

STATUS OF EASTERN GREEN TINKERBIRD *VIRIDIBUCCO SIMPLEX* IN SUL DO SAVE, SOUTHERN MOZAMBIQUE, AND NOTES ON SELECTED BIRD SPECIES OF THE SITILA-MASSINGA COASTAL, TROPICAL, SEMI-DECIDUOUS DRY FOREST AND THICKET COMPLEX, INHAMBANE PROVINCE

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Davies, G.B.P. 2013. Status of Eastern Green Tinkerbird *Viridibucco simplex* in Sul do Save, southern Mozambique, and notes on selected bird species of the Sitila-Massinga coastal, tropical, semi-deciduous dry forest and thicket complex, Inhambane Province. *Durban Natural Science Museum Novitates* 36: 30–44. The recent rediscovery of Eastern Green Tinkerbird *Viridibucco simplex* in the southern African zoogeographical region in the Sitila-Massinga district, Inhambane Province, southern Mozambique is described. The habitat of the tinkerbird in the Sitila-Massinga district is a form of coastal, tropical, semi-deciduous dry forest and thicket. This dry forest-thicket formation (here termed the ‘Sitila-Massinga thicket’) is part of the larger, archipelago-like semi-deciduous, tropical, dry, ‘sand’ forest botanical unit distributed along the East African coast. The population of Eastern Green Tinkerbirds in Inhambane Province is probably in the low thousands. Correction is made to erroneous locality co-ordinates for the original Eastern Green Tinkerbird record from Chicomo perpetuated through the recent literature. The overlooked occurrence of Eastern Green Tinkerbird on the Gorongosa Massif, Sofala Province, central Mozambique is highlighted. New distributional information of selected uncommon or noteworthy species in the Sitila-Massinga thicket and dry forest formation is provided.

KEYWORDS: dry forest, Eastern Green Tinkerbird, *Viridibucco simplex*, Mozambique, thicket.

INTRODUCTION

The Eastern Green Tinkerbird *Viridibucco simplex* (Fischer & Reichenow, 1884) is a small, dull-green tinkerbird that has been included in a broadly-defined tinkerbird genus *Pogoniulus* Lafresnaye, 1842 by most recent authorities. The present paper, however, places *simplex*, and its relative *leucomystax*, the Moustached Green Tinkerbird, in the genus *Viridibucco* Oberholser, 1905 because the plumage patterns of these two species differ markedly from other tinkerbirds and there is an indication that they have a unique, hyper-specialised diet (see Discussion at the end).

Until recently, the Eastern Green Tinkerbird has been known from the southern African region only on the basis of a single skin from Chicomo, Funhalouro District, Inhambane Province, Mozambique (Pinto 1959, 1960; Clancey 1971, 1996). During the course of this investigation, a further overlooked locality for the species, the Gorongosa Massif, also came to light, as discussed further below.

This paper documents the recent rediscovery of Eastern Green Tinkerbird in southern Africa and summarises information on selected uncommon or noteworthy species found in the coastal, dry, forest-thicket complex of the Sitila-Massinga district, Inhambane Province Mozambique, by extracting records from the specimen database of the Durban Natural Science Museum, South Africa, and personal observations during two brief field-trips to Gaza and Inhambane provinces, Sul do Save, Mozambique. The term ‘Sul do Save’ refers to Mozambique south of the Save River and comprising the provinces of Maputo, Gaza and Inhambane. This term is employed in preference to ‘southern Mozambique’, which in the ornithological literature, has come to have a vague meaning and is often applied to Mozambique south of the Zambezi River (e.g. Clancey 1996). A brief popular account of the rediscovery of the Eastern Green Tinkerbird in Sul do Save, Mozambique has been written (Davies & Chittenden 2013) but fuller discussion and amplification of certain points is required.

The original Eastern Green Tinkerbird skin from Sul do Save,

was collected for the Museu Dr Álvaro de Castro (Maputo Natural History Museum; museum registration number 6184) near the village of Chicomo on 15 January 1958 by Rui Quadros (1937–2010), whom Pinto (1959: 15) called an “*incansável coletor*” (tireless collector). Pinto (1959: 20) justifiably referred to Quadros’s tinkerbird as “*uma notável descoberta*” (a remarkable discovery) because the nearest records at that time were from eastern Malawi, approximately 750 km to the north (Benson 1953: 44).

The Quadros skin is still in existence and remains in adequate condition (photos of the skin forwarded in September 2013 by G. Allport). Clancey (1984: 180) tentatively ascribed the Quadros skin to the subspecies *hyloidytes*, otherwise only known from Malawi, which putatively differed from the nominate subspecies (of Tanzania and Kenya) by being larger in size, darker above and more dusky grey-olive below.

In discussing the tinkerbird in his Appendix 1, Parker (1999: 265) introduced an unfortunate locality error. Parker (1999: 265) gave the quarter-degree-grid (15’ X 15’) square reference for Chicomo as “2434CA”. There is indeed a town called Chicomo in that grid-cell, which lies 40 km south-west of Coguno, a collecting locality made famous by C.H.B. Grant as the type locality of Rudd’s Apalis *Apalis ruddi* and Neergaard’s Sunbird *Cinnyris neergaardi*. But this is not the Chicomo that Quadros visited, as is evident from reading Pinto’s (1959, 1960) reports. Clancey (1971, 1996) also referred to the “Funhalouro district”, which is far from Coguno. The pertinent Chicomo village is at 22° 46’ 29.55”S; 35° 01’ 07.55”E and lies approximately 65 km north-west of the town of Massinga.

In *The Atlas of Southern African Birds*, Spottiswoode (1997) worsened the error by giving Chicomo’s quarter-degree-grid square reference as 2034CA (i.e. a grid-cell north of the Save River in a mixed savanna area); this was clearly a *lapsus calami* for 2434CA. The map for the Eastern Green Tinkerbird in the seventh edition of *Roberts Birds of Southern Africa* (Hockey *et al* 2005: 141) copied the incorrect Chicomo locality from Parker (1999) as well as the false locality reference given by Spottiswoode (1997), but unfortunately did not mark the correct Chicomo. More recently, Dowsett-Lemaire (2010) repeated the erroneous Chicomo grid-reference as “2434C1”.

The *Roberts* 7 map also placed a question mark in the Inhaminga district, Sofala Province of central Mozambique. This stemmed from P.A. Clancey’s possible sighting of the tinkerbird “in forest-woodland mosaic near Inhaminga ... in June 1968” (Clancey 1971: 294, 1996: 150). When questioned by H.N. Chittenden (pers. comm.) regarding this sighting in the late 1990s, Clancey said he had only seen “something small and green in the canopy”. Michael P.S. Irwin, who was with Clancey during the June 1968 expedition, has no recollection of Clancey mentioning such a noteworthy record while in the field (Irwin *in litt.*, September 2013) and consequently, given the lack of any adequate supporting information, Clancey’s record should be viewed with circumspection.

Subsequent to Quadros’s skin, no further acceptable records of Eastern Green Tinkerbird from southern Africa came to light. Clancey (1996) summarised its status as “unknown” and Spottiswoode (1997) as “uncertain”, while Parker (1999: xxiii) called it “tantalisingly obscure”.

At the time the popular account (Davies & Chittenden 2013) was written, the present author was unaware of any other reliable records of Eastern Green Tinkerbird for southern Mozambique, aside from Quadros’s skin. However, this overlooked K.L. Tinley’s (1977: table 9.6) unpublished thesis for the Gorongosa area, Sofala Province, in which Eastern Green Tinkerbird was listed as a

frugivore dispersal agent on the Gorongosa Massif. A highly experienced naturalist, K.L. Tinley (*in litt.*, 16 May 2013) confirms that “I frequently saw [Eastern Green Tinkerbird] when I climbed the footpath through the forest once a month [1969–1972] to the highest plateau to collect and record the phenology of the summit grasslands”. This footpath approximately ran from the Murombedzi Waterfall (18° 29’ S, 34° 0 2’ E, ca 850 m asl) up to the summit on the south-west side of the massif (with complete altitudinal sequence of wet, closed-canopy forest up to ca 1800 m asl). No other records exist from Gorongosa Massif.

Following the end of the civil war, Parker (1999, 2005a) undertook an ambitious, largely single-handed atlassing project in Mozambique, mostly south of the Zambezi River. Given the vast area he had to cover and severe logistical constraints, his investigation of individual 15’ x 15’ grid-cells could often be no more than cursory. He did not encounter Eastern Green Tinkerbird during his seven years in southern Mozambique, although he later found the species in Niassa Province, northern Mozambique (Parker 2005b). Thus, by the 2000s, the status of the Eastern Green Tinkerbird south of the Zambezi River remained enigmatic and there was even some speculation that the locality information of the original skin was suspect (e.g. Sinclair *et al.* 2011: 274).

Nuttall (1998), in a popular account of the Olive-headed Weaver *Ploceus olivaceiceps* in the Panda district, Inhambane Province, mentioned Eastern Green Tinkerbird as one of the species he had seen in that area. However, Nuttall cannot recall the details of this sighting and reports that it was mentioned in error (D. Nuttall *in litt.*, June 2012). Furthermore, the habitat in the Panda area is predominantly tall *Brachystegia* woodland and subsistence agricultural plots and it is unlikely the tinkerbird would occur there.

