.5		f	
Baglafecht Weaver	*Ploceus baglafecht*		0.4			nf	
Slender-billed Weaver	*Ploeus pelzeni*	2.0	2.4	1.2	1	f	
Spectacled Weaver	*P. luteolus*	0.3	0.3	0.5		f	
Holub's Golden Weaver	*P. xanthops*	0.1				nf	
Northern Brown-throated Weaver	*P. castanops*	0.4		0.2		f	
Yellow-backed Weaver	*P. melanocephalus*	0.4	0.4			nf	
Lesser Masked Weaver	*P. intermedius*	0.3	0.1	0.1		nf	
Speke's Weaver	*P. spekei*			0.1		nf	
Black-headed Weaver	*P. cucullatus*	0.6	0.2	0.3		nf	
Yellow-mantled Widowbird	*Euplectes macrourus*		0.1			nf	
Brown Twinspot#	*Clytospiza monteiri*		x			f	
Red-billed Firefinch	*Lagonosticta senegala*	0.6		0.4		nf	
Common Waxbill	*Estrilda astrild*	x		x		nf	
Bronze Mannikin	*Lonchura cucullata*	0.5				nf	
Yellow-fronted Canary	*Serinus canicollis*			0.4		nf	
Cinnamon-breasted Rock Bunting#	*Emberiza tahapisi*	0.4				nf	

#New species to the Quarter-square-degree (QSD) **60b** in which the island falls (Lewis and Pomeroy 1989);
Migration status based on OSc (1996): AM = Afro-tropical migrants; PM = Palearctic migrants; MM = Malagasy migrants: where these letter are in lower case, that migrant occurs alongside resident or non-migratory individuals;
***Forest dependence categories** based on Bennun *et al.* (1996), where: Forest-dependent (FF) = 'true' forest birds, characteristic of the interior of undisturbed forest species; Forest generalists (F) = birds that may occur in undisturbed forest but are also regularly found in forest strips, edges and gaps; Forest visitors (f) = birds often recorded in forest, but are not dependent upon it; and Non-forest (nf) = birds that may not depend on the forest

Short communications

Observation of African Stonechat *Saxicola torquata albofasciata* in Mgahinga National Park, south-western Uganda

During a two-week bird-watching trip to south-western Uganda, we took the photo below of an African Stonechat *Saxicola torquata* along the northern border of Mgahinga National Park (01°21'S, 29°36'E) on 5 September 2006. In the field we were not immediately aware of the different plumage of the bird, compared to the plumages of other African Stonechats we had previously observed during the trip. From Kibale Forest south to Mgahinga birds were identified as belonging to the subspecies *axillaris* in having a very restricted rufous patch on the breast, with lower breast, sides of the breast, flanks and belly all pure white (Stevenson & Fanshawe 2004, Urquhart 2002).

Whilst looking at the pictures more closely later, we realised that the bird from Mgahinga was different: chin, throat and breast are predominantly black (Figure 1, please contact RF or Editor for colour pictures). Some chestnut feathers on the breast, the black mottled flanks and the uneven demarcation of the black breast indicate that it concerns a first year male of the subspecies *albofasciata* (Urquhart 2002). On seeing the photos Mr. E. Urquhart indeed supported this opinion (pers. comm.). Other plumage characteristics discernable from our photos were a yellowish base of the lower mandible, the rather glossy black plumage and some white on the outer tail feathers.

Figure 1. African Stonechat *Saxicola torquata albofasciata* photographed in Mgahinga National Park, 5 September 2006 (R. Felix).

Saxicola torquata albofasciata occurs in the western and south-eastern highlands of Ethiopia, at higher elevations in the Rift Valley, in southeast Sudan and in extreme northeast Uganda. It is a montane species occurring mostly at 2440-3050 m a.s.l. Subspecies *axillaris* occurs in large parts of Uganda, Rwanda, Burundi, DRC,

central-west Kenya and northern Tanzania (Urquhart 2002, Stevenson & Fanshawe 2004, Del Hoyo *et al.* 2005).

The bird we photographed was in a pair. Both birds were alarming fanatically when approached, with the male also wing-flicking. However, we did not see fledged juveniles or any other behaviour that would have indicated presence of a nest. The habitat in the area consisted of typical open scrub with isolated trees and bushes. Considering the fact that the birds were paired and behaved territorially, we guess that this was a pair of possibly locally breeding birds rather than post-breeding migrants from elsewhere. If so, this would imply an expansion of the known range of the subspecies *albofasciata*. Likewise, this subspecies was also recently recorded outside its known range in Kenya and Tanzania (E. Urquhart, B. Finch, pers. comm.).

