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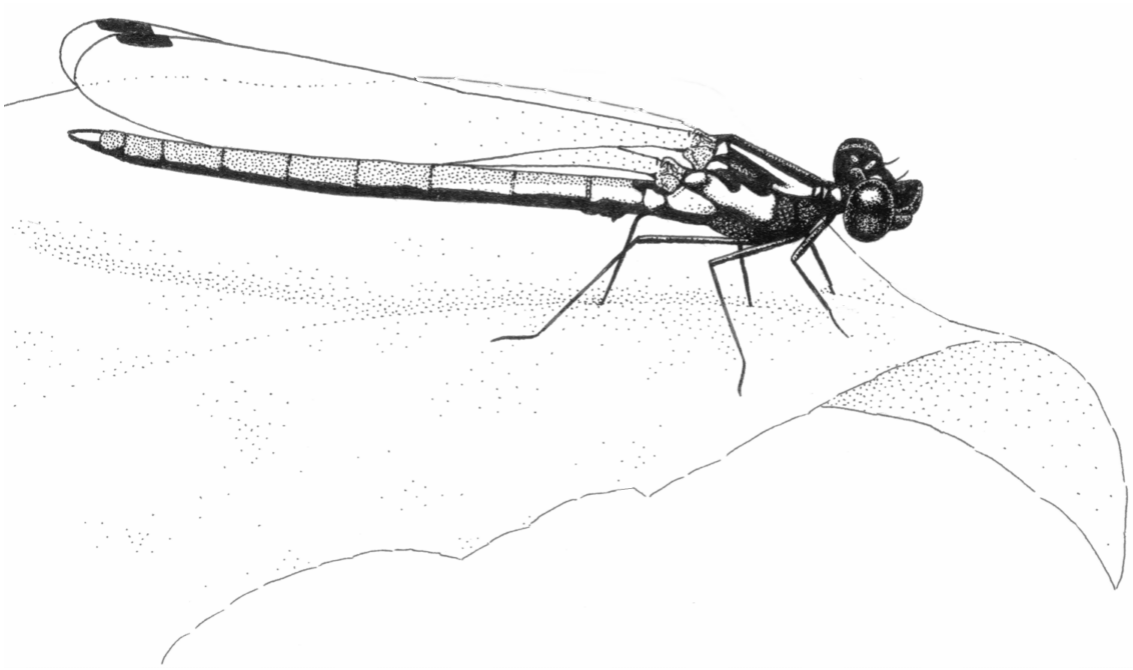

A Journal of Biodiversity

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Front cover: Chlorocypha tenuis*, a species of damselfly found in Kakamega Forest. Drawing by K.-D. B. Dijkstra.*

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A CONTRIBUTION TO THE AVIFAUNA OF THE *ACACIA* WOODLANDS IN BURUNGE WILDLIFE MANAGEMENT AREA, NORTHERN TANZANIA

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ABSTRACT

Wildlife management areas (WMAs) have been used as a wildlife conservation model with a dual purpose: improving wildlife conservation and livelihoods of rural communities. While some WMAs such as Burunge WMA have been found to support species-rich and abundant wildlife communities, particularly large mammals, some wildlife taxa, including birds, have not been thoroughly studied. This study reports on the bird species (as well as their relative abundances) found in *Acacia* woodlands in Burunge WMA. From 106, 20-species lists, 145 species were observed, including 22 out of 77 Somali – Masai biome-restricted species found in Tanzania. The results suggest that the *Acacia* woodlands in Burunge WMA provide habitats for a diversity of birds. Given the diverse avifauna, the Burunge WMA remains as an important birding site within the Tarangire – Manyara ecosystem, and therefore, improving awareness will not only make the area potential for avitourism, but also encourage further avian research.

Keywords: *Acacia* woodland, birds, Burunge Wildlife Management Area, conservation, diversity

INTRODUCTION

Wildlife management areas (WMAs) have been used as a wildlife conservation model with a dual purpose: improving wildlife conservation and livelihoods of rural communities living near strictly protected areas (see Salerno *et al.,* 2016). They are technically village lands which were designed as a conservation intervention to safeguard wildlife and their habitats outside the core protected areas. In so doing, WMA halt overall biodiversity declines (Berkes, 2004; Kiss, 2004). In designing the WMAs, it has been a strategy to provide opportunities for local communities to derive economic benefits from wildlife-based enterprises on their land to develop a sense of resource ownership and realize the tangible benefits that can accrue from wildlife conservation, so that they develop a positive attitude towards conservation issues. Conservation of natural resources in WMAs is therefore a shared responsibility and local communities must significantly benefit from it (Stolla, 2005; URT, 2009). In managing WMAs, the rural communities are thus recognised as important stakeholders in the wildlife conservation. Such WMAs in Tanzania include Burunge Wildlife Management Area (WMA), in Northern Tanzania. This WMA lies within the Tarangire-Manyara ecosystem and shares its eastern border with Tarangire National Park. The WMA has been found to provide suitable habitats for migratory ungulates [*e.g.* common wildebeest *Connochaetes taurinus* (Burchell, 1823) and plains zebra *Equus burchelli* (Gray, 1824)] and non-migratory ungulates [*e.g.* Kirk's dik-dik *Madoqua kirkii* (Günther, 1880), impala *Aepyceros melampus* (Lichtenstein, 1812) and giraffe *Giraffa camelopardalis* (Linnaeus, 1758)] (Kiffner *et al.*, 2020). This WMA helps to maintain habitat connectivity within the increasingly fragmented Tarangire-Manyara ecosystem (Morrison *et al.*, 2016; Bond *et al.*, 2017) and provides complementary conservation roles in the ecosystem which cannot be achieved by the current national park network alone (Caro *et al.*, 2009)