METHOD

Unpublished records were extracted from the Durban Natural Science Museum avian database of skins collected in the dry forest-thicket belt between Massinga and the Save River, Inhambane Province. For reasons explained below, these expedition camps fell within what I term the ‘Sitila-Massinga dry forest-thicket complex’. The museum personnel collected in that area during April–June 1966 and June–July 1971. Details of the activities of the museum personnel during those expeditions are poorly documented, although some details appear in Clancey & Lawson (1967) and Clancey (1996); note that in the latter publication Clancey evidently had forgotten about the 1971 expedition as he does not mention it. Examination of the collection dates of skins held in the museum allows for more complete itineraries to be assembled (see Table 1). In total, approximately 37 days were spent by five collectors from the Durban Museum in or near the Sitila-Massinga thicket complex.

During 16–19 June 2011 D.W. Pietersen and I undertook a brief reconnaissance of the Sitila-Chicomo area, north-west of Massinga. We did not camp in the thicket formation but drove in each day from Morrungolo on the coast, and investigated the thickets approximately 10–15 km north of Sitila and along the entrance road to Chicomo village. Our approach was to stop at promising-looking areas of dense thicket and low-stature forest, listen and walk the immediate area. We did not employ playback of the tinkerbird calls during these investigations.

Between 15–17 January 2013 H.N. Chittenden and I camped 10.6 km north of Sitila along an overgrown bush track at 23° 04’ 14.35”S; 35° 03’ 41.18E (ca 115 m asl). We walked slowly along

TABLE 1.

Summary of routes and dates of collecting camps during the two Durban Museum expeditions (April-June 1966 and June-July 1971) that included the Sitila-Massinga thicket complex. Personnel during the 1966 expedition comprised P.A. Clancey, W.J. Lawson and M.O.E. Baddeley, and P.A. Clancey, F.L. Farquharson and R.C. Goetz during the 1971 expedition.

LOCALITIES	DATES	LOCATION	COMMENTS
1966 EXPEDITION			
Chimonzo	23 April-4 May 1966	30 km NW of Xai-Xai	In or near the Macia Forest
Panda	6-17 May 1966	65 km SW of Maxixe	<i>Brachystegia</i> woodland
Massinga	18 May-25 May 1966	55 km N of Inhambane	In or near the Sitila-Massinga thicket complex
Mapinhane	26 May-6 June 1966	36 km SW of Vilanculos	In or near the Sitila-Massinga thicket complex
1971 EXPEDITION			
Chicumbane	2-4 June 1971	15 km NW of Xai-Xai	Floodplain grasslands and agricultural fields
Massinga	7-13 June 1971	55 km N of Inhambane	In or near the Sitila-Massinga thicket complex
Vilanculos	15-20 June 1971	-	Subsistence agriculture and savanna
Rumbacaca	21-27 June 1971	45 km NW of Vilanculos	Dry thicket
10 km S of Save River	28 June-4 July 1971	-	Dry thicket

existing paths and tracks in the thicket complex noting all birds heard and seen, and periodically employing brief playback of the ‘pop-trill’ of Eastern Green Tinkerbird, from Gibbon (1991), a recording made by F. Dowsett-Lemaire on Mangochi Mountain, eastern Malawi; see also Short & Horne (2001: 152). We also drove along the tracks in the area, stopping at remnant patches of thicket and forest, and again periodically using playback of the tinkerbird calls. On 17 January, four 10-12 m mist-nets were deployed for ca 4 hours along our camp bush track.

A gazetteer with the co-ordinates of all the localities mentioned in the text appears in Appendix 2.

RESULTS

Rediscovery of the Eastern Green Tinkerbird at Chicomo-Sitila

We did not find Eastern Green Tinkerbird during the June 2011 reconnaissance and only saw a single Yellow-rumped *Tinkerbird Pogoniulus (Micropogonius) bilineatus* during that trip no tinkerbirds of any species were heard vocalising.

In January 2013, Yellow-rumped Tinkerbird was common near our campsite with ca three-four individuals singing daily. On 16 January we investigated a narrow track starting just east of the indistinct settlement of Bobiane. Approximately 3.7 km ENE of our camp we located the first Eastern Green Tinkerbird in a small but lush forest patch. The tinkerbird was detected by using playback of the fast ‘pop-trill’. The response by the Eastern Green Tinkerbird was almost immediate, it began singing vigorously from the upper canopy in response to the recorded call. Identification was straight-forward: a tiny, grey-green tinkerbird with yellow edging to the remiges, bright yellow rump and a dark bill with a paler pinkish-yellow base. (Fig. 1.)

We recorded Eastern Green Tinkerbird at a further six localities along the approximately 9 km of track running from



FIG. 1. Eastern Green Tinkerbird near Bobiane (Hugh Chittenden).

Bobiane to just west of Unguana (on the EN1 highway) on 16 and 17 January (summarised in Table 2). Most of these tinkerbirds were found by using playback, although some were heard calling spontaneously. As with the first tinkerbird, response to the playback was invariably swift, the tinkerbirds approaching rapidly and appearing above our heads in the lower canopy. After call-up, several individuals puffed their plumage out and the singing sometimes changed to an agitated chittering. All tinkerbirds seen were restricted to remnant patches of the thicket and dry forest, and none were seen in the subsistence farm plots adjacent to the thicket and dry forest patches.

Throughout this 9 km of track, Yellow-rumped Tinkerbird co-occurred and sometimes responded to the playback of the Eastern Green Tinkerbird song. On one occasion we saw a Yellow-

TABLE 2.

Details of Eastern Green Tinkerbirds recorded between Bobiane and Unguana in the Sitila-Massinga thicket in January 2013:

CO-ORDINATES	REMARKS
23° 03' 42.2" S; 35° 06' 16.0" E	Single bird responded to playback, thick forested grove
23° 03' 37.3" S; 35° 10' 45.7" E	Pair responded to playback, rather open grove of <i>Azelia</i> , <i>Sclerocarya</i> and <i>Strychnos</i> trees
23° 03' 39.5" S; 35° 10' 53.0" E	Pair responded to playback, another bird unconnected with the pair heard singing (pop-trill) in the distance
23° 03' 45.1" S; 35° 10' 20.0" E	Individual heard singing in large thicket on termite mound, playback was attempted and a pair of tinkerbirds approached closely
23° 03' 55.0" S; 35° 08' 50.4" E	Single tinkerbird answered playback and came to road edge to investigate
23° 03' 47.5" S; 35° 07' 20.8" E	Individual singing spontaneously, answered playback
23° 03' 39.5" S; 35° 05' 43.1" E	Individual singing spontaneously, answered playback

rumped Tinkerbird chase an Eastern Green Tinkerbird after both were attracted to the call-up.

Description of Sitila-Massinga thicket and dry forest complex

The natural vegetation in the Sitila-Chicomo area, and the habitat of the Eastern Green Tinkerbird, was found to be a form of dense, coastal, semi-deciduous thicket with dry forest emergents growing on soft red sands (Fig. 2). The understorey was extremely dense, approximately 5-6 m high and largely impenetrable without a machete (Fig. 2). It was dominated by the following shrubs, creepers and small trees *Hymenocardia ulmoides* (Euphorbiaceae), *Rhoicissus* cf. *digitata* (Vitaceae), *Alchornea laxiflora* (Euphorbiaceae), *Uvaria* cf. *lucida* (Annonaceae), *Ancylobotrys* sp. (Apocynaceae), *Monanthotaxis caffra* (Annonaceae), *Ximenia* sp. (Olaceae), *Monodora* sp. (Annonaceae), *Hypericanthus* sp. (Rubiaceae), *Teclea* sp. (Rutaceae), *Grewia caffra* (Tiliaceae), *G. microthyrsa* (Tiliaceae), and *Vitex* cf. *ferruginea* (Lamiaceae).

Above these lower strata were taller (10-20 m) dry forest trees, prominent canopy species including *Azelia quanzensis* (Caesalpiniaceae), *Cleistanthus schlechteri* (Euphorbiaceae), *Drypetes arguta* (Euphorbiaceae), *Drypetes natalensis* (Euphorbiaceae), *Erythrophleum lasianthum* (Caesalpiniaceae), *Manilkara discolor* (Sapotaceae), *Pteleopsis myrtifolia* (Combretaceae), *Suregada zanzibariensis* (Euphorbiaceae), *Strychnos* sp. (Strychnaceae), *Balanites maughamii* (Balanitaceae), *Combretum* sp. (Combretaceae), *Margaritaria* sp. (Euphorbiaceae), and *Ochna natalita* (Ochnaceae). The canopy layer was discontinuous and these tall trees seemed aggregated into clumps (this patchiness of the emergent canopy trees is also visible on satellite imagery of the area, giving an unevenness to the green tone of the vegetation formation).

During our January 2013 trip it was striking that a large number of creepers, shrubs and trees were in heavy fruit including: *Flueggea* sp. (Phyllanthaceae), *Ximenia* sp. (Olaceae), *Teclea* sp. (Rutaceae), *Psyrax* cf. *locuples* (Rubiaceae), *Drypetes natalensis* (Euphorbiaceae), and the epiphytic cactus, *Rhipsalis baccifera* (Cactaceae).