However, the taxonomic status of *axillaris* and *albofasciata* remains far from clear. Some authors suggest a firm link between the two, because of a high amount of variation in the extent of black on the breast in *axillaris* (Urquhart 2002). There are specimens of *axillaris* from Kenya in the British Museum of Natural History that show virtually no chestnut on the breast which is entirely black. The question therefore arises whether these are incorrectly labelled and should be classified as specimens of the *albofasciata* race instead (E. Urquhart, pers. comm.).

Additional observations of breeding behaviour and detailed descriptions of plumage characteristics of Stonechats in eastern Africa are required to establish more precisely the distribution patterns of the two subspecies, and recent changes, if any. Besides, since local studies on Stonechats are still rare, anecdotal data from visiting birdwatchers may well contribute to clarify the situation. Worldbirds™ (a joint initiative by BirdLife International, the RSPB and Audubon), which collates (anecdotal) data collected from birders around the world can be useful for this purpose.

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First Ethno-ornithology meeting held in Kenya

Kenya is endowed with one of the highest bird diversity in Africa. With about 1,089-recorded species, the country is only second to the Democratic Republic of Congo in the continent. This high diversity is attributed to a mosaic of different habitats with varying vegetation, altitude, landform and rainfall. Kenya is in addition endowed with a rich diversity of human cultures as a result of a high diversity of ethnic groups. These communities have over millennia associated with birds and their habitats, a relationship, which has resulted in a rich indigenous knowledge about birds.

For a long time, research in birds has often been conducted without the social-cultural component. Local community involvement in bird-related research and conservation programmes is, at best, rare. Documentation of indigenous knowledge related to birds continues to lag behind those of other disciplines such as plants. On the whole, the entire field of birds and people is still unexplored in spite of its great potential in supplementing our conservation efforts and application in improving the quality of people's lives. Understanding and adopting local knowledge on birds will not only provide us with more tools for biodiversity conservation, but could also provide novel means for fight hunger and malnutrition, bringing additional income to local communities and thus improving local and national economies.

An Ethno-ornithology meeting, the first of its kind in Kenya, took place at the National Museums of Kenya on 22 October 2007. The five main objectives of the meeting were:

- Identifying stakeholders and interested parties (institutional, individual etc)
- Discussing ethno-ornithology and its relevance in the conservation of birds and Important Bird Areas (IBAs) (habitats), and livelihoods
- Prioritising future activities related to ethno-ornithology in the region
- Developing a plan of action that takes into account potential projects and programmes, resources needed and potential sources and key players
- Discussing and mapping a way forward for ethno-ornithology.

The outcomes of the meeting are being collated and a summary will be provided in a future edition of *Scopus*. Watch this space!

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Book reviews

Migrating raptors of the world: their ecology and conservation. Bildstein, K.L. 2006. 320pp and 8pp colour photographs. London: Cornell University Press. £19.95/$30.00.

This is an easy-to-read introduction to a large literature on raptor migration. So there are plenty of references to cross check but not too many tables and graphs. The eclectic mix of chapters covers origins of raptor migration, origins of raptor migration study, details of migration and where to see raptors migrating (complete with pictures of "hawkwatchers"). I was surprised to learn that 202 of the world's 307 raptors have migratory tendencies. These are divided into irruptive/local, partial and complete migrants (in which 90 % of individuals migrate). There's not much in here about migrations within Africa and the perspective is very much New World despite African-Palearctic raptors accounting for 16 of the world's 22 complete migrants and only five being in the Americas. Six great "hawkwatch" sites are in the US, two more elsewhere in the Americas and 5 in the western Palearctic, apparently. The final, conservation chapter, comforted me to know that only one raptor is known to gone extinct in the last 300 years: the sedentary Guadalupe Caracara. This is a book for raptor enthusiasts.

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The bird of Sao Tome and Príncipe with Annobón: islands of the Gulf of Guinea. Jones, P. & Tye, A. BOU Checklist Series: 22. 172pp and 16pp colour pictures. Oxford: British Ornithologists' Union. £30.00.