The existing biodiversity surveys in Burunge WMA have been biased towards large mammals (Lee, 2018; Kiffner *et al.*, 2020). This WMA has rich mammalian diversity and supports similar mammal species richness and densities with Tarangire National Park (Kiffner *et al.*, 2020). Avian studies in Burunge WMA and in the general area where this WMA is located are few. The existing avian studies include those of Mawi (2007) and Werema (unpubl. data). Mawi (2007) investigated the response of 16 species of raptors to land use changes in Kwakuchinja wildlife corridor of which this WMA is part. Werema (unpubl. data) surveyed birds in a small

section of an *Acacia* woodland in the eastern part of Burunge WMA and compared relative abundances of birds in the *Acacia* woodland in the WMA with a similar woodland in the Tarangire National Park. A total of 105 bird species were recorded with the two areas sharing a number of species. Since the study by Werema (unpubl. data) covered a small section of the *Acacia* woodland in Burunge WMA, as an attempt to provide baseline information on the woodland avifauna of this WMA, I extended the coverage by sampling the entire area where the *Acacia* woodlands dominate. The main aim of this survey was to establish a bird species list in the *Acacia* woodlands found in Burunge WMA.

MATERIALS AND METHODS

Study area

Burunge WMA is found in the Tarangire-Manyara ecosystem and measures 226 km^2 (excluding Lake Burunge; figure 1). The vegetation consists of a mosaic of grassland, bushland, bushed grassland, and *Acacia* woodland (Moe *et al* ., 1990). Mean total annual rainfall is ca. 650 mm (Foley & Faust, 2010) and elevation is ca. 1000 m.

The *Acacia* woodland habitat consists of varied amounts of trees with crown cover mostly ranging from 30-70% (figure 2). In some places there were closed stands of *Acacia tortilis* (Forssk.) Hayne and *A. kirkii* Oliv., which were the commonest tree species. *A. tortilis* was particularly common along the Tarangire River. Other tree species included baobab *Adansonia digitata* L., *A. xanthophloea* Benth., *Balanites aegyptiaca* (L.) Delile, *Commiphora africana* (A.Rich.) Engl, *Dichrostachys cinerea* (L.) Wight & Arn., *Salvadora persica* L. and *Hyphaene compressa* H.Wendl (see figure 2). The latter species was particularly common in the northern section of the WMA. In some places, particularly along the streams there were *Ficus* sp. and *Tamarindus indica* L. Within the woodlands there are few open patches of grassland (figure 2).

Data collection

Birds were surveyed using a modified "20-species method" (MacKinnon & Phillipps, 1993; see Fjeldså, 1999). This is a much preferred method compared to other methods such as point counts and transects because it is time efficient as the entire available time is used in data recording (Fjeldså, 1999). Similarly, this method is observer independent due to its relatively lower susceptibility to differences in ability and concentration of the observer (Robertson & Liley, 1998). In each day of sampling, I walked slowly in the *Acacia* woodland while observing, counting and recording birds up to 20 species. Once the first list of 20 species was complete, another list was compiled immediately hereafter, and so on. Birds were recorded within an estimated distance of 50 m on each side of the transect. Each list compiled was considered a transect and observations were conducted from sunrise to sunset, with brief notes made describing unidentified birds or vocalizations, allowing for later identification (see Fjeldså, 1999). Starting points were pre-established to ensure that the microhabitats in the woodlands were surveyed (figures 1 & 2). Surveys were conducted between 26 August and 8 September 2021 during the dry season. For some species such as sunbirds, weavers, and widowbirds, which could not be identified properly during August and September, to aid in identification of such species, field surveys were also conducted between 9 and 10 December 2021, during the short rainy season when these species were in breeding plumage.

Despite the brevity of the study, bird species abundance was expressed in terms of relative abundance (Ra). The Ra as an index of bird abundance allowed for a general assessment of the abundance of different species in the woodland which will be useful for the future comparisons should similar monitoring surveys be conducted in the WMA. Relative abundance (Ra) of each species, was expressed as the proportion of lists at which a species was detected (see Hutto & Patterson, 2016). This was calculated by summing the number of 20-species lists in which the species was observed and dividing by the total number of lists conducted in the WMA (*i.e.* 106 lists).

The English and scientific names of species follow the IOC world bird list (www.worldbirdnames.org (see Gill *et al* ., 2021).