There were also a number of baobab trees (*Adansonia digitata*; Malvaceae) and tree aloes (*Aloe barberae*; Xanthorrhoeaceae)



FIG. 2. View of the Sitila-Massinga thicket. Note the dense understorey, sandy soils and fairly low, discontinuous canopy. Photo taken June 2011, approximately 10 km north of Sitila village, Sul do Save, Mozambique.

present, although these seemed mostly restricted to the edges of the thicket formation. At least two of the baobabs were being strangled by enormous figs (possibly *Ficus natalensis*; Moraceae). We did not observe any miombo elements (such as the caesalpinoids *Brachystegia spiciformis* or *Julbernardia globiflora*) within the Sitila thicket formation, but adjoining the thicket were remnant patches of *Julbernardia*, suggesting that the dry forest-thicket had originally occurred within a miombo matrix before agricultural slash-and-burn.

A considerable amount of destruction had occurred via subsistence agriculture plots (principally growing maize and cassava) and the original thicket vegetation had largely been reduced to fragments (varying greatly in size from <1ha to ca 2000 ha, but mostly under 50 ha) in the agricultural matrix. Two recently felled, mature *Azelia quanzensis* trees, one old, massive felled *Azelia* and a large wood-pile of ca 70 poles (each about 1.5m long) were noted in June 2011. Signs of local hunting were fairly common including, a freshly-killed blue duiker *Philantomba*

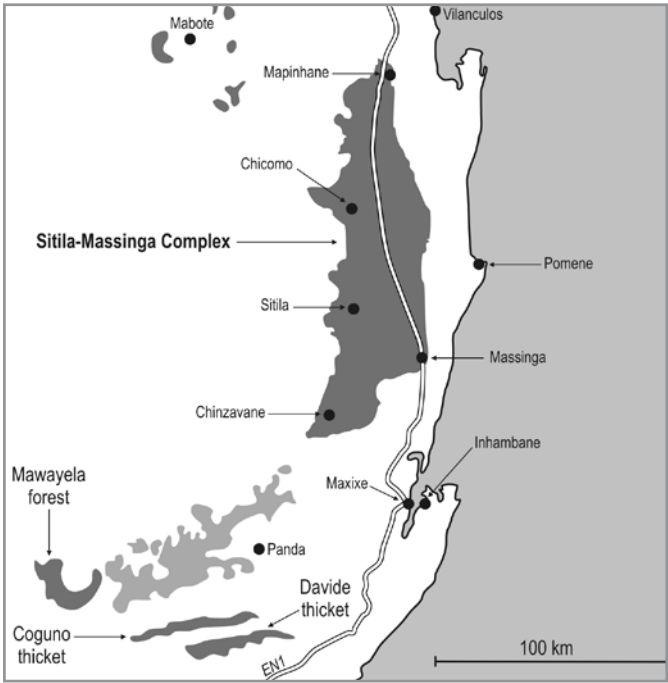


FIG. 3. Deployment of the Sitila-Massinga dry forest-thicket complex and other dry forest formations (including the mesic, tall Panda miombo woodland formation) in Sul do Save, Mozambique. Note that dune forests and dry forests/thicket complexes of the interior (>100 km inland) are not depicted on the map. The shading of the Sitila-Massinga complex does not imply that currently or historically there was forest/thicket throughout the shaded area, but rather that these appear to represent the boundaries of this botanical unit. Note also the disjunct, archipelago-like distribution of dry forest and thicket in Sul do Save.

monticola carcass on the back of a truck and several snares in the understorey of the thickets in June 2011. An old shotgun cartridge and two wire snares were found close to our campsite in January 2013. Heavy invasion along the edges of part of the thicket formation by the alien succulent *Opuntia cf. ficus-indica* (Cactaceae) was also observed.

The satellite photography shows that the Sitila-Massinga dry forest-thicket complex forms a fairly distinct botanical unit at the landscape level (Figs 3 and 4), although it has been severely fragmented by subsistence cultivation. The dry forest-thicket complex lies approximately 30-40 km inland of the Indian Ocean, between ca 80-150 m asl with an extremely flat topography. No reliable rainfall figures are apparently available from within the Sitila-Massinga dry forest-thicket belt but the area probably gets around 800-1000 mm of rainfall/annum (see Tinley 1977: fig. 4.8), on the lower threshold for forest development. It runs from approximately 22° 09' S to 23° 38' S and 35° 21' E to 34°5 7' E. The area demarcated for the Sitila-Massinga dry forest-thicket complex in Figs 3 and 4 covers an area of approximately 500 000 ha, but less than 200 000 ha of the area shaded is covered in dry forest and thicket. The demarcation is tentative as there was little ground-truthing and even prior to the destruction of the thicket by subsistence agriculture, the dry forest and thicket would not have been uniformly distributed but interspersed amidst miombo woodland, drainage lines and open grassy areas. The area

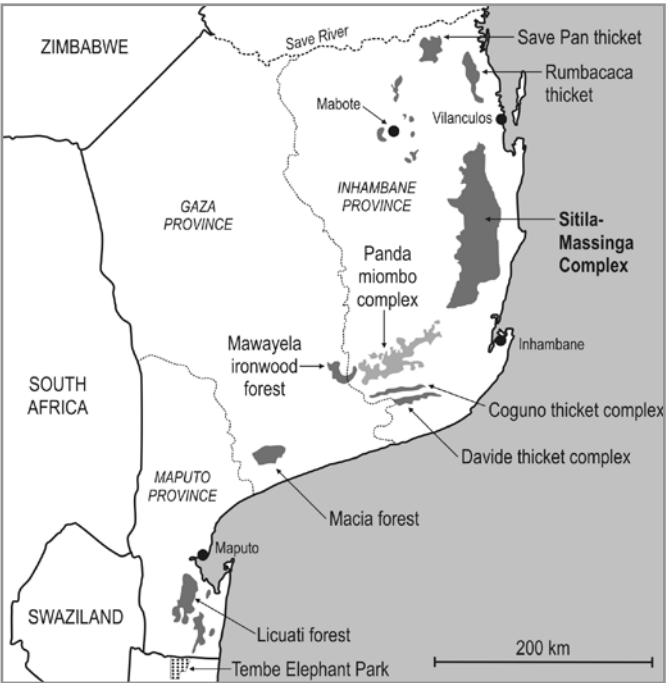


FIG. 4. Map of the Sitila-Massinga dry forest-thicket complex and villages/towns of relevance. The shading of the Sitila-Massinga complex does not imply that currently or historically there was forest/thicket throughout the shaded area, but rather that these appear to represent the boundaries of this botanical unit. EN1 = main (EN1) highway.

indicated in Figs 3 and 4 should be taken as a first approximation, awaiting extensive ground-truthing and more refined analyses.

The deployment of the Sitila-Massinga dry forest-thicket complex appears to be restricted to the distribution of a luvic arenosol soil unit (= soft red sands with a differentiated subsurface layer) mapped in the Mozambique Soils Map (F.A.O. 1982). This sand unit runs from just south of the R423 road in a longitudinal (north-south) band through the Chicomo-Sitila district past Massinga and down to around Chinzavane.

North of the R423 road the soils change to an orthic luvisol and the dry forest-thicket complex stops and is replaced by more open, drier savanna, although there are scattered, tiny (< 20 ha) patches of dry thicket and two large blocks of dry thicket. The first of these two larger blocks is the Save Pan thicket, located a few kilometres south of the main bridge over the Save River. This has become a popular bird-watching locality (Cohen *et al.* 2005: 297) and appears also to have been one of the collecting camps during the 1971 Durban Museum expedition ("10 km of Vila Franca do Save"). The second block is what I have termed the 'Rumbacaca thicket', a very dry thicket complex between the Save Pan thicket and Vilanculos (Fig. 4). East of the Sitila thicket, the luvic arenosol is replaced mainly by a coarser-grained, paler ferralic arenosol (F.A.O. 1982) that does not support thicket or forest, but rather low-statured miombo savanna and open *Sclerocarya-Terminalia* woodland, although now almost entirely converted to agricultural plots and homesteads.

The biogeographical and ornithological relevance of this pedological data is that, under the existing rainfall regime and despite the heavy destruction of the vegetation by subsistence farmers, the dry forest-thicket formation preferred by Eastern

Green Tinkerbird is probably naturally restricted to the belt of luvic arenosols. My supposition is therefore that the Sitila-Massinga thicket-dry forest is an edaphically-based refugium for forest species such as Eastern Green Tinkerbird under a climate regime generally inimical to forest formation.

Study of the satellite imagery also reveals how limited forest and thicket vegetation is in Sul do Save, over and beyond destruction by human activities. The major coastal forests and thicket complexes, aside from dune forest, in Sul do Save, conspicuous at a landscape scale, are plotted in Fig. 4.

