

## AVIFAUNA OF VWAZA MARSH WILDLIFE RESERVE, MALAWI

Joshua I. Engel, John M. Bates, Jason D. Weckstein, Thomas P. Gnoske  
Zoology Department, Field Museum of Natural History  
1400 S. Lake Shore Drive, Chicago, Illinois 60605, USA  
jengel2@fieldmuseum.org, jrbates@fieldmuseum.org, jweckstein@fieldmuseum.org,  
tgnoske@fieldmuseum.org

Potiphar M. Kaliba<sup>1</sup>  
Museums of Malawi  
P.O. Box 30360, Chichiri, Blantyre 3, Malawi  
pmkaliba@yahoo.com

### ABSTRACT

Despite having a well-documented avifauna, some areas of Malawi, such as Vwaza Marsh Wildlife Reserve (986 km<sup>2</sup>), are still poorly known ornithologically. We spent 12 days in October 2009, before the wet season, and two days in November 2009, after the first rains, documenting the birds of Vwaza. We found six new species for the Reserve—red-chested flufftail, African pitta, African broadbill, African reed warbler, marsh tchagra, and dark-capped yellow warbler—and we recorded 56 new quadrat records, filling in distributional gaps in the Malawi bird atlas. Many of these records are documented with voucher specimens. Here we provide a complete list of the 394 species of birds known to occur in Vwaza Marsh Wildlife Reserve.

**Keywords:** Vwaza Marsh, Malawi, birds, protected areas, wetlands, miombo, Important Bird Area

### INTRODUCTION

Malawi is part of a region that represents a transition between east, central, and southern Africa. Although some of this region's bird distribution is documented through atlas projects (*e.g.* Kenya, Zambia, Uganda, forthcoming for Tanzania), given the scarcity of ornithologists and birders, it is no surprise that many gaps in our knowledge of bird distribution endure. Malawi is a small country with an atlas-level distribution of birds presented in *The Birds of Malawi* (Dowsett-Lemaire 2006; Dowsett-Lemaire & Dowsett, 2006); despite this, some parts of the country—including protected areas—have not been surveyed in detail. One of these areas is the northern sector of Vwaza Marsh Wildlife Reserve, which lies on the Zambian border in the north-western part of the country, *ca.* 140

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<sup>1</sup> Current address: Department of Antiquities, P.O. Box 264, Lilongwe, Malawi

km south of the Tanzanian border and *ca.* 140 km west of the Tanzanian shore of Lake Malawi (figure 1).

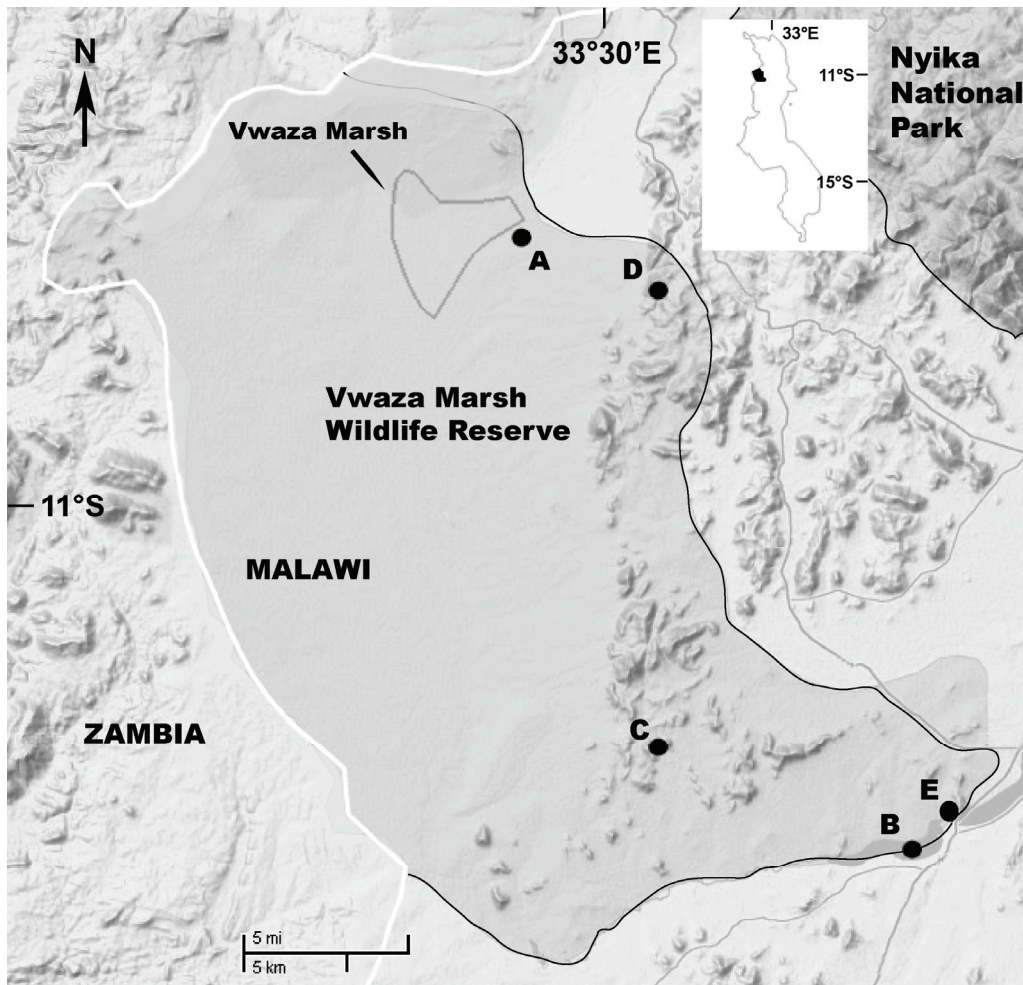


Figure 1. Map of Vwaza Marsh Wildlife Reserve with the primary survey localities indicated by letters. A=Camp; B=Lake Kazuni; C=Palm Grove; D=Hills near Kawiya Gate; E=Reserve Headquarters. The shaded areas bordered by solid black lines indicate protected areas.

Although Vwaza Marsh Wildlife Reserve is visited by tourists and birders, only a small area around the main office and the adjacent Lake Kazuni in the southeast has a well-studied avifauna. This is because of limited access to much of the Reserve. The northern area of the Reserve, including its namesake marsh and the surrounding miombo *Brachystegia* spp. woodland, has not been surveyed to any extent, despite containing the only known major populations in Malawi of babbling starling *Neocichla gutturalis* and chestnut-backed sparrow weaver *Plocepasser rufoscapulatus*. Here, we present the results of a research expedition undertaken in the Reserve by the Museums of Malawi and the Field Museum of Natural History (FMNH) from 7-18 October 2009, with additional fieldwork conducted on 21-22 November 2009.

### Description of the study area

Vwaza Marsh Wildlife Reserve (Reserve Headquarters: 11°08.033'S, 33°39.307'E; elevation 1092 m; all coordinates and elevations were taken with a handheld Garmin GPSMAP 76) lies in the northwest of Malawi, with Zambia on its western border and the South Rukuru River forming the southern boundary (figure 1). Gazetted as a Reserve in 1977 and expanded in 1985 (Mephram *et al.*, 1992), it covers 986 km<sup>2</sup> in Rumph District (McShane & McShane-Caluzi, 1988). Vwaza holds populations of large mammals, including bush elephant *Loxodonta africana* Blumenback 1797 and Cape buffalo *Syncerus caffer* Sparrman 1779.

Vwaza is largely wooded, dominated by miombo woodland with mopane *Colophospermum mopane* (Benth.) Leonard predominant in low-lying alluvial plains, mostly in the central and south-central areas of the Reserve. A strip of riverine woodland runs along the length of the Luwewe River (McShane & McShane-Caluzi, 1988), and mixed broadleaved woodland occurs along the edge of the floodplain of the South Rukuru River. Although most of our work was conducted in miombo woodland and wetland edges, we visited all of the major habitat types in the Reserve. For more detailed descriptions of the Reserve's habitats, see McShane & McShane-Caluzi (1988).