RESULTS

A total of 145 species were observed from 106, 20-species lists (appendix 1). Species whose relative abundance was at least 50% included slate-colored boubou *Laniarius funebris* (Ra = 84.9), emerald-spotted wood-dove *Turtur chalcospilos* (Ra = 77.4), ring-necked dove *Streptopelia capicola* (Ra = 63.2) and ashy starling *Lamprotornis unicolor* (Ra = 56.6) (appendix 1). Others were mourning collared dove *Streptopelia*

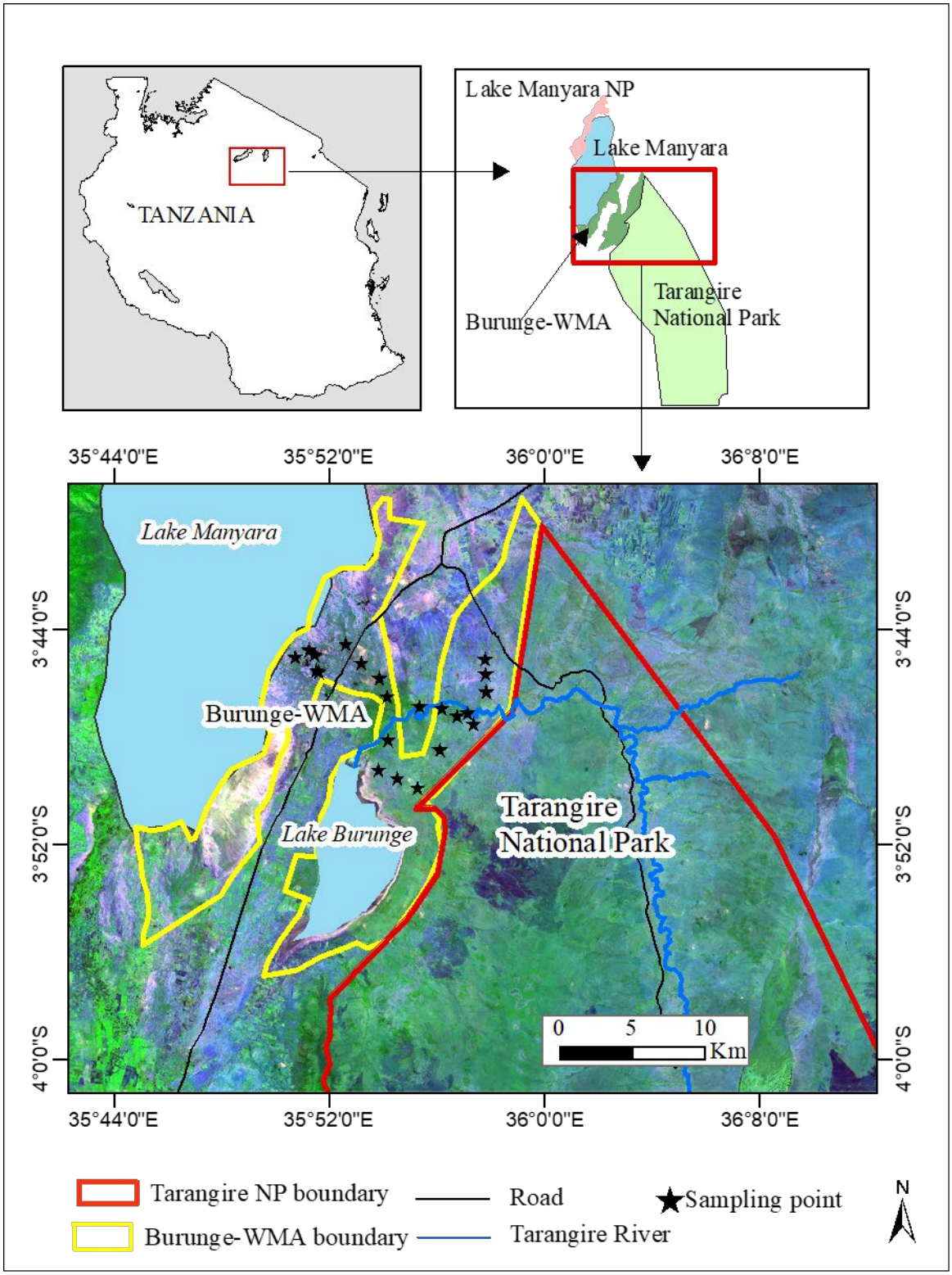

Figure 1. Map of Burunge WMA showing sites at which sampling was conducted.