Other bird species at Sitila-Massinga

Eighty-eight bird species were recorded in the Sitila thickets (including the subsistence agricultural plots) during our two trips (Appendix 1; which also provides scientific names). The dawn chorus at our January campsite was dominated by Red-necked Spurfowl, Purple-crested Turaco, Red-chested Cuckoo, Brown-hooded and Mangrove Kingfishers, Square-tailed Drongo, Terrestrial Brownbul, Bearded Scrub-robin, Eastern Nicator and Yellow-breasted Apalis. After the dawn chorus faded away, the most vocal species in the thicket were Yellow-rumped Tinkerbird, Sombre Greenbul, Green-backed Camaroptera, Eastern Nicator, Black-backed Puffback, Southern Boubou, Gorgeous Bush Shrike and Grey Sunbird, all of these species calling even in the extreme heat of mid-day, when most other birds were silent. Records of rare, uncommon or otherwise noteworthy species are discussed below, especially those for which Parker (1999) had few or no records from the Sitila-Massinga area.

Ayres's Hawk-Eagle

One immature soaring over the Sitila thickets on 16 June 2011 (23°05' 59.0" S; 35°05' 07.0" E). The breast had a peach wash while the rest of the underparts were white and the primaries and secondaries were heavily barred. Parker (1999: 41) recorded it from grid-cell 2335AA, which covers the Sitila-Massinga thicket but described it as a non-breeding summer migrant to Sul do Save (we also observed an adult between Homoine and Maxixe in June 2011).

European Honey-Buzzard

A trio of pale morph adults soaring together over the thickets near our campsite on 15 January (diagnostic tail and wing pattern noted). Another pale morph adult soaring over thickets at 23°03' 55.0" S; 35°08' 50.4" E on 17 January, possibly one of the birds from 15 January. Parker (1999: 37) had no records between the Limpopo and Save rivers.

Mangrove Kingfisher

In January 2013, daily song at dawn was heard from a bird near our campsite and two further birds were heard singing west of 23° 02' 29.0" S; 35° 03' 04.5" E and 23° 03' 42.7" S; 35° 03' 11.2" E on 17 January. Another individual was found singing close to an arboreal termitarium with an entrance hole in a large baobab at 22° 54' 35.6" S; 35° 05' 17.5" E (11.5 km south-west of the village of Nhachengue) on 17 January, which was probably its nest site (see Davies *et al.* 2012). Aside from Brown-hooded Kingfisher, the Mangrove Kingfisher was the commonest dryland kingfisher of the Sitila thickets. During the June 2011 trip no sign of the kingfishers was found and this species was also unrecorded by the Durban Museum parties in the winters of 1966 and 1971. Either the kingfishers were overlooked (because they were

not singing) or the kingfishers had moved away (possibly to the coast) during the winter. Parker (1999: 135) only found the kingfisher in littoral grid-cells in Sul do Save, although it has been observed ca 125 km inland along the Save River during summer (Allan *et al.* 2000: 21) and on one occasion in Gona-re-zhou, south-eastern Zimbabwe, in winter (R.G.C. Boon pers. comm.).

Livingstone's Turaco

In January 2013, this turaco was uncommon and heard in several places, e.g. south of our campsite and west of 23° 04' 05.9" S; 35° 03' 27.0" E. It was far out-numbered by Purple-crested Turaco, which co-occurred in the thickets. I have also observed overlap between the two turaco species in the upper Chinizua River drainage, Sofala Province, the southern part of Inhambitanga Forest, Sofala Province, and along the Mutsambidzi River, western Cheringoma Cuesta, Sofala Province. Further south in northern Zululand, they co-occur in Mabibi and Manguzi forests (Tinley 1976: 125). The Durban Museum collected two skins at Massinga, a female on 18 May 1966 (DM 20996) and a male on 11 June 1971 (DM 26852), but it is unlikely to occur in the immediate vicinity of Massinga anymore. Parker (1999: 110) had only five grid-cells marked for this turaco north of the Limpopo River, including an isolated square at 2335AA covering the Sitila-Massinga thicket. The population in the Sitila-Massinga thicket is evidently strongly isolated from other populations in the region, which persist mostly in dune forest.

Green Malkoha

Fairly common in the thicket during our January 2013 trip, both the full song and querulous 'weeping' call were heard throughout the Sitila thickets. The species was heard on one occasion on 19 June 2011 from a roadside thicket (22° 49' 57.06" S; 35° 10' 04.83" E) approximately 2 km north-west of Nhachengue. Henry Francis found it "not uncommon" in the Inhambane district (Sclater 1899) and the Durban Museum collected two males at Massinga on 11 June 1971 (DM 26854-26855). Parker (1999: 117) had no mainland records for this malkoha between the Incomati and Save rivers.

Tiny Greenbul

The type specimen of this greenbul was collected by Henry Francis apparently about twenty miles (32 km) north of the Bay of Inhambane, near the coast (Brooke 1993: 338). This would place it on the south-eastern edge of the Sitila-Massinga thicket complex, although Sclater (1899) merely quotes Francis to the effect that it was collected "north of Inhambane". Perhaps Brooke (1993) was quoting directly from the label of the type. Three males were collected at Massinga in July 1899 by an unknown collector but probably one of the Francis brothers (DM 6523-6525). The Durban Museum personnel collected a sub-adult male at Massinga on 24 May 1966 (DM 20146). Parker (1999: 174) had a single record in December 1995 from a small forest patch north-west of Massinga in the Sitila-Massinga thicket. Pinto & Lamm (1955: 133) did not succeed in finding it in Sul do Save. In January 2013, we found a single bird singing at dawn in a lush forest patch (at 23° 04' 19.8" S; 35° 12' 13.9" E) but otherwise we did not encounter this greenbul and it is evidently scarce in the area. The Sitila-Massinga population is isolated by approximately 400 km from the nearest birds in Sofala Province. It has also been reported recently from the mid-altitude (900 m asl) Chirinda Forest, south-eastern Zimbabwe (Caldwell-Barr 2002; Cizek 2004), approximately 360 km to the

north-west, although never found there by Charles Swynnerton during his long exploration of that forest (Swynnerton 1907a, b). As the vernacular name indicates, this is a small, arboreal, leaf-gleaning greenbul, almost warbler-like in deportment and physiognomy (personal observations in Sofala Province, central Mozambique). Noting some of its unusual structural characters, Roberts (1922: 226) erected a new genus (*Sclaterillas*) for *debilis* but it was recovered as part of the *Phyllastrephus* clade based on mitochondrial and nuclear gene evidence (Moyle & Marks 2006) and, thus *debilis* could be viewed as a phyletic dwarf within its genus; a greenbul that ‘became’ a warbler.

Black-headed Apalis

In June 2011 we encountered a pair of Black-headed Apalises foraging with a mixed species flock in the lower canopy about 10 km N of Sitila (at 23° 04’ 23.06” S; 35° 03’ 56.5” E). In January 2013, this apalis was found in the same area but was uncommon, with only two pairs encountered in the vicinity of our camp (one singing from a tall tree at 23° 04’ 46.9” S; 35° 04’ 24.2” E and pair foraging in the lower canopy at 23°04’ 25.1” S; 35°03’ 58.1” E). Three males were collected at Massinga in May 1966 by Durban Museum personnel (DM 20065-20067) and one female on 7 June 1971 (DM 27192), at the time the first records south of the Save River. The three Massinga males formed the basis of Clancey’ s (1968) description of the subspecies *addenda* (see also Chittenden *et al.* 2011: 182). The apalis was not recorded in Sul do Save by Parker (1999: 190), except on the Bazaruto Archipelago. The Sitila-Massinga population is isolated by 390 km from the nearest mainland population at Haroni-Lusitu, south-eastern Zimbabwe (Vernon *et al.* 1990). It is replaced by its close relative, Chirinda Apalis *Apalis chirindensis*; at Chirinda Forest. A record marked in the Maputo district by Hockey *et al.* (2005: 854) is without any substantive foundation as is a putative sighting from St Lucia (Cyrus & Robson 1980). The Sitila apalises did not respond to playback of a recording from Haroni-Lusitu (Gibbon 1991) and the tempo and tone of the song also sounded different to birds heard singing in Sofala Province (pers obs), suggesting the presence of a distinct local dialect and perhaps giving additional support to the validity of the subspecies *addenda*. Further investigation of this apparent vocal difference is called for.

Rudd’s Apalis

This species was fairly common in both June 2011 and January 2013 in the Sitila thickets and its rapid *pok-pok-pok* call was regularly heard. The Durban Museum only collected a single male from the Sitila-Massinga thicket formation at Mapinhane (on 4 June 1966; DM 20148), although they collected several skins further south at Panda and Chimonzo. Parker (1999: 191) recorded it commonly from grid-cells covering the Sitila-Massinga thicket formation. The distribution of this apalis is a zoogeographic enigma, especially the exiguous populations around the Shire-Zambezi confluence in central Mozambique and southern Malawi (Parker 2005a; Dowsett-Lemaire & Dowsett 2006). Its use of *Usnea* and other lichens in building its nest (Bell-Marley 1933; Roberts 1936: 206; Tarboton 2011: 266-267) may act as a natural limitation on its distribution but *Usnea* lichens are apparently scarce in the thickets occupied in southern Malawi (F. Dowsett-Lemaire *in litt.*). These lichens also appeared uncommon in the Sitila-Massinga thicket and other factors may have to be sought

to explain its localised distribution. Johnson’s (2005) identification of ‘well developed undergrowth’ as an ‘essential habitat feature’ seems too generalised to be of use.