It is surprising how little attention these islands attract given the number of endemic and threatened species they harbour. They are their own Endemic Bird Area and have significant endemic flora, herptiles and mammals, which also get a mention in this volume. Between the three islands, there are some 28 endemic bird species and a further 13 mainland birds with an endemic subspecies. Twelve are considered threatened. This is therefore a deserving avifauna for an up-to-date treatment. The 42-page introduction is thorough and detailed with tables summarizing key features of the avifauna such as migrants, colonisations and extinctions. For key species the accounts include information on habits, breeding, morphology and systematics as well as status and range, making this much more than just a checklist. Breeding species tend to have up to a page devoted to them, sometimes more. This is possible with an avifauna which, despite being diverse by island standards, is still

quite small (e.g. 50 breeding land birds on São Tomé). Records are dealt with separately for each of the islands where appropriate. All of the colour pictures illustrate sites and habitats around the islands so the cover drawings are the only hint of what some of the endemic birds look like (see *Birds of western Africa* Borrow & Demey 2001 Helm for fieldguide coverage of the islands). A summary checklist (with summary distributional information) and gazetteer are provided in appendices. This is now the standard reference for these islands and a nicely produced one too.

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Waterbird Population Estimates – Fourth Edition. Delany, S. & Scott, D. (Eds) 2006. 239pp. Wageningen: Wetlands International

The 4th edition of the Waterbird Population Estimates series is probably the most authoritative and up-to-date document on waterbird numbers and distribution today. The opening pages of the 239-page treatise contain a well distilled executive summary, a brief description on methodologies used and an elucidation on how to use the book. The text, maps, graphs and bird photos which are presented in a mosaic of colours, make it an easy to read and an attention-grabbing document. The book ends with a reference section of all information reviewed and a meticulous appendix of common names and scientific names which make a search for a specific species or facts simple and rapid. This publication identifies 2,305 bio-geographical populations of all 878 waterbird species globally, provides an estimate of the abundance of 79 % of these populations, as well as assessing population trends (whether declining, stable or increasing) for 52 % of them. The document contains comprehensive and well-presented geographical distribution maps for over 90 % of all the waterbird species. It further pools together existing population estimates of the world's waterbirds which enables the setting of the 1 % thresholds that are to be used in the application of Criterion 6 in the designation of wetlands of international importance under the Ramsar Convention. It also provides information fundamental to the conservation of waterbirds under inter-governmental initiatives such as the African-Eurasian Migratory Waterbird Agreement (AEWA). For scientists, it guides future research prioritization by identifying knowledge gaps for specific populations, species, and geographical regions, besides highlighting declining species. Besides being of use to persons interested in waterfowl research and conservation, the book can double up as a planning guide for keen bird watchers, enabling them to select locations of choice to see magnificent congregations of waterbirds such as Lesser Flamingo *Phoenicopterus minor*, or rare and charismatic species such as the Chatham Oystercatcher *Haematopus chathamensis*. In sum, the document collates the most up-to date information on the conservation status of waterbird species globally into a single volume. This versatile document can be used to inform

strategic funding directions, formulate actions addressing threats faced by waterbirds and their fragile habitats, or draw attention to some challenges that individuals and organisations involved in waterfowl conservation face. In my opinion, the 4th edition of the Waterbird Population Estimates is a must-have and must-use document for scientists and policy makers involved with wetlands and waterbirds. It is well crafted to meet the needs of almost everyone with passion for waterfowl biodiversity and their wetlands.

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Editorial

Scopus, our valued journal for regional ornithology, improved noticeably under Jeremy Lindsell's leadership over the past few years. As Editor, he brought about key changes to the journal, especially in its editorial process, striving against great odds to introduce a generally more efficient service for reviewers and authors. So it was with a good amount of hesitation that I accepted to take on the challenging and sometimes daunting task of editing Scopus from Jeremy at the end of 2006. I share the anxiety many must have felt as the journal moved from the hands of a capable and proven editor to an untried and green one... Indeed, Jeremy will be a hard act to follow, but if my appointment has gone largely unnoticed by most, then I take that as a good sign, representing a smooth transition.

Because a sizeable amount of the hard work needed for Scopus has been completed already by Jeremy and his predecessors, for me as the new editor the most important task is to ensure that the journal continues to serve as the highest quality outlet for eastern Africa ornithology, reaching out to interested ornithologists, ecologists, conservation practitioners and bird enthusiasts in the region. I hope to encourage more young authors from this region to submit their scientific research findings to Scopus. In addition, I realise that there is a great deal of exciting natural history and ethno-ornithological knowledge within the region which is being increasingly shunned by most mainstream 'scientific' journals, but which is crucial for conservation purposes. I hope Scopus continues and grows to be a worthy, reputable and reliable avenue for communication of these data and/or information.