Vwaza Marsh, in the north of the Reserve, is a large wetland (ca. 40 km<sup>2</sup>) clogged with tall grasses, papyrus *Cyperus papyrus* L. and reeds. Although there was ample evidence that elephants and hippopotamus *Hippopotamus amphibius* Linnaeus 1758 use the marsh during the wet season, we observed these species only in southern sections of the Reserve during our stay. The marsh has permanent water, but the surrounding grasslands and the watercourses entering it are seasonally inundated and were dry during both of our visits. The southern section includes the South Rukuru River and lower Luwewe River. The South Rukuru-fed Lake Kazuni (ca. 2 km<sup>2</sup>) is the major permanent wetland in the region. Large mammals and water-birds occur along the South Rukuru River throughout the year.

### MATERIAL AND METHODS

Our fieldwork took place in 2009 at the end of the dry season (7-18 October) with a brief return after the first heavy rains (21-22 November). Our camp was located near the north-eastern boundary of the Reserve, in open miombo woodland, 100 m from the edge of Vwaza Marsh (10°52.726'S, 33°27.762'E; elevation 1170 m). One of the main foci of the fieldwork was a baseline survey of both internal and external parasites and pathogens. As such, many of the records presented here are represented by voucher bird specimens. During October, we ran three mist-net lines, including one from marsh-edge scrub into Vwaza Marsh proper, a second from thickets and open broadleaved woodland into grasslands adjacent to Vwaza Marsh, and a third in open miombo woodland. During the mornings we used shotguns to collect birds in the marsh-edge vegetation and miombo woodland close to camp. The purpose was to sample species not normally captured in mist nets. We obtained series of specimens for common species, but once these series had been collected, individuals of these species were released from the mist nets. In total, we collected 406 individuals of 118 species.

In October we also conducted two morning-long collecting trips to nearby parts of the Reserve; miombo-covered hills near the Kawiya Gate (10°54.029'S, 33°31.447'E; elevation 1557 m; hereafter "hills near Kawiya") and riparian woodland with many *Borassus aethiopum* Mart. palms along the dry riverbed of the Luwewe River (11°06.199'S, 33°31.433'E; elevation 1171 m; hereafter "palm grove") and the surrounding miombo woodland. We also took observational trips to Lake Kazuni. Upon our return to Vwaza

Marsh on 21-22 November 2009, we visited the South Rukuru River from Lake Kazuni to Zaro Pool (11° 11.646'S, 33° 28.316'E; elevation 1071 m) and revisited the palm grove.

## RESULTS

We recorded 228 species comprising 67 families (following the taxonomy of the Kenya checklist of the Bird Committee, 2009; for species that do not occur in Kenya, we follow Gill & Donsker, 2010). Although no major range extensions were recorded, we obtained 56 new quadrat records based on the data presented in Dowsett-Lemaire & Dowsett (2006), filling in distributional gaps for many species. Six species new to the Reserve's bird list also were found: red-chested flufftail *Sarothrura rufa*, African broadbill *Smithornis capensis*, African pitta *Pitta angolensis*, African reed warbler *Acrocephalus baeticatus*, dark-capped yellow warbler *Chloropeta natalensis*, and marsh tchagra *Tchagra minutus*.

The rainy season in Vwaza is typically November-April, with a mean annual rainfall of 800-1100 mm (McShane & McShane-Caluzi, 1988). During our October field work we experienced no rain, but upon our return in November the Reserve was much greener, having received two heavy, if localized, rains (Reserve personnel, pers. comm.). This coincided with an influx of migrant bird species, both Afrotropical and Palearctic. Migrants seen in much greater numbers in November included common buzzard *Buteo buteo*, Amur falcon *Falco amurensis*, common swift *Apus apus*, spotted flycatcher *Muscicapa striata*, and red-backed shrike *Lanius collurio*.

We observed little active breeding at Vwaza during October. Dowsett-Lemaire & Dowsett (2006) present an overview of breeding in Malawi based primarily on the higher elevation sites (*e.g.* the Nyika Plateau) where they conducted detailed long-term fieldwork. They write that a "well-marked peak of breeding is observed in insectivorous birds of woodland habitat...often centred around September-November" (p. 62). During our work at Vwaza, insectivorous bird species showed evidence of enlarging gonads, but few species showed evidence of breeding (nesting activity, developed ovaries, or brood patches) in mid-October, before the rains started (table 1).

We encountered no species considered globally threatened, although three species—white-backed vulture *Gyps africanus*, bateleur *Terathopius ecaudatus* and martial eagle *Polemaetus bellicosus*—are Near-threatened (BirdLife International, 2012). White-headed vulture *Trigonoceps occipitalis* (Vulnerable), lappet-faced vulture *Torgos tracheliotos* (Vulnerable), hooded vulture *Necrosyrtes monachus* (Endangered) and grey crowned crane *Balearica regulorum* (Vulnerable) have been recorded at Vwaza (McShane & McShane-Caluzi, 1988; Dowsett-Lemaire & Dowsett, 2006) and are likely to be at least occasional visitors, but we did not record them.

Wattled crane *Bugeranus carunculatus* (Vulnerable) is reported as resident in the Reserve (Dowsett-Lemaire & Dowsett, 2006); however, we judge the vegetation structure at the Vwaza Marsh to currently preclude this possibility and the species is likely no more than a vagrant. The current vegetation structure—the marsh is filled with tall, dense papyrus and reeds, and lacks open water—may be related to a lack of large mammals in the dry season (*e.g.* hippopotamus and elephants). An assessment of the historical status of vegetation in the marsh (possibly through aerial photos) would be of interest.

Table 1. Species with evidence of breeding in Vwaza Marsh Wildlife Reserve in October 2009. *Petronia superciliaris* was the only species where more than a few individuals showed evidence of breeding.

Species	Evidence
<i>Aquila wahlbergi</i>	Nest-building
<i>Aquila spilogaster</i>	Adults at nest
<i>Milvus migrans</i>	Nest-building and incubating
<i>Caprimulgus pectoralis</i>	Enlarged ova
<i>Indicator indicator</i>	Enlarged ova
<i>Tchagra senegalus</i>	Enlarged ova
<i>Coracina pectoralis</i>	Enlarged ova
<i>Oriolus auratus</i>	Enlarged ova
<i>Anthoscopus caroli</i>	Enlarged testes
<i>Pycnonotus barbatus</i>	Enlarged ova
<i>Turdus libonyanus</i>	Enlarged ova
<i>Thamnolaea cinnamomeiventris</i>	Enlarged testes
<i>Muscicapa caerulescens</i>	Enlarged testes
<i>Petronia superciliaris</i>	Enlarged ova

The Reserve is Malawi's lone stronghold for several locally distributed species. Vwaza is Malawi's only locality with babbling starling *Neocichla gutturalis*—the range of which extends into Tanzania; it also marks the eastern edge of the range of chestnut-backed sparrow weaver *Plocepasser rufoscapulatus*, which has recently been found in south-western Tanzania (S. Norman in *Bulletin African Bird Club* 9: 150). Both species were common in open miombo woodland around camp. The rocky hills in the north-east of the Reserve, near Kawiya Gate, host species typical of that habitat, including mocking cliff-chat *Thamnolaea cinnamomeiventris*, striped pipit *Anthus lineiventris* and red-winged starling *Onychognathus morio*, all of which have broad, if somewhat patchy, distributions across southern and eastern Africa.

The Reserve is particularly important for its protection of miombo woodland. The quality of these woodlands compared to those outside the Reserve is readily apparent from satellite imagery of the region (*e.g.* Google Earth). This includes areas inside the Reserve that had human settlements that were moved when the Reserve was created in the 1977 (Reserve personnel, pers. comm.). Clearing of miombo woodland in the Nyika Plateau foothills surrounding the Reserve continues. Many species confined to this south-central African habitat were found to be numerous, including Böhm's flycatcher *Muscicapa boehmi*, miombo tit *Parus griseiventris* and miombo scrub robin *Cercotrichas barbata*. Certain restricted-range miombo species such as olive-headed weaver *Ploceus olivaceiceps* and Stierling's woodpecker *Dendropicops stierlingi*, which occur at sites to the south (*e.g.* Dzalanyama Forest Reserve) and in western Tanzania, are not known to occur in Vwaza (see appendix).