Red-capped Robin-Chat

This robin-chat was remarkably scarce. It was only seen once and none were heard in June 2011, and only three or four were encountered in January 2013. Perhaps reflective of this rarity in the Sitila-Massinga thicket formation, the Durban Museum only collected one skin from Massinga (DM 19810) compared to 27 skins collected from the Macia Forest at Chimonzo (see also Lawson 1963). Furthermore, Parker (1999: 180) had surprisingly few grid-cells north of 24° S marked for this normally common and thicket-loving robin-chat. On the other hand, Pinto & Lamm (1955: 156) called it “a common bird” in Sul do Save.

Livingstone’s Flycatcher

This bird was fairly common in the Sitila-Massinga thicket in January 2013, usually attracting attention via its brief melodious twittering song. One mist-netted in January 2013 was in active moult, with the fifth primary growing and primaries 1-4 new, rectrix 1 new and almost fully grown, remaining rectrices old, and many body feathers in pin ventrally. The Durban Museum collected five skins from Massinga in May/June 1966 (DM 20275-20279) and a further two males from Massinga in June 1971 (DM 26660-26661), and two females from Mapinhane in May/June 1966 (DM 20273-20274). The Maputo Museum collected examples at Rumbacaca and Funhalouro (Pinto & Lamm 1955: 148; Pinto 1963: 17).

Woodwards’ Batis

This batis was fairly common in the Sitila thickets, even in small (ca 1 ha) remnant patches amidst agricultural fields. It was usually detected by its short *hoo* whistles and variations thereon. In January 2013, a female mist-netted close to our campsite was in old plumage with no active moult. Reflective of its general abundance, the Durban Museum collected no less than 15 skins in May 1966 and June 1971 at Massinga, a male at Mapinhane in May 1966, two skins from near Vila Franca do Save in June/July 1971, and two skins from Rumbacaca in June 1971. The Maputo Museum had specimens from Rumbacaca and Chicomo (Pinto & Lamm 1955: 146; Pinto 1963: 17). Parker (1999: 207) did not find it within the Sitila-Massinga complex except for the Massinga grid-cell (2235AB) and one grid-cell just west of the Sitila-Massinga complex (2234DA).

Chestnut-fronted Helmetshrike

A flock of approximately 4-5 birds were seen in the thicket at 23° 02’ 28.5” S; 35° 03’ 01.1” E in January 2013. Several other helmetshrike flocks were heard gobbling, chuckling and clicking in the distance while we travelled through the thickets but could not be attracted closer. They may have been attributable to this species but may also have been Retz’s Helmetshrike *Prionops retzii* (which was not, however, confirmed for the area). Five Chestnut-fronted Helmetshrike skins were collected at Massinga in May 1966 and June 1971 by the Durban Museum (DM 20712-20714, DM 26998) and Lamm (1953) collected it at Rumbacaca. Parker (1999: 223) recorded it at Massinga and in the vicinity of the Sitila-Massinga thicket formation but it likely occurs still further south as P.A. Clancey observed but did not collect it at Panda (Clancey & Lawson 1967) and

Lamm (1953) found it common at Coguno. It has also been seen sparingly in the dry forest-savanna mosaic in northern Zululand on the border with Mozambique (K.L. Tinley *in litt.*; Clancey 1964; Cyrus & Robson 1980; Davis 1999) and likely occurs in and around the Licuati Forest, a vast (ca 8000 ha), largely unexplored dry ‘sand’ forest in Maputo Province, ca 35 km north of the South African border (Fig. 4).

Olive Bush Shrike

This bush-shrike was heard on a few occasions (fast descending *popopopop* call reminiscent of Orange-breasted Bush Shrike *Telophorus sulfureopectus*) in the Sitila thickets during the January 2013 trip. The Durban Museum collected a female (DM 19898) in May 1966 on a densely vegetated termite mound near Mapinhane but Parker (1999: 221) did not record it north of the Limpopo River. The coastal representatives of this bush shrike in Sul do Save have been described as a distinct subspecies (*vitorum* Clancey), the males apparently lacking the black facial mask, but the taxon was not recognised by Chittenden *et al.* (2011). Further investigation of this taxon is indicated, especially to verify the facial mask characteristic of the males (which would otherwise be unique in the species).

Plain-backed Sunbird

A female was seen foraging with a mixed-species flock in a dense roadside thicket, 2.5 km NW of Nhachengue in June 2011 at 22° 49’ 35.84” S; 35° 09’ 56.00” E. During the January 2013 trip it was uncommon, e.g. a male singing at 23° 02’ 29.6” S; 35° 02’ 36.5” E. In December 2010, I also heard a male singing in a dense thicket patch near Mapinhane at the northern terminus of the Sitila-Massinga thicket. Pinto & Lamm (1960: 81-82) recorded it 50 km west of Mabote. The Durban Museum collected one juvenile female at Massinga on 8 June 1971 (DM 27202). Parker (1999: 233) had the grid-cell for Massinga shaded, as well as four grid-cells west of the Sitila-Massinga formation. This species is likely to be found in all the dry forest-thicket complexes of Sul do Save, as we also encountered the sunbird in the Mawayela Forest in June 2011 and a resident population is known, far to the south, in the dry *Newtonia-Cleistanthus* forests of Tembe Elephant Park, northern KwaZulu-Natal (e.g. Boon 2000; pers. obs).

Grey and Olive sunbirds

Grey Sunbird was very common in the Sitila thickets. Its song (a descending series of clipped, high-pitched notes) was one of the dominant bird sounds in the Sitila thicket and was frequently uttered for long stretches during the heat of the day. In contrast, we did not locate any Olive Sunbirds (represented in Sul do Save by the subspecies *olivacina* described from Inhambane). The difference in abundance is also reflected in the fact that the Durban Museum collected 18 skins of Grey Sunbird at Massinga and Mapinhane but, by contrast, just three skins of Olive Sunbird from Massinga and none from Mapinhane. Pinto & Lamm (1960: 80) also observed that Olive Sunbird was “very local in its distribution” in Sul do Save. Grant did not find Olive Sunbird in the Coguno thickets but did collect Grey Sunbird (Sclater 1911: 277). Furthermore, Parker (1999: 231) only had one grid-cell marked for Olive Sunbird north of the Limpopo River but 21 grid-cells shaded for Grey Sunbird. The difference in abundance therefore seems genuine and marked. The paucity of Olive Sunbirds may be related to the scarcity of wild bananas (*Strelitzia* species; Strelitziaceae),

which we did not observe in the Sitila-Massinga thicket. In June 2011, the only place where we encountered Olive Sunbird was on the coast at Morrungolo in a miniscule fragment (< 1 ha) of *Trichilia* dune forest containing a few clumps of *Strelitzia nicolai*. In the dune and coastal forests of KwaZulu-Natal, the arborescent *Strelitzia nicolai* is common (Boon 2010: 60) and the Olive Sunbird correspondingly so (Cyrus & Robson 1980; Harrison *et al.* 1997). Other preferred nectar sources of Olive Sunbird such as *Halleria lucida* (Scrophulariaceae) and *Leonotis leonoris* (Lamiaceae) are also absent from the Sitila-Massinga thickets. Consequently, the scarcity of Olive Sunbird in coastal Sul do Save is possibly partly a reflection of the paucity of its favoured nectar species.

Red-throated Twinspot

A single male was watched for a few minutes singing and hopping around at the edge of a dense thicket in January 2013 (face, throat and upper breast noted as an intense crimson colour) but this twinspace was otherwise not encountered. The Durban Museum collected a sub-adult male (DM 19812) and female (DM 19813) at Mapinhane in May/June 1966 while the Henry Francis found it “not uncommon” north of Inhambane (Sclater 1899; Lawson 1961). Red-throated Twinspace occurs as far south as the Macia Forest, Chimonzo (south of the Limpopo River) where the Durban Museum collected 21 skins in 1960 and 1966, finding it “abundant in the evergreen forest at Chimonzo and especially in scrub tangles around native cultivation” (Lawson 1961). No trace of Pink-throated Twinspace *Hypargos margaritatus* was found in the Sitila-Massinga thicket by us. Clancey (1996) mentioned its occurrence at Panda, Coguno and Zandamela to the south of the Sitila-Massinga thicket, but they did not collect any at Massinga, Mapinhane, Rumbacaca or near the Save River. However, Parker (1999: 248) plotted two grid-cells for *margaritatus* in the Sitila area (2235CC and 2234DB) and also from 2335CA which falls within the Sitila-Massinga thicket complex as here defined. Parker (1999) did not find Red-throated Twinspace in the Sitila-Massinga thicket or indeed north of the Limpopo River. Evidently, more field work is required to elucidate how the two twinspace interdigitate in Sul do Save. It is also possible that Twinspace (Green) Indigobird *Vidua codringtoni* may occur in Inhambane Province, given the presence of its brood host/s. Male indigobirds mimicking the song of Red-throated Twinspace have been seen in Sofala Province (personal observations) and presumably relate to *codringtoni*.

Notable bird absentees from the Sitila thickets

African Crowned Eagle *Stephanoaetus coronatus*
No sign of this large eagle was found in the Sitila thicket. It is remarkably localised in Sul do Save with the only records coming from north of Maputo and from the Save Pan thicket (Clancey 1996; Parker 1999). It is possible that it is has gone locally extinct in parts of Sul do Save through hunting of its prey base (monkeys and duikers) and perhaps direct persecution by humans.