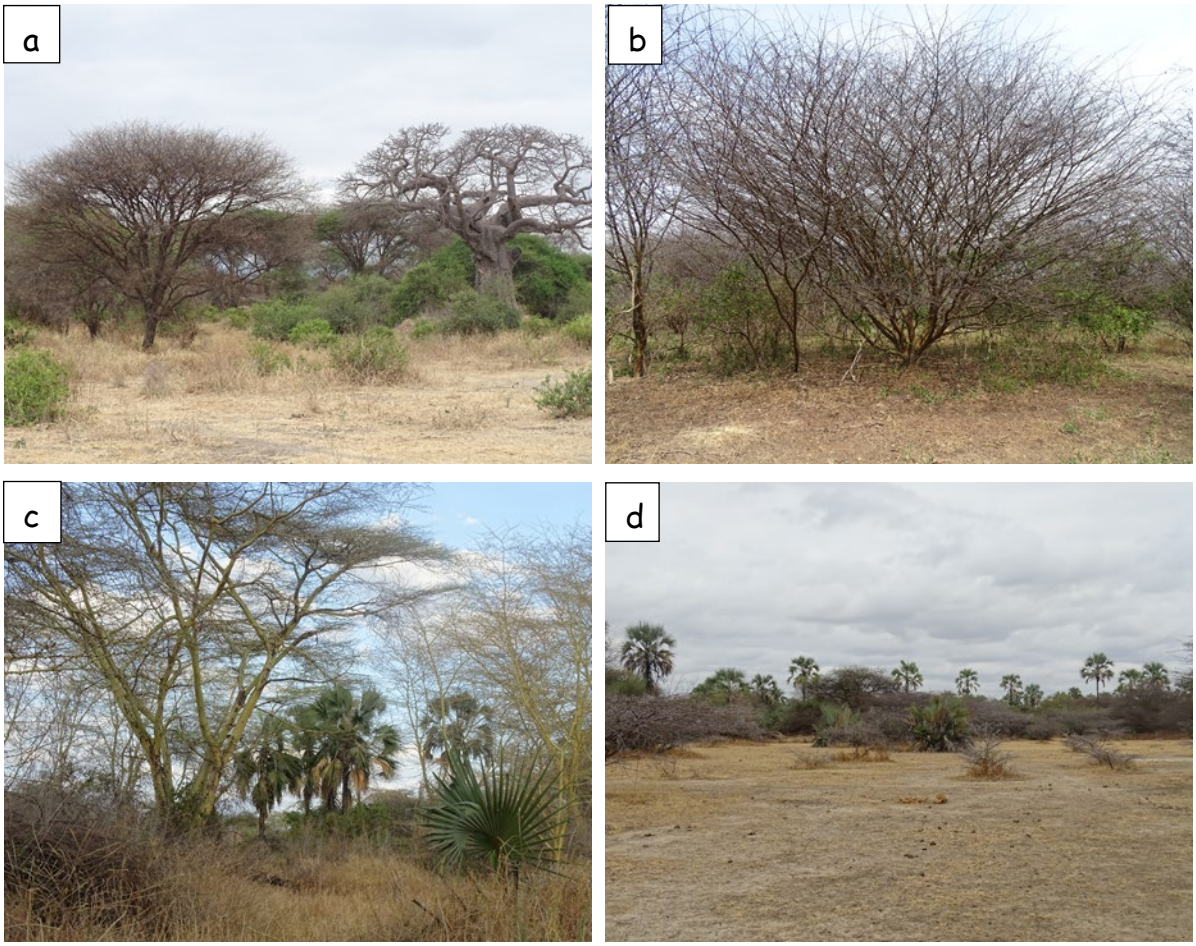

Figure 2. Acacia woodlands in Burunge WMA. (a) Acacia tortilis *woodland with* Adansonia digitata*, (b) a close stand of* Acacia kirkii*, (c)* Acacia xanthophloea *with* Hyphaene compressa*, and (d) One of the grassland patches in a woodland dominated by* Acacia *sp. and* Hyphaene compressa*. Note that the study was conducted during the dry season*.

decipiens (Ra = 54.7), dark-capped bulbul *Pycnonotus tricolor* (52.8), grey-backed camaroptera *Camaroptera brevicaudata* ((Ra = 52.8) and fork-tailed drongo *Dicrurus adsimilis* (Ra = 50.9) (appendix 1). Fifty-one species, including most raptors, had low relative abundances as they were observed either once or twice only (appendix 1).

Twenty-two species out of a country total of 77 were Somali – Masai biome restricted species, including the yellow-collared lovebird *Agapornis personatus* and ashy starling, which are endemic to Tanzania (appendix 1, Fishpool & Evans, 2001). Other species recorded included two Palearctic migrants: red-backed shrike *Lanius collurio* and willow warbler *Phylloscopus trochilus.* Species of conservation concern included white-backed vulture *Gyps africanus* and Rüppell's vulture *Gyps rueppelli*, which are both critically endangered, and bateleur *Terathopius ecaudatus* which is endangered (IUCN, 2021).

DISCUSSION

This study has provided a preliminary baseline of bird species found in the *Acacia* woodlands in Burunge WMA. Species with high relative abundances were those that were abundant in the *Acacia* woodlands, and *vice versa*, and these abundances are useful for the future comparisons should similar monitoring surveys be conducted. While comparing the avifauna of a section of an *Acacia* woodland in Burunge WMA with a similar woodland type in Tarangire National Park, Werema (unpubl. data) recorded 81 species, of which 74 were observed during the current study. Thus with 145 species that were recorded during the current study, seven more species, speckled pigeon *Columba guinea* Linnaeus, 1758, southern ground hornbill *Bucorvus leadbeateri* (Vigors, 1825), African golden oriole *Oriolus auratus* Vieillot, 1817, bar-throated apalis *Apalis thoracica* (Shaw, 1811), northern pied babbler *Turdoides hypoleuca* (Cabanis, 1878), pale flycatcher