#### Details of notable species

##### Red-chested flufftail *Sarothrura rufa*

A female mist-netted and collected in Vwaza Marsh proper on 17 October 2009 was the only flufftail encountered. This bird had granular ovaries measuring 8x5 mm and was not moulting. Based on a survey of the literature, Taylor (1998) considered this species to be

sedentary throughout its range, and Dowsett-Lemaire & Dowsett (2006) considered it sedentary in Malawi.

**African Broadbill** *Smithornis capensis*

A single individual was seen in riverine vegetation in the hills near Kawiya by JMB on 14 October 2009.

**African pitta** *Pitta angolensis*

A male with testes measuring 5x3 mm was collected on 22 November 2009. This bird and another were found in dense tangles in a narrow dry riverbed at the palm grove. African pitta is considered to be a migrant in western Tanzania (<http://tanzaniabirdatlas.com/maps/distribution-maps/598.pdf/view?searchterm=african%20pitta>), but the habitat appears appropriate for breeding. This and other similar gullies in Vwaza could represent breeding areas for this species, which is thought to be declining in Malawi (Dowsett-Lemaire & Dowsett, 2006). Although the species was not known from the Reserve, it was recorded and suspected of breeding at nearby Njakwa Gorge in 1986 (Dowsett-Lemaire & Dowsett, 2006). This species is likely a wet-season breeder in the Reserve, spending the non-breeding season north of the equator (Keith *et al.*, 1992).

**Broad-billed roller** *Eurystomus glaucurus*

Of two specimens collected, one was the intra-African migrant *E. g. suahelicus* and the other was the migrant Madagascar-breeding taxon *E. g. glaucurus*. Nominate *glaucurus* is larger, has a bigger bill, is darker, with less iridescent purple on the underparts and darker rufous on the upperparts. These subspecific characters were confirmed by comparison to material in the Field Museum's collections. Divergence of mitochondrial DNA sequences of the ND3 gene for these individuals is 4.5% (Genbank numbers KC539926 and KC539927) and is thus consistent with the morphological assessment of these specimens. These are the first such sequences for either taxon.

The *glaucurus* specimen was collected on 15 October 2009, and thus fits into the pattern of previously collected Malawian specimens of the subspecies (Dowsett-Lemaire & Dowsett, 2006). It is a female with granular ovaries measuring 10x8 mm, weighing 178 g and with extreme fat. The *suahelicus* specimen, a male with testes measuring 9x4 mm collected on 8 October 2009, weighed 115 g and had but a trace of fat.

**Marsh tchagra** *Tchagra minutus*

A male with light body moult and testes measuring 4x3 mm collected on 9 October 2009 in grasslands adjacent to Vwaza Marsh was the only individual encountered. This is typical habitat for this widespread, but patchily distributed, species.

**African Reed Warbler** *Acrocephalus baeticatus*

Four males and one female of the resident *cinnamomeus* subspecies were mist-netted and collected in Vwaza Marsh. The specimens are distinguishable from migrant Eurasian Reed Warbler *A. scirpaceus* and Marsh Warbler *A. palustris* by their darker, rustier plumage and shorter wings. The birds were not in breeding condition and showed no sign of moult.

**Dark-capped yellow warbler** *Chloropeta natalensis*

One individual was seen by JIE, JMB and JDW, and recorded by JDW (XC96993, [www.xeno-canto.org](http://www.xeno-canto.org)) on 8 October 2009 in woodland and rank grassland along the edge of

Vwaza Marsh. A female undergoing body and wing moult, and with ovaries measuring 3x2 mm, was collected from similar habitat on 13 October 2009.

## DISCUSSION

Given the broad conversion of habitat across Malawi and throughout much of adjacent Zambia and nearby Tanzania, there is no question that Vwaza Marsh Wildlife Reserve is a protected area of great conservation value. Miombo woodland, in particular, is being degraded and lost at a rapid rate. Thus, the mature miombo woodland that covers much of the northern section of the Reserve is of particular importance. Despite permitted human activities, the South Rukuru River, Lake Kazuni and the South Rukuru's floodplain are critical habitat for waterbirds (as well as for large mammals). Vwaza's status as an Important Bird Area (Dowsett-Lemaire *et al.*, 2001) is well deserved.

Our work focused on areas of the Reserve that have received little attention in the past from ornithologists and birders, so we recorded a large number of new quadrat records and six new bird species for the Reserve. The new records for Vwaza were not unexpected species, given that there is appropriate habitat and all of the species are known from nearby localities.

There is still much to be learned about Vwaza's birdlife. Particularly interesting would be a wet-season inventory of Vwaza Marsh itself, when the surrounding grasslands become flooded. The habitat appeared well suited for a variety of birds unrecorded in that pentad, including rallids (*e.g.* streaky-breasted flufftail *Sarothrura boehmi*, striped crake *Aenigmatolimnas marginalis* and African crake *Crex egregia*), and *Acrocephalus* warblers (*e.g.* sedge warbler *A. schoenabaenus* and lesser swamp-warbler *A. gracilirostris*). Our dry-season visit added two rails and one *Acrocephalus* to the pentad, but there are other species that likely occur there.

From a management standpoint, another valuable study would be an assessment of impacts that the localized movements of large mammals have on the Reserve's wetland habitats. The concentration and activity year-round of large mammals along the South Rukuru River have essentially removed all vegetation from the banks of the river. As a result, bird species relying on bank-line vegetation (*e.g.* rufous-bellied heron *Ardeola rufiventris*, long-toed plover *Vanellus crassirostris* and various rails) are unlikely to be found there today as they may have been in the past (*e.g.* *C. egregia*, Benson, 1940b; *V. crassirostris*, Dowsett-Lemaire & Dowsett, 2006). Indeed, although African finfoot *Podica senegalensis* has been recorded in Vwaza Marsh Wildlife Reserve (Dowsett-Lemaire & Dowsett, 2006), no suitable habitat appears to exist currently. Restoration of riverbank vegetation would benefit a variety of bird (and non-bird) species.

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## REFERENCES

- Benson, C.W. (1937). Miscellaneous notes on Nyasaland birds. *The Ibis* **14**: 551-582.
- Benson, C.W. (1940a). Further notes on Nyasaland birds (with particular reference to those of the northern province) – Part I. *The Ibis* **14**: 257-298.
- Benson, C.W. (1940b). Further notes on Nyasaland birds (with particular reference to those of the northern province) – Part II. *The Ibis* **14**: 387-433.
- Benson, C.W. (1940c). Further notes on Nyasaland birds (with particular reference to those of the northern province) – Part III. *The Ibis* **14**: 583-629.
- Benson, C.W. (1941). Further notes on Nyasaland birds (with particular reference to those of the northern province) – Part IV. *The Ibis* **15**: 1-55.
- Bird Committee, Nature Kenya (2009). *Checklist of the Birds of Kenya*. Fourth Edition. East Africa Natural History Society Bird Committee, Nairobi.
- BirdLife International (2012). Data Zone. [www.birdlife.org](http://www.birdlife.org) [accessed 5 June 2012].
- Dowsett-Lemaire, F. (2006). Notes supplementary to *The Birds of Malawi* (2006). *Tauraco Research Report* **8**: 65-121.
- Dowsett-Lemaire, F. & R.J. Dowsett (2006). *The Birds of Malawi*. Tauraco Press & Aves, Liège, Belgium.
- Dowsett-Lemaire, F., R.J. Dowsett & M. Dyer (2001). Malawi. In L.D.C. Fishpool & M.I. Evans (eds.), *Important Bird Areas in Africa and Associated Islands*. Pisces Publications and BirdLife International, Newbury & Cambridge. Pp. 539-555.
- Gill, F. & D. Donsker (eds.) (2010). IOC World Bird Names (version 2.3). <http://www.worldbirdnames.org/> [accessed on 17 February 2010].
- Keith, S., E.K. Urban & C.H. Fry (eds.) (1992). *The Birds of Africa*. Vol. 4. Academic Press, San Diego.
- McShane, T.O. & E. McShane-Caluzi (1988). The habitats, birds and mammals of Vwaza Marsh Game Reserve, Malawi. *Nyala* **12**: 39-66.
- Mepham, R., R.H. Hughes & J.S. Hughes (1992). *Directory of African Wetlands*. <http://ramsar.wetlands.org/ADirectoryofAfricaWetlands/tabid/824/language/en-US/Default.aspx>. [accessed on 9 February 2010].
- Taylor, B. (1998). *Rails of the World*. Yale University Press, New Haven, Connecticut.