Crested Guineafowl *Guttera pucherani*
We did not encounter this gamebird during either visit to the Sitila thickets. Given the high level of disturbance and indications of local hunting, it is possible that it has been locally extirpated or has become rare. Grant recorded that the locals hunted the guineafowl at Coguno (Sclater 1912: 48) and it may also have declined in the mid-Save River Valley due to hunting (Allan *et al.* 2000: 20). Superficially, the impenetrable thicket habitat of the Sitila-Chicomo

district looks ideal for the guineafowl. The Durban Museum collected a male (DM 19763) at Mapinhane on 30 May 1966 showing that it historically occurred in this habitat type. In contrast, Red-necked Spurfowl is common in the area and is evidently less susceptible to hunting and snaring than the guineafowl.

Green-backed Woodpecker *Campethera cailliauti*

We did not record this diminutive woodpecker during our June and January visits but suspect we overlooked this species, possibly mis-attributing some vocal records to Golden-tailed Woodpecker. The Durban Museum collected four skins at Massinga in May 1966 (DM 20776-20779) and single skins at Mapinhane in May 1966 (DM20781) and Rumbacaca in June 1971 (DM 26942). It has also been found rarely on the San Sebastian Peninsula, south-east of Vilanculos and possibly breeding in arboreal termitaria there (C. Read pers. comm.). Parker (1999: 154) had a single record for Sul do Save from Pomene, approximately 40 km east of the Sitila-Massinga thicket complex on the littoral.

Black-and-White (Vanga) Flycatcher *Bias musicus*

The last record for Sul do Save was by the Durban Museum, which collected a female at Massinga in May 1966 (DM 20325). We did not find this flycatcher in the Sitila-Chicomo area during our June 2011 and January 2013 visits but suspect we overlooked the species, which can be elusive when not calling and sitting quietly in the tree canopy. There were many spots in the thicket complex where tall (ca 20 m) forest trees adjoined agricultural fields and short scrub. From experience in Sofala Province, this is the preferred habitat of the flycatcher, i.e. the interface between forest and adjoining scrub/fields/savanna, particularly where tall *Sterculia appendiculata* trees occur at the edge of the forest or thicket patch. This is similarly the preferred habitat in southern Malawi (Dowsett-Lemaire & Dowsett 2006: 406).

Blue-mantled Crested-Flycatcher *Trochocercus cyanomelas*

This bird is astonishingly scarce in Sul do Save. Parker (1999: 208) only recorded it south of Maputo, while there are earlier records from Macia Forest, Chimonzo (south of the Limpopo River; Clancey 1996) and Inharrime, south of Inhambane (Pinto & Lamm 1955: 148; Lawson 1963). The flycatcher is common in the tall, dry ‘sand’ and dune forests of northern Zululand, e.g. at Tembe Elephant Park (pers. obs) and it is surprising that it does not extend into the Sitila-Massinga thicket complex.

Neergaard’s Sunbird *Cinnyris neergaardi*

We did not encounter this range-restricted species in the Sitila-Chicomo thicket complex and it seems unlikely that it normally occurs in this vegetation formation. From personal experience, it seems restricted to tall *Brachystegia* woodland or dry, semi-deciduous forest with heavy *Usnea* ‘old man’s beard’ lichen encrustations, e.g. it is fairly common in the tall, dry ‘sand’ forests of northern Zululand such as Tembe Elephant Park (pers. obs). The *Usnea* is particularly important to this sunbird as it employs the lichen for nesting purposes (Chittenden 2002; Tarboton 2011: 312-313). Pinto & Lamm (1960: 75) were the first ornithologists to point out its need for *Usnea* lichen and inferred that its localised distribution “was probably due to the highly specialised breeding requirements”. Although *Usnea* occurs in the Sitila-Chicomo thicket, it is probably too sparse and the canopy too low and discontinuous for this restless sunbird. It must be conceded, however, that Claude Grant possibly shot the type specimen in

the Coguno thicket formation and not the adjacent *Brachystegia* woodland (Sclater 1911: 274-275) and Clancey & Lawson (1967) collected two females at Mapinhane at the northern fringe of the Sitila-Massinga thicket complex but did not specify if they shot them in the thicket or adjoining miombo. The sunbird does not occur north of the Save River and it is striking that *Usnea* lichen is very rare in the miombo woodland and low-altitude forests of Sofala Province, central Mozambique (pers. obs). Parker (1999: 229) stated that the sunbird “is absent from pure *Brachystegia* woodland”, but it is fairly common in the miombo woodland west of Panda, Inhambane Province, an area dominated by tall *Brachystegia spiciformis* trees (Clancey & Lawson 1967; pers. obs).

DISCUSSION

Relevant to its status in southern Africa, the Eastern Green Tinkerbird has now been revealed as a locally common resident in low-altitude dry forest-thicket of the Sitila-Chicomo district, Inhambane Province, Mozambique. The population size of Eastern Green Tinkerbirds in this area is difficult to estimate, but given that that we encountered ca 6 pairs in 9 km of track traversed suggests that there may be a substantial population, possibly in the low 1000s.

The Eastern Green Tinkerbird is also likely to be an uncommon resident in moist, evergreen, low- to high-altitude (1000-1800 m asl) forest on the Gorongosa Massif as mentioned above (Tinley 1977: table 9.6), although its current status there requires investigation. Tinley’s records of the species from the Gorongosa are, at first glance, somewhat unusual because all other observers who have visited the Gorongosa Massif have not found the tinkerbird. However, this is probably not significant because most visits to the Gorongosa Massif are brief and typically involve parties of bird-watchers walking up from the base for half-a-day’s bird-watching on the lower edges of the mid-altitude forest and then returning.

Furthermore, the situation on Mount Namuli in northern Mozambique shows Eastern Green Tinkerbird can long be overlooked at a locality. Both Colonel J. Vincent (during his lengthy July-August 1932 visit) and a party of ornithologists from the Percy Fitzpatrick Institute (during their November-December 1998 expedition) failed to find the tinkerbird on Namuli, but when F. Dowsett-Lemaire visited the mountain in November 2007 she detected Eastern Green Tinkerbird, albeit at low densities (Dowsett-Lemaire 2010). Like Mount Namuli, the tinkerbirds on the Gorongosa Massif possibly occur at low densities and would thus be readily overlooked during superficial visits. Furthermore, South African observers have perhaps also mistaken the fast pop-trill of Eastern Green Tinkerbird for the calls of Yellow-rumped Tinkerbird, which is common on the Massif and has a deceptively similar pop-trill (e.g. Short & Horne 2001: 152). Despite the review paper by Oatley & Tinley (1989), the avifauna of the Gorongosa Massif is indubitably still incompletely documented, and other ornithological surprises perhaps await, especially in the barely explored higher elevation forests (above 1600 m asl).

Aside from Dowsett-Lemaire’s (2010) records from Mount Namuli, there was also a green *Viridibucco* tinkerbird species recorded by J. Makawa on Mount Chiperrone (Benson 1950). It was not ascertained whether this was *leucomystax* or *simplex*, although the latter seems more likely and it has also been recorded from inselberg forest in Niassa Game Reserve (Parker 2005b). There are no other records for northern Mozambique and it was not encountered by Roberts (1911) or Vincent (1935)

during their northern Mozambican travels (see also Dean & Milton 2007: 5). The species is “relatively widespread and common” in the coastal forests of extreme south-eastern Tanzania (Jensen *et al.* 2005: 8) and it is therefore likely to occur in the coastal dry forests of northern Mozambique (see Timberlake *et al.* 2011 for an overview of these northern Mozambique coastal forests). Prime potential localities include: 1 - Netia Forest (ca 15° 05’ S; 40° 29’ E), Nampula Province, a lowland dry forest-thicket complex, last visited by J. Vincent in May/June 1932; 2 - the Pemba North forests (ca 12° 33’ 11.27” S; 40° 23’ 00.46” E), Cabo Delgado Province, an ornithologically unexplored complex of lowland forests (ca 5000 ha); 3 - the Mepiaéca-Matoto dry forest complex (ca 17° 35’ S; 36° 27’ E), Zambezia Province, a very large (ca 30-40, 000 ha), ornithologically unexplored lowland forest system on old aggraded river-course deposits 35 km north-west of Quelimane (although Austin Roberts presumably traversed part of this forest system); and 4 - the relict escarpment forests a few kilometres south of Mueda, Cabo Delgado Province (11° 41’ 30.80” S; 39° 34’ 35.20” E; ca 750 m asl), that although tiny (perhaps 60-70 ha), likely have a considerably wetter microclimate than the dry coastal forests to the east and possibly represent a significant zoogeographic link between the important escarpment forests of the Rondo Plateau, south-eastern Tanzania (Jensen *et al.* 2005) and the forests of the Mabui, Namuli and Chiperrone massifs (Dowsett-Lemaire 2010).