Naturally, every new editor will (should?) have some fresh ideas in order to ensure the journal continues to evolve. My overarching aspirations form a troika that includes (i) internationalising the journal to truly reflect ongoing work in the greater eastern Africa region (not just East Africa); (ii) reaching out to more potential authors to overcome the perpetual dearth of manuscripts that continues to plague Scopus (thus reverting to the two issues per year); and (iii) further refinement of the review process to make it swift, clear and generally painless for the authors, reviewers and members of the Editorial Board. Internationalising Scopus will hopefully foster a more collaborative environment amongst all ornithologists (professional and amateurs), which will certainly help in addressing pressing conservation problems, solutions to which are just as much regional (or global) as they are local. In line with this, I strongly trust that with these changes we shall see an increase in the subscription to the journal, with the associated lift to its standing and finances. In the longer run, adequate finances will enable us to convert back issues into electronic versions for easier access by researchers and conservation practitioners in the region via the internet. Ultimately, it is my dream that the precious knowledge and information buried within Scopus can breathe once

more, and shape and inspire (as it should) bird and biodiversity conservation in our region.

It thus leaves me only to thank Jeremy for his brave and commendable management of Scopus under an occasionally very difficult and frustrating working atmosphere, and the substantial improvements he implemented as Editor. I have learnt much from him during the handing over process, and will continue to do so because he graciously accepted to retain some editorial duties as a member of the Editorial Board and coordinator of the East Africa Rarities Committee.

I would like to end by sincerely thanking two outgoing members of the Editorial Board—Graeme Backhurst and Don Turner. I need not dwell too much on them because they are both exceptionally well known to the Scopus readership for their tireless and unrivalled contribution to development of the field ornithology in our region. They will surely be greatly missed. With the same breath, I also wish to welcome oncoming members to the Board who are faced with the inspiring task of filling the gap left by the outgoing members—Muchai Muchane and Darcy Ogada. I have no doubt that they have what it takes to move Scopus to greater heights and believe that they will give their best towards this cause. I would like to single out the tremendous effort by Darcy who doubles up as the Editorial Assistant, helping out with managing the day-to-day business of Scopus on top of meticulously laying out Scopus issues.

I look forward to a satisfying and enjoyable time as Editor for Scopus. I am utterly convinced that together we can attain greater heights for eastern Africa ornithology, and we shall be sure to bring Scopus with us as we soar up there!

Many thanks

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Both English and scientific names of birds should be given when the species is first mentioned–in the title and in the text–thereafter, only one name should be used. Bird names should be those of a stated work. Any deviations from this work should be noted and the reasons given. Original black-and-white photographs and line illustrations should not be larger than A4 (210 x 297 mm). Line illustrations should be on good quality white paper or board, or on tracing material, with lettering of professional quality (if this is not possible, label an overlay, not the original figure). Copies of graphics as separate electronic documents (files) in JPEG, TIFF or EPS format are appreciated. All articles should be submitted by email or on paper (two copies) with a copy on disc as a Rich Text Format (RTF) file; submission by email is preferred. Hard copies should be printed on one side of the paper only with wide margins all around.Authors of full papers and short communications receive a PDF copy of their article *gratis*. Any paper copies, charged at cost, must be ordered when the MS is accepted.

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c/o Ornithology Section, Department of Zoology, National Museums of Kenya, P.O. Box 40658 00100, Nairobi, Kenya
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Ringing scheme of eastern Africa
This covers several countries in the area. Qualified and aspiring ringers should contact the ringing organizer, Bernard Amakobe, Ornithology Section, Zoology Dept. National Museums of Kenya P.O. Box 40658, 00100-Nairobi, Kenya.
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EANHS Nest Record Scheme
Details of most kinds of breeding activity are welcomed by the scheme and nest record cards may be obtained free of charge from the Nest Record Scheme organizer, EANHS, P.O. Box 44486 00100, Nairobi, Kenya. Tel. +254 20 3749957.
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The BirdLife International Partnership in eastern Africa
Through its national partners, the BirdLife International Africa Partnership Secretariat in Nairobi co-ordinates bird conservation work in the region and produces several other publications of interest to ornithologists.

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