## APPENDIX

List of all species recorded in Vwaza Marsh Wildlife Reserve in the published literature. Localities are listed for our records. Locality codes: a=camp, including Vwaza Marsh (quadrat 1033C4); b=Lake Kazuni and the South Rukuru River Floodplain (1133B1), including Zaro Pool (1133A2); c=palm grove (1133B1); d=hills near Kawiya Gate (1033D3). See text for coordinates and site descriptions. Quadrat numbers are listed next to the species that are new records for those locations. An asterisk (\*) indicates that voucher specimens were collected. Records were compiled from Benson (1937, 1940a, 1940b, 1940c, 1941), Dowsette-Lemaire (2006), Dowsette-Lemaire & Dowsett (2006), and McShane & McShane-Caluzi (1988). For records from Benson's publications, those listed as "near Lake Kasuni" are included, although we cannot be sure that they were recorded within the current limits of the Reserve. Species with common names in SMALL CAPS are those that have records in Dowsette-Lemaire & Dowsett (2006) in quadrats that include Vwaza and are likely to occur there, but for which we could not find published records from the Reserve.

Name	Locality	Quadrat
Helmeted guineafowl <i>Numida meleagris</i> (Linnaeus, 1758)	*a,b,c	
Coqui francolin <i>Francolinus coqui</i> (A. Smith, 1836) <sup>6,7</sup>		
SHELLEY'S FRANCOLIN <i>Francolinus shelleyi</i> (Ogilvie-Grant, 1890)		
HILDEBRANDT'S FRANCOLIN <i>Francolinus hildebrandti</i> (Cabanis, 1878)		
Red-necked spurfowl <i>Francolinus afer</i> (Statius Müller, 1776)	a,b	
Swainson's francolin <i>Francolinus swainsoni</i> (A. Smith, 1836) <sup>6</sup>		
Common quail <i>Coturnix coturnix</i> (Linnaeus, 1758) <sup>1</sup>		
HARLEQUIN QUAIL <i>Coturnix delegorguei</i> Delagorgue, 1847		
White-faced whistling duck <i>Dendrocygna viduata</i> (Linnaeus, 1766)	b	
Fulvous whistling duck <i>Dendrocygna bicolor</i> (Vieillot, 1816) <sup>6</sup>		
White-backed duck <i>Thalassornis leuconotus</i> Eyton, 1838 <sup>6,7</sup>		
Spur-winged goose <i>Plectropterus gambensis</i> (Linnaeus, 1766)	b	
Knob-billed duck <i>Sarkidiornis melanotos</i> (Pennant, 1769)	*b	
Egyptian goose <i>Alopochen aegyptiaca</i> (Linnaeus, 1766)	*b	
African pygmy goose <i>Nettapus auritus</i> (Boddaert, 1783) <sup>5</sup>		
Yellow-billed duck <i>Anas undulata</i> C.F. Dubois, 1839	b	
Red-billed teal <i>Anas erythrorhyncha</i> Gmelin, 1789	b	
GARGANEY <i>Anas querquedula</i> Linnaeus, 1758		
Hottentot teal <i>Anas hottentota</i> (Eyton, 1838) <sup>6</sup>		
Southern pochard <i>Netta erythrophthalma</i> (zu Wied, 1832) <sup>6,7</sup>		
Little grebe <i>Tachybaptus ruficollis</i> (Pallas, 1764) <sup>6,7</sup>		
GREATER FLAMINGO <i>Phoenicopterus roseus</i> Linnaeus, 1758		
Yellow-billed stork <i>Mycteria ibis</i> (Linnaeus, 1766)	b	
African open-billed stork <i>Anastomus lamelligerus</i> Temminck, 1823	b	
Black stork <i>Ciconia nigra</i> (Linnaeus, 1758)	b	
Abdim's stork <i>Ciconia abdimii</i> Lichtenstein, 1823 <sup>6</sup>		
Wooly-necked stork <i>Ciconia episcopus</i> (Boddaert, 1783) <sup>6</sup>		
White stork <i>Ciconia ciconia</i> (Linnaeus, 1758) <sup>6</sup>		
Saddle-billed stork <i>Ephippiorhynchus senegalensis</i> (Shaw, 1800) <sup>6</sup>		
Marabou stork <i>Leptoptilos crumeniferus</i> (Lesson, 1831) <sup>6</sup>		
Sacred ibis <i>Threskiornis aethiopicus</i> (Latham, 1790)	b	
Hadada ibis <i>Bostrychia hagedash</i> (Latham, 1790)	b	

Name	Locality	Quadrat
Glossy ibis <i>Plegadis falcinellus</i> (Linnaeus, 1766) <sup>6</sup>		
African spoonbill <i>Platalea alba</i> Scopoli, 1786	a	
LITTLE BITTERN <i>Ixobrychus minutus</i> (Linnaeus, 1766)		
Black-crowned night-heron <i>Nycticorax nycticorax</i> (Linnaeus, 1758) <sup>6,7</sup>		
Green heron <i>Butorides striata</i> (Linnaeus, 1758) <sup>6</sup>		
Squacco heron <i>Ardeola ralloides</i> (Scopoli, 1769) <sup>6,7</sup>		
Rufous-bellied heron <i>Ardola rufiventris</i> (Sundevall, 1851) <sup>6</sup>		
Cattle egret <i>Bubulcus ibis</i> (Linnaeus, 1758)	b	
Grey heron <i>Ardea cinerea</i> Linnaeus, 1758	b	
Black-headed heron <i>Ardea melanocephala</i> Vigors & Children, 1826 <sup>1,7</sup>		
Goliath heron <i>Ardea goliath</i> Cretzschmar, 1829 <sup>6,7</sup>		
Intermediate egret <i>Egretta intermedia</i> (Wagler, 1829) <sup>6</sup>		
Great white egret <i>Ardea alba</i> Linnaeus, 1758	b	
Black heron <i>Egretta ardesiaca</i> (Wagler, 1827) <sup>6</sup>		
Little egret <i>Egretta garzetta</i> (Linnaeus, 1766) <sup>6</sup>		
Hamerkop <i>Scopus umbretta</i> J.F. Gmelin, 1789	b	
Great white pelican <i>Pelecanus onocrotalus</i> Linnaeus, 1758 <sup>6</sup>	b	
Reed cormorant <i>Phalacrocorax africanus</i> (J.F.Gmelin, 1789) <sup>6,7</sup>		
Great cormorant <i>Phalacrocorax carbo</i> (Linnaeus 1758) <sup>6</sup>		
African darter <i>Anhinga rufa</i> (Daudin, 1802) <sup>6</sup>		
LESSER KESTREL <i>Falco naumanni</i> Fleischer, 1817		
Dickinson's kestrel <i>Falco dickinsoni</i> P.L.Sclater, 1864 <sup>6</sup>		
Red-necked falcon <i>Falco chiquera</i> Daudin, 1800 <sup>6</sup>		
RED-FOOTED FALCON <i>Falco vespertinus</i> Linnaeus 1766		
Amur falcon <i>Falco amurensis</i> Radde, 1863 <sup>6</sup>	b	1133B1
Eurasian hobby <i>Falco subbuteo</i> Linnaeus, 1758 <sup>6</sup>		
Lanner falcon <i>Falco biarmicus</i> Temminch, 1825 <sup>7</sup>		
Peregrine falcon <i>Falco peregrinus</i> Tunstall, 1771	a	1033C4
OSPREY <i>Pandion haliaetus</i> (Linnaeus, 1758)		
European honey buzzard <i>Pernis apivorus</i> (Linnaeus, 1758)	b	1133A2
BAT HAWK <i>Macheiramphus alcinus</i> Bonaparte, 1850		
African black-shouldered kite <i>Elanus caeruleus</i> (Desfontaines, 1789)	a	
Black kite <i>Milvus migrans</i> (Boddaert, 1783) <sup>2</sup>	*a,b	1133A2
African fish eagle <i>Haliaeetus vocifer</i> (Daudin, 1800)	b	
Palm-nut vulture <i>Gypohierax angolensis</i> (J.F.Gmelin, 1788) <sup>6</sup>		
Hooded vulture <i>Necrosyrtes monachus</i> (Temminck, 1823) <sup>6</sup>		
White-backed vulture <i>Gyps africanus</i> Salvadori, 1865	a	
White-headed vulture <i>Trigonoceps occipitalis</i> (Burchell, 1824) <sup>6</sup>		
Lappet-faced vulture <i>Torgos tracheliotus</i> (Forster, 1791) <sup>6</sup>		
Black-chested snake eagle <i>Circaetus pectoralis</i> A.Smith, 1829 <sup>6</sup>		
Brown snake eagle <i>Circaetus cinereus</i> Vieillot, 1818 <sup>6</sup>		
Western banded snake eagle <i>Circaetus cinerascens</i> von Müller, 1851 <sup>6</sup>		
Bateleur <i>Terathopius ecaudatus</i> (Daudin, 1800) <sup>6</sup>		
Western marsh harrier <i>Circus aeruginosus</i> (Linnaeus, 1758) <sup>6</sup>		
African marsh harrier <i>Circus ranivorus</i> (Daudin, 1800)	a	