Why the Eastern Green Tinkerbird should be such a highly localised species, in contrast to the ubiquitous Yellow-rumped Tinkerbird, is not understood. The Moustached Green Tinkerbird *Viridibucco leucomystax*, however, “stands out as a highly selective fruit consumer, specialising on Loranthaceae and Viscaeae [mistletoe] berries” (Dowsett-Lemaire 1988: 271) and “its breeding distribution ... correlated to the presence of at least 4-6 mistletoe species, i.e. providing berries (almost) year round” (Dowsett-Lemaire & Dowsett 2006: 293). Thus *leucomystax* could be termed a mistletoe hyper-specialist. Although Yellow-rumped Tinkerbird consumes mistletoe fruit, it also devours a wide variety of other fruit (e.g. Dowsett-Lemaire 1988). Both Eastern Green and Moustached Green tinkerbirds are closely related, indeed in the early part of the 20th century they were even treated as conspecific (e.g. Sclater 1924: 279-280), and the Eastern Green Tinkerbird may also be a mistletoe hyper-specialist restricted to forests and thickets with a sufficiently high density and richness of mistletoes (Dowsett-Lemaire 1988, 1989). During our brief time in the Sitila thickets we did not have to time to search systematically for mistletoes clumps but the mistletoes *Erianthemum dregei* and *Agelanthus subulatus* were observed fairly commonly in flower.

It is interesting to conjecture as to where else Eastern Green Tinkerbird might occur in Mozambique south of the Zambezi River, aside from the Sitila-Chicomo area and the Gorongosa Massif. Perhaps the best candidates are the enormous Maronga, Moribane and Zomba forests, in Manica Province. These forests are deployed in an arc around the eastern foothills of the Chimanimani Mountains, north and west of the town of Dombe (see Dutton 1974 and Tinley *et al.* 1976). Existing reports suggest these are wet, tall, botanically diverse forests with a broad altitudinal sequence running from ca 250-1500 m asl (e.g. Müller *et al.* 2005) but mostly under 1000 m asl. Currently, we know virtually nothing about the avifauna of these forests and Parker’s (2005a) atlas regrettably says little, although the birds are likely to be similar to those in the Haroni-Lusitu forests, Zimbabwe, immediately to the west (see Vernon *et al.* 1990). The tinkerbird also possibly occurs in the Inhamitanga Forest, Sofala Province, about 30 km south of

the Zambezi River, which is a very large, semi-deciduous forest that has barely been explored.

It is likely that most of the dry ‘sand’ forests to the south of the Sitila-Massinga complex, such as Mawayela (Marao) ironwood forest in Gaza Province and Licuati Forest in Maputo Province (see Fig. 4), are too dry, inhospitable and lacking in sufficient parasitic epiphytes to support Eastern Green Tinkerbird. The only possibilities are the Davide and Coguno thicket belts and perhaps the Macia Forest, Chimonzo (Figs 3 and 4). Examination of satellite imagery suggests that parts of Davide thicket possibly comprise tall-statured, verdant forest. The Coguno thicket, worked by Claude Grant (Sclater 1911, 1912), lies to the north-west of the Davide thicket belt and judging from the satellite imagery seems to be a drier, shorter thicket, accordant with its more inland position and thus presumably lower annual rainfall. It is not certain how comprehensive Grant’s exploration was of this thicket formation for birds. Much of his time there seems to have been devoted to trapping and shooting small mammals (Thomas & Wroughton 1907). The Macia Forest is apparently unique in Sul do Save in being a lowland forest with a distinctly wet microclimate. The Durban Museum camped in or near the forest in August/September 1960 for ca 8 days (Lawson 1963) and again in April/May 1996 for about a week (Clancey & Lawson 1967; Table 1). The discovery of Livingstone’s Flycatcher and Red-throated Twinspot, here south of the Limpopo River, reflects its zoogeographic interest. Further, the collection of three skins of Yellow-breasted Hyliota *Hyliota flavigaster* in or close to the Macia Forest by A.A. da Rosa Pinto (see Lawson 1963: 99) also hints at a locality of unusual interest. In January 2013, H. Chittenden and I visited the fringes of Macia Forest for a few hours under adverse conditions (heavy, continuous rain and wind), but located African Cuckoo Hawk *Aviceda cuculoides*, Livingstone’s Turaco, Green Malkoha, African Broadbill and Brown Scrub-Robin *Erythropygia signata*, all indicative of a rich forest avifauna. The forest was under immense human pressure, completely encircled by small agricultural plots and most of its fringes were converted to thicket, but remnant slivers of primary forest were tall (25 m +) and formed a high interlocking canopy. It is not impossible that Eastern Green Tinkerbird could occur in the Macia Forest. Further ornithological investigation of this unique forest and the remnant woodlands adjacent are urgently needed before it is entirely decimated, especially to resolve Pinto’s unprecedented records of Yellow-breasted Hyliota.

The Sitila-Massinga forest-thicket formation forms part of the tropical, semi-deciduous, dry forest vegetation unit on coastal and inland sands that extends from False Bay, St Lucia, South Africa northwards (e.g. Mucina & Rutherford 2006) through Mozambique (e.g. Tinley 1977: 127-129; Timberlake *et al.* 2011) into southern Malawi (e.g. Lengwe and Nta Thumba thicket, Dowsett-Lemaire 2004), the middle and lower Zambezi valley (e.g. Aspinwall 1975; Hoare *et al.* 2002; Coates Palgrave *et al.* 2007) and coastal Tanzania and Kenya. The other forest and thicket complexes depicted in Fig. 4 also belong to the same larger East African dry forest unit on coastal sands, although the Macia Forest may be an anomaly and more akin to those rare examples of forest with a moister microclimate found on flat coastal sands, such as Dukuduku Forest, Zululand, South Africa, and Dondo Forest, Sofala Province, Mozambique (as opposed to the more typical location of wetter forests on loamy soils on dissected escarpments and inselbergs or at the land/sea junction on dune sands).

Tropical, semi-deciduous, dry forest has proved difficult to define on floristic grounds because the vegetation shows high turn-over

in species composition and canopy dominants between forest patches (Tinley 1977: 127-128; Timberlake *et al.* 2011: 128). As Tinley (1977: 127) explained: “at the arid end of the dry forest ecocline, ... where this formation meets thickets on base-saturated duplex sands; it overlaps with thicket species, [and] at the moist end ... on leached duplex sands or fine compact sands it overlaps with rain forest tree species”. Nonetheless, indicator trees of these dry ‘sand’ forests and thickets include *Pteleopsis myrtifolia*, *Drypetes arguta*, *Cleistanthus schlechteri* and *Hymenocardia ulmoides* (Tinley 1977: 127-129; Mucina & Rutherford 2006; Boon 2010: 12). All of these species were found commonly in the Sitila thickets.

Three factors appear important in determining the extent of forest and thicket in Sul do Save. First is the climate, which is noticeably arid compared to KwaZulu-Natal to the south and the Manica and Sofala provinces to the north. It is dominated by the presence of the Indian Ocean High Pressure Cell, which prevents movement of moist maritime air over much of Sul do Save. There is also an accentuated decline in annual rainfall moving away from the littoral (from ca 1000-1200 mm/annum) to as low as 400 mm/annum in the western parts of Gaza Province (Tinley 1977: fig. 4.8). Because of this steep rainfall gradient, opportunities for forest development are largely restricted to the narrow coastal band. There are also indications that the climate has fluctuated markedly over the Holocene and particularly dry periods during the ‘Little Ice Age’ between AD 1400-1800 have been implicated, based on palynological data, in severe reductions in forest cover near Vilanculos (Ekblom 2008).

Second, is the dominance of sands (arenosols) of various types in most of eastern Sul do Save (rocks and stones being a rare sight in Gaza and Inhambane provinces). Because of their relatively large grain size, the water-holding capacities of arenosols are usually very poor and they easily become dehydrated. The dominance of areonsols on the Sul do Save plain thus further acts against the formation of forest. However, one significant pedological feature that works in the favour of forest and thicket development is the nature of differentiated sub-surface layers (horizons) in these arenosols. Tinley (1966: 75) observed that “[t]he sands on the southern part of the Mozambique Plain ... are underlain at various depths [1-3.5 m] by ... pan horizons [differentiated layers, usually of clayey consistency] and it is suspected ... that these horizons may be the key factor which supports woody vegetation in the dry season, even permitting forest to occur in a low moisture regime” (Tinley 1966, 1977, 1982). Such water-retentive sub-surface horizons may be especially important in the luvic arenosols of Sul do Save.

The third factor determining the extent of forest and thicket is anthropogenic activity. The devastation of coastal forests and woodlands in Sul do Save has long been remarked upon (e.g. Lamm 1953; Lawson 1963; Parker 1999) and the annihilation of such habitats, which presumably only became severe within the last 100-150 years, has certainly proceeded to a point of no return in the coastal corridor between Xai-Xai and Vilanculos. Just how much of the original dry forest and thicket in Sul do Save has been destroyed or converted by subsistence agriculture cannot be calculated with any confidence at this point, but the figure must be very large (possibly 500 000 ha). One complication is that the subsistence farmers probably practised shifting swidden agriculture in the past and abandoned farmlands may well have reverted to secondary thicket and forest when the densities of subsistence farmers were (presumably) much lower and areas had a chance to revegetate.

Formally protecting any of the Sitila-Massinga dry forest and thicket would be challenging because the density of subsistence

farmers is extremely high and there are few unbroken swathes of thicket that could be meaningfully demarcated as a conservation area. The whole area is essentially an intricate mosaic of farm plots and thicket/forest patches. The absence of any bird endemics (at the species level), species of high global conservation concern, or large mammals of ecotourism relevance also unfortunately militates against the chances that any part of the Sitila-Massinga dry forest-thicket could be demarcated as an efficiently protected conservation area.