Melaenornis pallidus (Müller, JW, 1851) and black-headed weaver *Ploceus melanocephalus* (Linnaeus, 1758) have been recorded in a woodland dominated by *Acacia tortilis* in Burunge WMA by Werema (unpubl. data). This makes a total of 152 bird species that have been recorded in *Acacia* woodlands in Burunge WMA. In comparison with other *Acacia* woodlands, these results suggest that the *Acacia* woodlands in Burunge WMA have diverse avifauna. For example, in the mixed *Acacia* and *Acacia robusta* Burch. woodlands in the Serengeti ecosystem, Werema (2021a) recorded a total of 82 bird species. To the west of the study area, in Nzega, central Tanzania, in a woodland dominated by *Acacia* species, Werema (2021b) recorded 122 species, a number which is relatively lower than that recorded in Burunge WMA. Another example is a study by Monadjem & Virani (2016) who recorded 88 species in a riparian habitat comprising predominantly of tall-standing *Acacia xanthophloea* (*Vachellia xanthophloea* (Benth.) P.J.H.Hurter) and *A. kirkii* (*V. kirkii* (Oliv.) Kyal. & Boatwr.) in Mara Naboisho Conservancy, Kenya. Further south, in the lowveld of Eswatini, Monadjem (2002) recorded a total of 128 species in *Acacia* savanna, a number which is also lower than that recorded during the current study.

The relatively high diversity of birds found in the *Acacia* woodland in Burunge WMA could be due to the presence of other tree species found in the study area, which possibly increased habitat heterogeneity (see figure 2). These tree species could have increased nesting, foraging and perching opportunities for a number of bird species. For example, *A. digitata* could have attracted some species for perching (*e.g.* African fish eagle *Haliaeetus vocifer* and grey kestrel *Falco ardosiaceus*) and nesting (*e.g.* hamerkop *Scopus umbretta*, red-bellied parrot *Poicephalus rufiventris*, yellow-collared lovebird and red-billed buffalo weaver *Bubalornis niger*) (pers. observ.). Even in other parts of the Tarangire-Manyara ecosystem, *A. digitata* has been observed to be an important perching and nesting resource for vultures in Tarangire National Park (pers. observ.). These observations are further supported by the fact that *A. digitata* has been found to be preferred for nesting by some of the species recorded during the current study, including the yellow-collared lovebird (Fry *et al.*, 1988) and red-billed buffalo-weaver (Fry & Keith, 2004). Similarly, the presence of different-sized *Acacia* trees and *A. digitata* (see figure 2) probably attracted the potential cavity-nesting bird species, including northern red-billed hornbill *Tockus erythrorhynchus*, Von der Decken's hornbill *Tockus deckeni*, African grey hornbill *Lophoceros nasutus,* lilac-breasted roller *Coracias caudatus*, red-bellied parrot, yellow-collared lovebird and woodpeckers (Nubian woodpecker *Campethera nubica*, bearded woodpecker *Chloropicus namaquus,* cardinal woodpecker *Dendropicos fuscescens* and African grey woodpecker *Dendropicos goertae*). These results suggest that the presence of large-sized trees lead to increase in availability of critical nesting and foraging habitats (see Nkwabi *et al.*, 2019). Additionally, perhaps the presence of a few open patches of grasslands (see figure 2) also increased the diversity of microhabitats within the *Acacia* woodlands in the WMA. Open grasslands attracted species such as crowned lapwing, Namaqua dove *Oena capensis* and double-banded courser *Rhinoptilus africanus* of which the latter was found to breed in such patches (an individual was observed incubating an egg).

The results further suggest that the *Acacia* woodlands in Burunge WMA were important for a number of bird species including bare-faced go-away bird *Crinifer personatus*, white-bellied go-away bird *Crinifer leucogaster*, red-bellied parrot and yellow-collared lovebird, which have been recorded to prefer *Acacia* woodlands (Fry *et al.*, 1988). Some of these bird species feed on *Acacia* seeds (*e.g.* bare-faced go-away bird), flowers of *Acacia* and green pods of *A. tortilis* (*e.g.* white-bellied go-away bird) (Fry *et al.*, 1988). Other species found in the *Acacia* woodlands have been recorded to forage in canopy trees especially *A. tortilis* (*e.g.* lesser masked weaver *Ploceus intermedius*; Fry & Keith, 2004).

The importance of the *Acacia* woodlands in Burunge WMA is not limited to supporting a diverse avifauna, but also in accommodating 23 species (including the northern pied babbler which was recorded by Werema (unpubl. data)) out of a country total of 77 Somali – Masai biome restricted species (Baker & Baker, 2002). Biome restricted species are species that are largely or wholly confined to a particular biome (Fishpool & Evans, 2001) and are likely to be negatively affected by destruction and degradation of the respective biome. The conservation importance of *Acacia* woodlands in Burunge WMA is further supported by the fact that this WMA lies between three important bird areas: Lake Manyara National Park, Tarangire National Park, and Lake Burunge (see Baker & Baker, 2002). It thus forms a corridor by connecting the three important bird areas and two National Parks (Lake Manyara and Tarangire).