Name	Locality	Quadrat
Montagu's harrier <i>Circus pygargus</i> (Linnaeus, 1758) <sup>6</sup>		
African harrier hawk <i>Polyboroides typus</i> A. Smith, 1829	a	
Dark chanting-goshawk <i>Melierax metabates</i> Heuglin, 1861	a	
Gabar goshawk <i>Micronisus gabar</i> (Daudin, 1800)	a	1033C4
African goshawk <i>Accipiter tachiro</i> (Daudin, 1800)	a	1033C4
Shikra <i>Accipiter badius</i> (J.F. Gmelin, 1788)	a	
Little sparrowhawk <i>Accipiter minullus</i> (Daudin, 1800) <sup>6</sup>		
Ovambo sparrowhawk <i>Accipiter ovampensis</i> Gurney, 1875 <sup>6</sup>		
Great sparrowhawk <i>Accipiter melanoleucus</i> A. Smith, 1830	a	
Lizard buzzard <i>Kaupifalco monogrammicus</i> (Temminck, 1824) <sup>6</sup>		
Common buzzard <i>Buteo buteo</i> (Linnaeus, 1758)	a,b	1033C4, 1133B1
Augur buzzard <i>Buteo augur</i> (Rüppell, 1836) <sup>6</sup>		
Lesser spotted eagle <i>Aquila pomarina</i> C.L. Brehm, 1831	a	1033C4
Tawny eagle <i>Aquila rapax</i> Lesson, 1830 <sup>6</sup>		
STEPPE EAGLE <i>Aquila nipalensis</i> Hodgson, 1833		
Verreaux's eagle <i>Aquila verreauxii</i> Lesson, 1830 <sup>6</sup>		
Wahlberg's eagle <i>Aquila wahlbergi</i> (Sundevall, 1850)	*a,b	
African hawk eagle <i>Aquila spilogaster</i> (Bonaparte, 1850)	c	
Booted eagle <i>Aquila pennata</i> (Gmelin, 1788)	a	1033C4
Martial eagle <i>Polemaetus bellicosus</i> (Daudin, 1800)	a,d	
Long-crested eagle <i>Lophaetus occipitalis</i> (Daudin, 1800)	a	
Crowned eagle <i>Stephanoaetus coronatus</i> (Linnaeus, 1766)	a	
Black-bellied bustard <i>Lissotis melanogaster</i> (Rüppell, 1835) <sup>6</sup>		
Red-chested flufftail <i>Sarothrura rufa</i> (Vieillot, 1819)	*a	1033C4
African water rail <i>Rallus caerulescens</i> Gmelin, 1789	a	1033C4
African crane <i>Crex egregia</i> (Peters, 1854) <sup>8</sup>		
Black crane <i>Amauornis flavirostra</i> (Swainson, 1837) <sup>6,8</sup>		
Common moorhen <i>Gallinula chloropus</i> (Linnaeus, 1758) <sup>8</sup>		
Red-knobbed coot <i>Fulica cristata</i> J.F. Gmelin, 1789 <sup>8</sup>		
African finfoot <i>Podica senegalensis</i> (Vieillot, 1817) <sup>6</sup>		
Grey crowned crane <i>Balearica regulorum</i> (Bennett, 1834) <sup>6</sup>		
Wattled crane <i>Bugeranus carunculatus</i> (J.F. Gmelin, 1789) <sup>6,8</sup>		
Common buttonquail <i>Turnix sylvaticus</i> (Desfontaines, 1787) <sup>6</sup>		
Water thick-knee <i>Burhinus vermiculatus</i> (Cabanis, 1868)	b	1133B1
Spotted thick-knee <i>Burhinus capensis</i> (Lichtenstein, 1823) <sup>6</sup>		
Black-winged stilt <i>Himantopus himantopus</i> (Linnaeus, 1758) <sup>6</sup>		
PIED AVOCET <i>Recurvirostra avosetta</i> Linnaeus, 1758		
Long-toed plover <i>Vanellus crassirostris</i> (Hartlaub, 1855) <sup>6</sup>		
Blacksmith plover <i>Vanellus armatus</i> (Burchell, 1822)	b	
White-crowned plover <i>Vanellus albiceps</i> Gould, 1834 <sup>11</sup>		
Senegal plover <i>Vanellus lugubris</i> (Lesson, 1826) <sup>6</sup>		
African wattled plover <i>Vanellus senegallus</i> (Linnaeus, 1766)	a,b	
Grey plover <i>Pluvialis squatarola</i> (Linnaeus 1758) <sup>6</sup>		
Common ringed plover <i>Charadrius hiaticula</i> Linnaeus, 1758 <sup>6</sup>		