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APPENDIX 1.

Check list of species recorded in the Sitila-Chicomo thicket complex during the June 2011 and January 2013 visits by G. Davies, H. Chittenden and D. Pietersen. X = recorded, O = not recorded.

SPECIES	JUNE 2011	JANUARY 2013
Ayres’s Hawk-Eagle <i>Hieraaetus ayresii</i>	X	O
European Honey-Buzzard <i>Pernis apivorus</i>	O	X
Bateleur <i>Terathopius ecaudatus</i>	X	O
Black-breasted Snake Eagle <i>Circaetus pectoralis</i>	X	O
African Harrier-Hawk <i>Polyboroides typus</i>	X	O
Red-necked Spurfowl <i>Pternistis afer</i>	X	X
Crested Francolin <i>Dendroperdix sephaena</i>	X	O
African Green Pigeon <i>Treron calvus</i>	O	X
Emerald-spotted Dove <i>Turtur chalcospilos</i>	X	X

SPECIES	JUNE 2011	JANUARY 2013
Tambourine Dove <i>Turtur tympanistria</i>	O	X
Red-eyed Dove <i>Streptopelia semitorquata</i>	X	X
Purple-crested Turaco <i>Gallirex porphyreolophus</i>	X	X
Livingstone’s Turaco <i>Tauraco livingstonii</i>	O	X
Narina Trogon <i>Apaloderma narina</i>	O	X
Barn Owl <i>Tyto alba</i>	X	O
Wood Owl <i>Strix woodfordii</i>	X	X
Barred Owlet <i>Glaucidium capense</i>	X	O
Mangrove Kingfisher <i>Halcyon senegaloides</i>	O	X
Brown-hooded Kingfisher <i>Halcyon albiventris</i>	X	X
Lilac-breasted Roller <i>Coracias caudatus</i>	X	X
Broad-billed Roller <i>Eurystomus glaucurus</i>	O	X
European Bee-eater <i>Merops apiaster</i>	O	X
Swallow-tailed Bee-eater <i>Merops hirundineus</i>	X	O
Brown-headed Parrot <i>Poicephalus cryptoxanthus</i>	X	X
Crowned Hornbill <i>Tockus alboterminatus</i>	X	X
Trumpeter Hornbill <i>Bycanistes bucinator</i>	X	X
Green Woodhoopoe <i>Phoeniculus purpureus</i>	X	X
Boehm’s Spinetail <i>Neafrapus boehmi</i>	X	X
Mottled Spinetail <i>Telacanthura ussheri</i>	X	X
Red-chested Cuckoo <i>Cuculus solitarius</i>	O	X
Klaas’s Cuckoo <i>Chrysococcyx klaas</i>	O	X
Jacobin Cuckoo <i>Clamator jacobinus</i>	O	X
Green Malkoha <i>Ceuthmochares aereus</i>	X	X
Scaly-throated Honeyguide <i>Indicator variegatus</i>	X	O
Lesser Honeyguide <i>Indicator minor</i>	X	O
Black-collared Barbet <i>Lybius torquatus</i>	O	X
Yellow-rumped Tinkerbird <i>Pogoniulus bilineatus</i>	X	X
Eastern Green Tinkerbird <i>Viridibucco simplex</i>	O	X
Golden-tailed Woodpecker <i>Campethera abingoni</i>	X	X
African Broadbill <i>Smithornis capensis</i>	O	X
Square-tailed Drongo <i>Dicrurus ludwigii</i>	X	X
Black-headed Oriole <i>Oriolus larvatus</i>	X	X
European Golden Oriole <i>Oriolus oriolus</i>	O	X
Southern Black Tit <i>Parus niger</i>	X	O
Dark-capped Bulbul <i>Pycnonotus tricolor</i>	X	X
Terrestrial Brownbul <i>Phyllastrephus terrestris</i>	X	X
Tiny Greenbul <i>Phyllastrephus debilis</i>	O	X
Yellow-bellied Greenbul <i>Chlorocichla flaviventris</i>	X	X
Sombre Greenbul <i>Andropadus importunus</i>	X	X
Eastern Nicator <i>Nicator gularis</i>	O	X
White-throated Robin-Chat <i>Cossypha humeralis</i>	X	X
Red-capped Robin-Chat <i>Cossypha natalensis</i>	X	X
Bearded Scrub-Robin <i>Erythropygia quadrivirgata</i>	X	X
White-browed Scrub-Robin <i>Erythropygia leucophrys</i>	O	X
Rudd’s Apalis <i>Apalis ruddi</i>	X	X
Black-headed Apalis <i>Apalis melanocephala</i>	X	X
Yellow-breasted Apalis <i>Apalis flavida</i>	X	X
Green-backed Camaroptera <i>Camaroptera brachyura</i>	X	X
European Marsh Warbler <i>Acrocephalus palustris</i>	O	X
Willow Warbler <i>Phylloscopus trochilus</i>	O	X

SPECIES	JUNE 2011	JANUARY 2013
Livingstone's Flycatcher <i>Erythrocerus livingstonei</i>	X	X
Grey Tit-Flycatcher <i>Myioparus plumbeus</i>	O	X
Ashy Flycatcher <i>Muscicapa caerulescens</i>	O	X
Pale Flycatcher <i>Bradornis pallidus</i>	X	O
African Paradise-Flycatcher <i>Terpsiphone viridis</i>	X	O
Black-bellied Starling <i>Notopholia corrusca</i>	O	X
Grey-headed Bush Shrike <i>Malaconotus blanchoti</i>	X	O
Olive Bush Shrike <i>Telophorus olivaceus</i>	O	X
Orange-breasted Bush Shrike <i>Telophorus sulfureopectus</i>	O	X
Gorgeous Bush Shrike <i>Telophorus quadricolor</i>	X	X
Southern Boubou <i>Laniarius ferrugineus</i>	X	X
Woodwards' Batis <i>Batis fratrum</i>	X	X
Black-backed Puffback <i>Dryoscopus cubla</i>	X	X
Chestnut-fronted Helmetshrike <i>Prionops scopifrons</i>	O	X
Plain-backed Sunbird <i>Anthreptes reichenowi</i>	X	X
Collared Sunbird <i>Hedydipna collaris</i>	X	X
Purple-banded Sunbird <i>Cinnyris bifasciatus</i>	X	X
Grey Sunbird <i>Cyanomitra veroxii</i>	X	X
Yellow White-eye <i>Zosterops senegalensis</i>	X	O
Spectacled Weaver <i>Ploceus ocularis</i>	X	O
Dark-backed Weaver <i>Ploceus bicolor</i>	X	X
Yellow-rumped Widowbird <i>Euplectes capensis</i>	O	X
Bronze Mannikin <i>Lonchura cucullata</i>	X	O
Red-backed Mannikin <i>Lonchura bicolor</i>	X	X
Jameson's Firefinch <i>Lagonosticta rhodopareia</i>	O	X
Red-throated Twinspot <i>Hypargos niveoguttatus</i>	O	X
Blue Waxbill <i>Uraeginthus angolensis</i>	O	X
Yellow-fronted Canary <i>Crithagra mozambica</i>	X	X

APPENDIX 2

Gazetteer of localities mentioned in the text

Bobiane 23° 02' 59.88" S; 35° 03' 59.88" E	Inharrime 24° 28' 39.41" S; 35° 01' 34.51" E	Pomene 22° 57' 56.61" S; 35° 33' 17.46" E
Chicumbane 24° 58' 17.19" S; 33° 32' 22.95" E	Mabote 22° 02' 28.01" S; 34° 07' 57.29" E	Rumbacaca 21° 48' 48.18" S; 34° 54' 16.13" E
Chimonzo 24° 56' 03.14" S; 33° 21' 33.77" E	Macia (town) 25° 01' 37.46" S; 33° 05' 46.61" E	Sitila 23° 09' 57.99" S; 35° 03' 32.08" E
Chinzavane 23° 33' 53.35" S; 35° 00' 02.46" E	Mapinhane 22° 15' 47.46" S; 35° 06' 51.33" E	Ungwana 23° 03' 47.01" S; 35° 16' 07.52" E
Coguno 24° 23' 21.02" S; 34° 33' 07.60" E	Massinga 23° 19' 38.21" S; 35° 22' 52.79" E	Vilanculos 21° 59' 57.71" S; 35° 19' 07.12" E
Davide 24° 27' 06.60" S; 34° 45' 40.13" E	Maxixe 23° 51' 44.43" S; 35° 20' 48.08" E	Zandamela 24° 44' 04.48" S; 34° 35' 57.18" E
Dombe 19° 58' 29.72" S; 33° 23' 51.07" E	Morrungolo 23° 14' 01.42" S; 35° 29' 24.28" E	
Funhalouro 23° 05' 29.88" S; 34° 23' 01.62" E	Nhachengue 22° 50' 45.50" S; 35° 10' 42.60" E	
Homoine 23° 53' 02.05" S; 35° 09' 07.30" E	Panda (town) 24° 03' 46.59" S; 34° 43' 38.68" E	