In conclusion, the present study has provided additional preliminary data on the birds found in the *Acacia* woodlands in Burunge WMA. These data can be used as ecological benchmarks for further surveys. While the original idea of forming the WMA probably did not consider conserving birds, with 152 bird species inhabiting the *Acacia* woodlands (including 23 out of 77 Somali – Masai biome-restricted species found in Tanzania), the results of the present study and those of Werema (unpubl. data) indicate that *Acacia* woodlands in Burunge WMA have diverse avifauna. Furthermore, the findings of this study suggest that the *Acacia* woodlands surveyed are not homogeneous, but there are differences within them that determine bird

community structure (see Monadjem, 2002) and diversity. Thus Burunge WMA, being a village land, is a good birding spot for avitourists. It is important to note that there are almost certainly species of birds that occur in the *Acacia* woodlands in Burunge WMA that were not observed. As such, additional surveys, particularly during the wet season, are needed to fully document the avifauna occurring in the *Acacia* woodlands in this WMA.

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Appendix 1. Frequency of occurrence (Freq.) and relative abundance (Ra) of bird species observed in the *Acacia* woodlands in Burunge Wildlife Management Area. * = Somali – Masai biome restricted species.

Common name and species name	Freq.	Ra
Helmeted guineafowl *Numida meleagris* (Linnaeus, 1758)	10	9.4
Crested francolin *Dendroperdix sephaena* (Smith, A, 1836)	47	44.3
Red-necked spurfowl *Pternistis afer* (Müller, PLS, 1776)	2	1.9
*Yellow-necked spurfowl *Pternistis leucoscepus* (Gray, GR, 1867)	1	0.9
Harlequin Quail*Coturnix delegorguei* Delegorgue, 1847	2	1.9
Slender-tailed nightjar *Caprimulgus clarus* Reichenow, 1892	3	2.8
African palm swift *Cypsiurus parvus* (Lichtenstein, MHK, 1823)	36	34.0
Bare-faced go-away-bird *Crinifer personatus* (Rüppell, 1842)	23	21.7
*White-bellied go-away-bird *Crinifer leucogaster* (Rüppell, 1842)	33	31.1
White-browed coucal *Centropus superciliosus* Hemprich & Ehrenberg, 1829	8	7.5
Red-chested cuckoo *Cuculus solitarius* Stephens, 1815	4	3.8
Black-faced sandgrouse *Pterocles decoratus* Cabanis, 1868	1	0.9
Mourning collared dove *Streptopelia decipiens* (Hartlaub & Finsch, 1870)	58	54.7
Red-eyed dove *Streptopelia semitorquata* (Rüppell, 1837)	1	0.9
Ring-necked dove *Streptopelia capicola* (Sundevall, 1857)	67	63.2
Laughing dove *Spilopelia senegalensis* (Linnaeus, 1766)	5	4.7
Emerald-spotted wood-dove *Turtur chalcospilos* (Wagler, 1827)	82	77.4
Namaqua dove *Oena capensis* (Linnaeus, 1766)	11	10.4
Water thick-knee *Burhinus vermiculatus* (Cabanis, 1868)	1	0.9
Crowned lapwing *Vanellus coronatus* (Boddaert, 1783)	2	1.9
Double-banded courser *Rhinoptilus africanus* (Temminck, 1807)	1	0.9
Hadada ibis *Bostrychia hagedash* (Latham, 1790)	2	1.9
Western cattle egret *Bubulcus ibis* (Linnaeus, 1758)	1	0.9
Hamerkop *Scopus umbretta* Gmelin, JF, 1789	2	1.9
Secretarybird *Sagittarius serpentarius* (Miller, JF, 1779)	1	0.9
African harrier-hawk *Polyboroides typus* Smith, A, 1829	2	1.9
White-backed vulture *Gyps africanus* Salvadori, 1865	2	1.9