Name	Locality	Quadrat
Kittlitz's plover <i>Charadrius pecuarius</i> Temminck, 1823	*b	
Three-banded plover <i>Charadrius tricollaris</i> Vieillot, 1818	*b	
Greater painted-snipe <i>Rostrahula benghalensis</i> (Linnaeus, 1758) <sup>11</sup>		
LESSER JACANA <i>Microparra capensis</i> (A. Smith, 1839)		
African jacana <i>Actophilornis africanus</i> (Gmelin, 1789)	b	
African snipe <i>Gallinago nigripennis</i> Bonaparte, 1839 <sup>6</sup>		
Marsh sandpiper <i>Tringa stagnatilis</i> (Bechstein, 1803) <sup>6</sup>		
Common greenshank <i>Tringa nebularia</i> (Gunnerus, 1767)	b	
GREEN SANDPIPER <i>Tringa ochropus</i> Linnaeus, 1758		
Wood sandpiper <i>Tringa glareola</i> Linnaeus, 1758	b	
Common sandpiper <i>Actitis hypoleucos</i> (Linnaeus, 1758)	b	
Ruddy turnstone <i>Arenaria interpres</i> (Linnaeus, 1758) <sup>11</sup>		
Little stint <i>Calidris minuta</i> (Leisler, 1812)	*b	
CURLEW SANDPIPER <i>Calidris ferruginea</i> (Pontoppidan, 1763)		
Ruff <i>Philomachus pugnax</i> (Linnaeus, 1758)	b	1133A2
Temminck's courser <i>Cursorius temminckii</i> Swainson, 1822 <sup>6</sup>		
Bronze-winged courser <i>Rhinoptilus chalcopterus</i> (Temminck, 1824) <sup>6</sup>		
Collared pratincole <i>Glareola pratincola</i> (Linnaeus, 1766)	*b	
Rock pratincole <i>Glareola nuchalis</i> G.R. Gray, 1849 <sup>12</sup>		
Grey-headed gull <i>Chroicocephalus cirrocephalus</i> (Vieillot, 1818) <sup>6,8</sup>		
Whiskered tern <i>Chlidonias hybrida</i> (Pallas, 1811)	b	
White-winged black tern <i>Chlidonias leucopterus</i> (Temminck, 1815) <sup>6,8</sup>		
African skimmer <i>Rynchops flavirostris</i> Vieillot, 1816 <sup>6</sup>		
AFRICAN MOURNING DOVE <i>Streptopelia decipiens</i> (Hartlaub & Finsch, 1870)		
Red-eyed dove <i>Streptopelia semitorquata</i> (Rüppell, 1837)	a,b	
Ring-necked dove <i>Streptopelia capicola</i> (Sundevall, 1857)	*a,b	
Laughing dove <i>Streptopelia senegalensis</i> (Linnaeus, 1766)	a,b	
Emerald-spotted wood-dove <i>Turtur chalcospilos</i> (Wagler, 1827)	*a,b	
Namaqua dove <i>Oena capensis</i> (Linnaeus, 1766) <sup>6</sup>		
African green-pigeon <i>Treron calvus</i> (Temminck, 1811)	*a	
Brown-necked parrot <i>Poicephalus fuscicollis</i> (J.F. Gmelin, 1788) <sup>6</sup>		
Meyer's parrot <i>Poicephalus meyeri</i> (Cretzschmar, 1827)	*a,b,c	
Schalow's turaco <i>Tauraco schalowi</i> (Reichenow, 1891) <sup>6</sup>		
Purple-crested turaco <i>Tauraco porphyreolophus</i> (Vigors, 1831)	*a,c,d	
Grey go-away-bird <i>Corythaixoides concolor</i> (A. Smith, 1833)	*a	
Jacobin cuckoo <i>Clamator jacobinus</i> (Boddaert, 1783) <sup>6</sup>		
Levaillant's cuckoo <i>Clamator levaillantii</i> (Swainson, 1829) <sup>6,8</sup>		
GREAT SPOTTED CUCKOO <i>Clamator glandarius</i> (Linnaeus, 1758)		
Thick-billed cuckoo <i>Pachycoccyx audeberti</i> (Schlegel, 1879)	a	
Red-chested cuckoo <i>Cuculus solitarius</i> Stephens, 1815	a,b,d	
Black cuckoo <i>Cuculus clamosus</i> Latham, 1801 <sup>6</sup>		
Common cuckoo <i>Cuculus canorus</i> Linnaeus, 1758 <sup>6</sup>		
African cuckoo <i>Cuculus gularis</i> Stephens, 1815	*a	
Klaas's cuckoo <i>Chrysococcyx klaas</i> (Stephens, 1815)	*a	
AFRICAN EMERALD CUCKOO <i>Chrysococcyx cupreus</i> (Shaw, 1792)		

Name	Locality	Quadrat
Diederik cuckoo <i>Chrysococcyx caprius</i> (Boddaert, 1783) <sup>6</sup>		
Yellowbill <i>Ceuthmochares aereus</i> Sharpe, 1873 <sup>12</sup>		
Black coucal <i>Centropus grillii</i> Hartlaub, 1861 <sup>6,8</sup>		
Senegal coucal <i>Centropus senegalensis</i> (Linnaeus, 1766)	a	
White-browed coucal <i>Centropus superciliosus</i> Hemprich & Ehrenberg, 1828	*a,b	
Barn owl <i>Tyto alba</i> (Scopoli, 1769) <sup>3</sup>	a	1033C4
African scops-owl <i>Otus senegalensis</i> (Swainson, 1837) <sup>3</sup>	a	
Southern white-faced scops owl <i>Ptilopsis granti</i> (Kollibay, 1910) <sup>11</sup>		
Spotted eagle-owl <i>Bubo africanus</i> (Temminck, 1821)	a	
Verreaux's eagle owl <i>Bubo lacteus</i> (Temminck, 1820) <sup>6,8</sup>		
PEL'S FISHING OWL <i>Scotopelia peli</i> (Bonaparte, 1850)		
AFRICAN WOOD OWL <i>Strix woodfordii</i> (A. Smith, 1834)		
Pearl-spotted owlet <i>Glaucidium perlatum</i> (Vieillot, 1817)	*a,d	1033C4
African barred owlet <i>Glaucidium capense</i> (A. Smith, 1834)	d	1033D3
Marsh owl <i>Asio capensis</i> (A. Smith, 1834) <sup>6</sup>		
Fiery-necked nightjar <i>Caprimulgus pectoralis</i> Cuvier, 1816	*a	
FRECKLED NIGHTJAR <i>Caprimulgus tristigma</i> Rüppel, 1840		
Gabon nightjar <i>Caprimulgus fossii</i> Hartlaub, 1857	*a	
Pennant-winged nightjar <i>Macrodipteryx vexillarius</i> (Gould, 1838) <sup>6</sup>		
African palm-swift <i>Cypsiurus parvus</i> (Lichtenstein, 1823)	a,b,c,d	
Common swift <i>Apus apus</i> (Linnaeus, 1758)	b	
White-rumped swift <i>Apus caffer</i> (Lichtenstein, 1823) <sup>11</sup>		
Speckled moosebird <i>Colius striatus</i> Gmelin, 1789	*a	1033C4
Narina trogon <i>Apaloderma narina</i> (Stephens, 1815) <sup>8</sup>		
RUFIOUS-CROWNED ROLLER <i>Coracias naevius</i> Daudin, 1800		
Lilac-breasted roller <i>Coracias caudatus</i> Linnaeus, 1766	b	
Racket-tailed roller <i>Coracias spatulatus</i> Trimen, 1880	d	
EURASIAN ROLLER <i>Coracias garrulous</i> Linnaeus, 1758		
Broad-billed roller <i>Eurystomus glaucurus</i> (Statius Müller, 1776)	*a,b,c	
Grey-headed kingfisher <i>Halcyon leucocephala</i> (Statius Müller, 1776)	a	
Brown-hooded kingfisher <i>Halcyon albiventris</i> (Scopoli, 1786)	*b,c	
Striped kingfisher <i>Halcyon chelicuti</i> (Stanley, 1814)	d	1033D3
Woodland kingfisher <i>Halcyon senegalensis</i> (Linnaeus, 1766)	a	
African pygmy-kingfisher <i>Ceyx pictus</i> (Boddaert, 1783)	*a	1033C4
Malachite kingfisher <i>Alcedo cristata</i> Pallas, 1764	*a	
Semi-collared kingfisher <i>Alcedo semitorquata</i> Swainson, 1823 <sup>6</sup>		
Giant kingfisher <i>Megaceryle maxima</i> (Pallas, 1769) <sup>6</sup>		
Pied kingfisher <i>Ceryle rudis</i> (Linnaeus, 1758)	b	
Swallow-tailed bee-eater <i>Merops hirundineus</i> A.A.H. Lichtenstein, 1793	d	
Little bee-eater <i>Merops pusillus</i> Statius Müller, 1776	*a,c,d	
White-fronted bee-eater <i>Merops bullockoides</i> Smith, 1834 <sup>6,8</sup>		
Madagascar bee-eater <i>Merops superciliosus</i> Linnaeus, 1766 <sup>6</sup>		
Eurasian bee-eater <i>Merops apiaster</i> Linnaeus, 1758	*a,b,d	
Southern carmine bee-eater <i>Merops nubicoides</i> Des Murs & Pucheran, 1846 <sup>6</sup>		

Name	Locality	Quadrat
Hoopoe <i>Upupa epops</i> Linnaeus, 1758	a	
Green wood-hoopoe <i>Phoeniculus purpureus</i> (J.F. Miller, 1784)	a,b,c,d	
Common scimitar-bill <i>Rhinopomastus cyanomelas</i> (Vieillot, 1819)	a	
Crowned hornbill <i>Tockus alboterminatus</i> (Büttikofer, 1889) <sup>6</sup>		
Pale-billed hornbill <i>Tockus pallidirostris</i> (Hartlaub & Finsch, 1870)	a	1033C4
African grey hornbill <i>Tockus nasutus</i> (Linnaeus, 1766)	*a,b	
Red-billed hornbill <i>Tockus erythrorhynchus</i> (Temminck, 1823)	b,c	
Trumpeter hornbill <i>Bycanistes bucinator</i> (Temminck, 1824)	a,d	1033C4
Southern ground hornbill <i>Bucorvus leadbeateri</i> (Vigors, 1825)	a	
Yellow-fronted tinkerbird <i>Pogoniulus chrysoconus</i> (Temminck, 1832)	a,c,d	
Miombo pied barbet <i>Tricholaema frontata</i> (Cabanis, 1880) <sup>6</sup>		
Black-collared barbet <i>Lybius torquatus</i> (Dumont, 1816) <sup>6</sup>	*a,b,c,d	
Crested barbet <i>Trachyphonus vaillantii</i> Ranzani, 1821	*a,d	
GREEN-BACKED HONEYBIRD <i>Prodotiscus zambesiae</i> Shelley, 1894		
BROWN-BACKED HONEYBIRD <i>Prodotiscus regulus</i> Sundevall, 1850		
Lesser honeyguide <i>Indicator minor</i> Stephens, 1815	*a,c	
SCALY-THROATED HONEYGUIDE <i>Indicator variegatus</i> Lesson, 1830		
Greater honeyguide <i>Indicator indicator</i> (Sparrman, 1777)	*a	
Golden-tailed woodpecker <i>Campethera abingoni</i> (A. Smith, 1836)	*a,c,d	
Green-backed woodpecker <i>Campethera cailliautii</i> (Malherbe, 1849) <sup>6</sup>		
Bennett's woodpecker <i>Campethera bennetti</i> (A. Smith, 1836)	*a	1033C4
Cardinal woodpecker <i>Dendropicos fuscescens</i> (Vieillot, 1818)	*a,c	
Bearded woodpecker <i>Dendropicos namaquus</i> (A.A.H. Lichtenstein, 1793)	a	
African broadbill <i>Smithornis capensis</i> (A. Smith, 1839)	d	
African pitta <i>Pitta angolensis</i> Vieillot, 1816	*c	1133B1
Chin-spot batis <i>Batis molitor</i> (Küster, 1836)	*a,b,c,d	
White-crested helmetshrike <i>Prionops plumatus</i> (Shaw, 1809)	*a,b,c,d	
Retz's helmetshrike <i>Prionops retzii</i> Wahlberg, 1856	*a,b,c,d	
Grey-headed bushshrike <i>Malaconotus blanchoti</i> Stephens, 1826	*a,b,c,d	1133B1
Sulphur-breasted bushshrike <i>Chlorophoneus sulfureopectus</i> (Lesson, 1831)	*a,b,c,d	
Marsh tchagra <i>Tchagra minutus</i> (Hartlaub, 1858)	*a	1033C4
Brown-crowned tchagra <i>Tchagra australis</i> (A. Smith, 1836)	*a,c	
Black-crowned tchagra <i>Tchagra senegalus</i> (Linnaeus, 1766)	*a,b,c,d	
Black-backed puffback <i>Dryoscopus cubla</i> (Latham, 1802)	*a,b,c,d	
Tropical boubou <i>Laniarius aethiopicus</i> (J.F. Gmelin, 1789)	*a,b,c,d	
Brubru <i>Nilaus afer</i> (Latham, 1802)	*a	
White-breasted cuckooshrike <i>Coracina pectoralis</i> (Jardine & Selby, 1828)	*a,d	
Black cuckooshrike <i>Campephaga flava</i> Vieillot, 1817	d	
Souza's shrike <i>Lanius souzae</i> Barboza du Bocage, 1878 <sup>6</sup>		
Red-backed shrike <i>Lanius collurio</i> Linnaeus, 1758	b	
LESSER GREY SHRIKE <i>Lanius meridionalis</i> Gmelin, 1788		
Common fiscal <i>Lanius collaris</i> Linnaeus, 1766	*a	
EURASIAN GOLDEN ORIOLE <i>Oriolus oriolus</i> (Linnaeus, 1758)		
African golden oriole <i>Oriolus auratus</i> Vieillot, 1817	*a	
Black-headed oriole <i>Oriolus larvatus</i> Lichtenstein, 1823	*a,c,d	

Name	Locality	Quadrat
Common drongo <i>Dicrurus adsimilis</i> (Bechstein, 1794)	*a,b,c,d	
African paradise flycatcher <i>Terpsiphone viridis</i> (Statius Müller, 1776)	*a,b,c,d	
Pied crow <i>Corvus albus</i> Statius Müller, 1776	a	1033C4
White-necked raven <i>Corvus albicollis</i> Latham, 1790 <sup>6</sup>		
White-winged black tit <i>Parus leucomelas</i> (Rüppel, 1840) <sup>6</sup>		
Southern black tit <i>Parus niger</i> (Vieillot, 1818)	*a,b,c,d	
Rufous-bellied tit <i>Parus rufiventris</i> (Bocage, 1877)	*a,d	
Miombo tit <i>Parus griseiventris</i> Reichenow, 1882	a,d	
Grey penduline tit <i>Anthoscopus caroli</i> (Sharpe, 1871)	*a,c,d	1133B1
BLACK SAW-WING <i>Psalidoprocne pristoptera</i> (Rüppel, 1840)		
Grey-rumped swallow <i>Pseudohirundo griseopyga</i> (Sundevall, 1850) <sup>6</sup>		
SAND MARTIN <i>Riparia riparia</i> (Linnaeus, 1758)		
Barn swallow <i>Hirundo rustica</i> Linnaeus, 1758	a,b,c,d	
Wire-tailed swallow <i>Hirundo smithii</i> Leach, 1818	b	
Common house martin <i>Delichon urbicum</i> (Linnaeus, 1758)	*a,d	1033C4
Lesser striped swallow <i>Cecropsis abyssinica</i> (Guérin-Méneville, 1843)	d	
Rufous-chested swallow <i>Cecropsis semirufa</i> (Sundevall, 1850) <sup>6</sup>		
Mosque swallow <i>Cecropsis senegalensis</i> (Linnaeus, 1766) <sup>6</sup>		
Flappet lark <i>Mirafra rufocinnamomea</i> (Salvadori, 1865)	*a	
Fischer's sparrow-lark <i>Eremopterix leucopareia</i> (Fischer & Reichenow, 1884)	*b	
Red-faced cisticola <i>Cisticola erythrops</i> (Hartlaub, 1857)	*a,c,d	
SINGING CISTICOLA <i>Cisticola cantans</i> (von Heuglin, 1879)		
Rattling cisticola <i>Cisticola chiniana</i> (A. Smith, 1843)	*a	
Winding cisticola <i>Cisticola galactotes</i> (Temminck, 1821) <sup>6</sup>		
Croaking cisticola <i>Cisticola natalensis</i> (A. Smith, 1843)	*a	
Neddicky <i>Cisticola fulvicapilla</i> (Vieillot, 1817)	*a	
Siffling cisticola <i>Cisticola brachypterus</i> (Sharpe, 1870)	*a	1033C4
ZITTING CISTICOLA <i>Cisticola juncidis</i> (Rafinesque, 1810)		
Tawny-flanked prinia <i>Prinia subflava</i> (J.F. Gmelin, 1789)	*a,b,c	
Red-winged prinia <i>Heliolais erythropterus</i> (Jardine, 1849)	*a	1033C4
Yellow-breasted apalis <i>Apalis flavida</i> (Strickland, 1853)	a	
Grey-backed camaroptera <i>Camaroptera brachyura</i> (Vieillot, 1820)	a,b,c,d	
Pale wren-warbler <i>Calamonastes undosus</i> (Reichenow, 1882)	*a,d	
Common bulbul <i>Pycnonotus barbatus</i> (Desfontaines, 1789)	*a,b,c,d	
Yellow-bellied greenbul <i>Chlorocichla flaviventris</i> (A. Smith, 1834)	c	
Terrestrial brownbul <i>Phyllastrephus terrestris</i> Swainson, 1837	b	
Grey-olive greenbul <i>Phyllastrephus cerviniventris</i> Shelley, 1894	c	1133B1
Fan-tailed grassbird <i>Schoenicola brevirostris</i> (Sundevall, 1850) <sup>6</sup>		
Little rush warbler <i>Bradypterus baboecala</i> (Vieillot, 1817)	*a	1033C4
Moustached grass warbler <i>Melocichla mentalis</i> (Fraser, 1843)	a	1033C4
Sedge warbler <i>Acrocephalus scheonobaenus</i> (Linnaeus, 1758) <sup>9</sup>		
LESSER SWAMP WARBLER <i>Acrocephalus gracilirostris</i> (Hartlaub, 1864)		
GREAT REED WARBLER <i>Acrocephalus arundinaceus</i> (Linnaeus, 1758)		
African reed warbler <i>Acrocephalus baeticatus</i> (Vieillot, 1817)	*a	1033C4