Common name and species name	Freq.	Ra
Rüppell's vulture *Gyps rueppelli* (Brehm, AE, 1852)	2	1.9
Black-chested snake eagle *Circaetus pectoralis* Smith, A, 1829	1	0.9
Brown snake eagle *Circaetus cinereus* Vieillot, 1818	2	1.9
Bateleur *Terathopius ecaudatus* (Daudin, 1800)	1	0.9
Lizard buzzard *Kaupifalco monogrammicus* (Temminck, 1824)	2	1.9
African goshawk *Accipiter tachiro* (Daudin, 1800)	3	2.8
Little sparrowhawk *Accipiter minullus* (Daudin, 1800)	1	0.9
African fish eagle *Haliaeetus vocifer* (Daudin, 1800)	1	0.9
Augur buzzard *Buteo augur* (Rüppell, 1836)	2	1.9
Pearl-spotted owlet *Glaucidium perlatum* (Vieillot, 1817)	2	1.9
Grey kestrel *Falco ardosiaceus* Vieillot, 1823	3	2.8
Speckled mousebird *Colius striatus* Gmelin, JF, 1789	34	32.1
Blue-naped mousebird *Urocolius macrourus* (Linnaeus, 1766)	50	47.2
Green wood hoopoe *Phoeniculus purpureus* (Miller, JF, 1784)	5	4.7
*Abyssinian scimitarbill *Rhinopomastus minor* (Rüppell, 1845)	1	0.9
Northern red-billed hornbill *Tockus erythrorhynchus* (Temminck, 1823)	14	13.2
*Von der Decken's hornbill *Tockus deckeni* (Cabanis, 1868)	35	33.0
African grey hornbill *Lophoceros nasutus* (Linnaeus, 1766)	4	3.8
Lilac-breasted roller *Coracias caudatus* Linnaeus, 1766	13	12.3
Grey-headed kingfisher *Halcyon leucocephala* (Müller, PLS, 1776)	27	25.5
Striped kingfisher *Halcyon chelicuti* (Stanley, 1814)	1	0.9
Woodland kingfisher *Halcyon senegalensis* (Linnaeus, 1766)	1	0.9
African pygmy kingfisher *Ispidina picta* (Boddaert, 1783)	3	2.8
Little bee-eater *Merops pusillus* Müller, PLS, 1776	14	13.2
Olive bee-eater *Merops superciliosus* Linnaeus, 1766	5	4.7
Spot-flanked barbet *Tricholaema lacrymosa* Cabanis, 1878	8	7.5
*Red-and-yellow barbet *Trachyphonus erythrocephalus* Cabanis, 1878	4	3.8
*D'Arnaud's barbet *Trachyphonus darnaudii* (Prévost & Des Murs, 1847)	2	1.9
Red-fronted tinkerbird *Pogoniulus pusillus* (Dumont, 1805)	10	9.4
Lesser honeyguide *Indicator minor* Stephens, 1815	6	5.7
Greater honeyguide *Indicator indicator* (Sparrman, 1777)	9	8.5
Nubian woodpecker *Campethera nubica* (Boddaert, 1783)	50	47.2
Bearded woodpecker *Chloropicus namaquus* (Lichtenstein, AAH, 1793)	3	2.8
Cardinal woodpecker *Dendropicos fuscescens* (Vieillot, 1818)	18	17.0
African grey woodpecker *Dendropicos goertae* (Müller, PLS, 1776)	4	3.8
Pygmy falcon *Polihierax semitorquatus* (Smith, A, 1836)	1	0.9
*Red-bellied parrot *Poicephalus rufiventris* (Rüppell, 1842)	7	6.6
*Yellow-collared lovebird *Agapornis personatus* Reichenow, 1887	52	49.1
Chinspot batis *Batis molitor* (Küster, 1836)	23	21.7
Grey-headed bushshrike *Malaconotus blanchoti* Stephens, 1826	1	0.9
Orange-breasted bushshrike *Chlorophoneus sulfureopectus* (Lesson, R, 1831)	36	34.0
Brown-crowned tchagra *Tchagra senegalus* (Smith, A, 1836)	23	21.7
Black-backed puffback *Dryoscopus cubla* (Latham, 1801)	40	37.7
Tropical boubou *Laniarius major* (Hartlaub, 1848)	3	2.8
Slate-colored boubou *Laniarius funebris* (Hartlaub, 1863)	90	84.9
White-crested helmetshrike *Prionops plumatus* (Shaw, 1809)	7	6.6
Black cuckooshrike *Campephaga flava* Vieillot, 1817	1	0.9

Common name and species name	Freq.	Ra
Red-backed shrike *Lanius collurio* Linnaeus, 1758	3	2.8
Brubru *Nilaus afer* (Latham, 1801)	35	33.0
Magpie shrike *Urolestes melanoleucus* (Jardine, 1831)	15	14.2
Northern white-crowned shrike *Eurocephalus ruppelli* Bonaparte, 1853	43	40.6
*Long-tailed fiscal *Lanius cabanisi* Hartert, E, 1906	2	1.9
Black-headed oriole *Oriolus larvatus* Lichtenstein, MHK, 1823	12	11.3
Fork-tailed drongo *Dicrurus adsimilis* (Bechstein, 1794)	54	50.9
African paradise flycatcher *Terpsiphone viridis* (Müller, PLS, 1776)	45	42.5
Pied crow *Corvus albus* Müller, PLS, 1776	1	0.9
Flappet lark *Mirafra rufocinnamomea* (Salvadori, 1866)	2	1.9
Yellow-bellied greenbul *Chlorocichla flaviventris* (Smith, A, 1834)	12	11.3
Dark-capped bulbul *Pycnonotus tricolor* (Hartlaub, 1862)	56	52.8
Wire-tailed swallow *Hirundo smithii* Leach, 1818	1	0.9
Lesser striped swallow *Cecropis abyssinica* (Guérin-Méneville, 1843)	4	3.8
Red-rumped swallow *Cecropis daurica* (Laxmann, 1769)	2	1.9
Red-faced crombec *Sylvietta whytii* Shelley, 1894	32	30.2
Willow warbler *Phylloscopus trochilus* (Linnaeus, 1758)	3	2.8
Rattling cisticola *Cisticola chiniana* (Smith, A, 1843)	8	7.5
Tawny-flanked prinia *Prinia subflava* (Gmelin, JF, 1789)	25	23.6
Buff-bellied warbler *Phyllolais pulchella* (Cretzschmar, 1830)	5	4.7
Yellow-breasted apalis *Apalis flavida* (Strickland, 1853)	45	42.5
Grey-backed camaroptera *Camaroptera brevicaudata* (Cretzschmar, 1830)	56	52.8
Yellow-bellied eremomela *Eremomela icteropygialis* (Lafresnaye, 1839)	1	0.9
*Banded parisoma *Sylvia boehmi* (Reichenow, 1882)	13	12.3
Pale white-eye *Zosterops flavilateralis* Reichenow, 1892	13	12.3
Arrow-marked babbler *Turdoides jardineii* (Smith, A, 1836)	25	23.6
Wattled starling *Creatophora cinerea* (Meuschen, 1787)	2	1.9
Superb starling *Lamprotornis superbus* Rüppell, 1845	29	27.4
*Hildebrandt's starling *Lamprotornis hildebrandti* (Cabanis, 1878)	2	1.9
*Ashy starling *Lamprotornis unicolor* (Shelley, 1881)	60	56.6
Yellow-billed oxpecker *Buphagus africanus* Linnaeus, 1766	2	1.9
Red-billed oxpecker *Buphagus erythrorynchus* (Stanley, 1814)	8	7.5
*Bare-eyed thrush *Turdus tephronotus* Cabanis, 1878	14	13.2
White-browed scrub robin *Cercotrichas leucophrys* (Vieillot, 1817)	39	36.8
*African grey flycatcher *Melaenornis microrhynchus* (Reichenow, 1887)	40	37.7
Silverbird *Empidornis semipartitus* (Rüppell, 1840)	1	0.9
Ashy flycatcher *Muscicapa caerulescens* (Hartlaub, 1865)	8	7.5
Spotted palm thrush *Cichladusa guttata* (Heuglin, 1862)	50	47.2
White-browed robin-chat *Cossypha heuglini* (Gould, 1847)	11	10.4
Red-capped robin-chat *Cossypha natalensis* Smith, A, 1840	12	11.3
*Eastern violet-backed sunbird *Anthreptes orientalis* Hartlaub, 1880	28	26.4
Collared sunbird *Hedydipna collaris* (Vieillot, 1819)	4	3.8
Scarlet-chested sunbird *Chalcomitra senegalensis* (Linnaeus, 1766)	7	6.6
Beautiful sunbird *Cinnyris pulchellus* (Linnaeus, 1766)	16	15.1
Variable sunbird *Cinnyris venustus* (Shaw, 1799)	1	0.9
*Swahili sparrow *Passer suahelicus* Reichenow, 1904	14	13.2
Yellow-spotted bush Sparrow *Gymnoris pyrgita* (Heuglin, 1862)	1	0.9

Common name and species name	Freq.	Ra
Red-billed buffalo-weaver *Bubalornis niger* Smith, A, 1836	13	12.3
*White-headed buffalo-weaver *Dinemellia dinemelli* (Rüppell, 1845)	28	26.4
White-browed sparrow-weaver *Plocepasser mahali* Smith, A, 1836	1	0.9
*Rufous-tailed weaver *Histurgops ruficauda* Reichenow, 1887	1	0.9
Speckle-fronted weaver *Sporopipes frontalis* (Daudin, 1800)	2	1.9
Baglafecht weaver *Ploceus baglafecht* (Daudin, 1802)	1	0.9
Spectacled weaver *Ploceus ocularis* Smith, A, 1828	3	2.8
Black-necked weaver *Ploceus nigricollis* (Vieillot, 1805)	30	28.3
Holub's golden weaver *Ploceus xanthops* (Hartlaub, 1862)	6	5.7
Lesser masked weaver *Ploceus intermedius* Rüppell, 1845	24	22.6
Vitelline masked weaver *Ploceus vitellinus* (Lichtenstein, MHK, 1823)	7	6.6
Chestnut weaver *Ploceus rubiginosus* Rüppell, 1840	2	1.9
Red-headed weaver *Anaplectes rubriceps* (Sundevall, 1850)	3	2.8
Red-billed quelea *Quelea quelea* (Linnaeus, 1758)	3	2.8
*Grey-headed silverbill *Spermestes griseicapilla* (Delacour, 1943)	1	0.9
Common waxbill *Estrilda astrild* (Linnaeus, 1758)	1	0.9
*Purple grenadier *Granatina ianthinogaster* (Reichenow, 1879)	2	1.9
Red-cheeked cordon-bleu *Uraeginthus bengalus* (Linnaeus, 1766)	28	26.4
*Blue-capped cordon-bleu *Uraeginthus cyanocephalus* (Richmond, 1897)	5	4.7
Green-winged pytilia *Pytilia melba* (Linnaeus, 1758)	16	15.1
Red-billed firefinch *Lagonosticta senegala* (Linnaeus, 1766)	15	14.2
*Steel-blue whydah *Vidua hypocherina* Verreaux, J & Verreaux, É, 1856	6	5.7
Yellow-throated longclaw *Macronyx croceus* (Vieillot, 1816)	1	0.9
Yellow-rumped seedeater *Crithagra xanthopygia* (Rüppell, 1840)	4	3.8