Name	Locality	Quadrat
Icterine warbler <i>Hippolais icterina</i> (Vieillot, 1817) <sup>12</sup>		
Dark-capped yellow warbler <i>Chloropeta natalensis</i> A. Smith, 1847	*a	1033C4
YELLOW-BELLIED HYLIOTA <i>Hyliota flavigaster</i> Swainson, 1837		
Willow warbler <i>Phylloscopus trochilus</i> (Linnaeus, 1758)	*a,b,c,d	
Yellow-bellied eremomela <i>Eremomela icteropygialis</i> (Lafresnaye, 1839)	a	
Green-capped eremomela <i>Eremomela scotops</i> Sundevall, 1850	a	
Long-billed crombec <i>Sylvietta rufescens</i> (Vieillot, 1817)	a	
RED-CAPPED CROMBEC <i>Sylvietta ruficapilla</i> Barboza du Bocage, 1877		
Garden warbler <i>Sylvia borin</i> (Boddaert, 1783)	*a	1033C4
Common whitethroat <i>Sylvia communis</i> Latham, 1787 <sup>6</sup>		
Arrow-marked babbler <i>Turdoides jardineii</i> (A. Smith, 1836)	a,b,d	
African yellow white-eye <i>Zosterops senegalensis</i> Bonaparte, 1850	a	
Spotted creeper <i>Salpornis spilonotus</i> (Franklin, 1831)	*a	
Wattled starling <i>Creatophora cinerea</i> (Meuschen, 1787) <sup>10</sup>		
Greater blue-eared starling <i>Lamprotornis chalybaeus</i> Hemprich & Ehrenberg, 1828	*a,b,c,d	
Lesser blue-eared starling <i>Lamprotornis chloropterus</i> Swainson, 1838	a,d	
Violet-backed starling <i>Cinnyricinclus leucogaster</i> (Boddaert, 1783)	*a,b,c,d	
Red-winged starling <i>Onychognathus morio</i> (Linnaeus, 1766)	d	1033D3
Babbling starling <i>Neocichla gutturalis</i> (Bocage, 1871)	*a	
Red-billed oxpecker <i>Buphagus erythrorhynchus</i> (Stanley, 1814) <sup>6,12</sup>		
Yellow-billed oxpecker <i>Buphagus africanus</i> Linnaeus, 1766	b	
Kurrichane thrush <i>Turdus libonyanus</i> (Smith, A, 1836)	*a,c,d	
White-browed robin chat <i>Cossypha heuglini</i> Hartlaub, 1866	*a,b,c,d	
Collared palm thrush <i>Cichladusa arquata</i> W. Peters, 1863	*b,c	
Miombo scrub robin <i>Cercotrichas barbata</i> (Hartlaub & Finsch, 1870)	*a	
White-browed scrub robin <i>Cercotrichas leucophrys</i> (Vieillot, 1817)	*a,b,c,d	
Common stonechat <i>Saxicola torquatus</i> (Linnaeus, 1766)	*a	1033C4
Capped wheatear <i>Oenanthe pileata</i> (Gmelin, 1789) <sup>6</sup>		
Arnot's chat <i>Pentholaea arnoti</i> (Tristram, 1869)	*a,d	
FAMILIAR CHAT <i>Cercomela familiaris</i> (Stephens, 1826)		
Mocking cliff chat <i>Thamnolaea cinnamomeiventris</i> (Lafresnaye, 1836)	*d	
MIOMBO ROCK THRUSH <i>Monticola angolensis</i> Sousa, 1888		
Southern black flycatcher <i>Melaenornis pammelaina</i> (Stanley, 1814)	a	
PALE FLYCATCHER <i>Bradornis pallidus</i> (von Müller, 1851)		
Spotted flycatcher <i>Muscicapa striata</i> (Pallas, 1764)	a,b,c	
Ashy flycatcher <i>Muscicapa caerulescens</i> (Hartlaub, 1865)	*a	1033C4
African dusky flycatcher <i>Muscicapa adusta</i> (Boie, 1828) <sup>6</sup>		
Böhm's flycatcher <i>Muscicapa boehmi</i> (Reichenow, 1884)	*a,d	
Lead-coloured flycatcher <i>Myioparus plumbeus</i> (Hartlaub, 1858)	*d	1033D3
COLLARED FLYCATCHER <i>Ficedula albicollis</i> (Temminck, 1815)		
Western violet-backed sunbird <i>Anthreptes longuemarei</i> (Lesson, 1833)	d	
Collared sunbird <i>Hedydipna collaris</i> (Vieillot, 1819)	c	1133B1
Amethyst sunbird <i>Chalcomitra amethystina</i> (Shaw, 1811)	*a,d	
Scarlet-chested sunbird <i>Chalcomitra senegalensis</i> (Linnaeus, 1766)	*a,b,c,d	1033D3



Name	Locality	Quadrat
Miombo double-collared sunbird <i>Cinnyris manoensis</i> (Reichenow, 1907) <sup>6</sup>		
Shelley's sunbird <i>Cinnyris shelleyi</i> (Alexander, 1899) <sup>12</sup>		
Purple-banded sunbird <i>Cinnyris bifasciatus</i> (Shaw, 1811)	a	1033C4
Variable sunbird <i>Cinnyris venustus</i> (Shaw, 1799)	*a	1033C4
Chestnut-backed sparrow-Weaver <i>Plocepasser rufoscapulatus</i> Buttkofer, 1888	*a	
Grey-headed sparrow <i>Passer griseus</i> (Vieillot, 1817)	b	1033C4
Yellow-throated petronia <i>Petronia supercilii</i> (Blyth, 1845)	*a,b,c,d	
Spectacled weaver <i>Ploceus ocularis</i> A. Smith, 1828	*a,b,c	
Holub's golden weaver <i>Ploceus xanthops</i> (Hartlaub, 1862)	*a,c	1033C4
Lesser masked weaver <i>Ploceus intermedius</i> Rüppell, 1845	*c	
Southern masked weaver <i>Ploceus velatus</i> Vieillot, 1819	*a,b	
Village weaver <i>Ploceus cucullatus</i> (Statius Müller, 1776)	*a,c	1033C4, 1133B1
Red-headed weaver <i>Anaplectes melanotis</i> (Sundevall, 1850)	*a,c,d	
Red-billed quelea <i>Quelea quelea</i> (Linnaeus, 1758)	*a,c	
Black-winged red bishop <i>Euplectes hordeaceus</i> (Linnaeus, 1758)	*a	1033C4
Southern red bishop <i>Euplectes orix</i> (Linnaeus, 1758) <sup>6</sup>		
Yellow bishop <i>Euplectes capensis</i> (Linnaeus, 1766)	*a,c	
Yellow-mantled widowbird <i>Euplectes macroura</i> (Gmelin, 1789) <sup>6</sup>		
White-winged widowbird <i>Euplectes albonotatus</i> (Cassin, 1848)	*a	
Red-collared widowbird <i>Euplectes ardens</i> (Boddaert, 1783) <sup>6</sup>		
Common waxbill <i>Estrilda astrild</i> (Linnaeus, 1758)	*a,b,c	1033C4
Blue waxbill <i>Uraeginthus angolensis</i> (Linnaeus, 1758)	*a,b,c,d	
Peters's twispot <i>Hypargos niveoguttatus</i> (Peters, 1868) <sup>6</sup>		
Orange-winged pytilia <i>Pytilia afra</i> (Gmelin, 1789)	*a	1033C4
Green-winged pytilia <i>Pytilia melba</i> (Linnaeus, 1758)	*a,c	1033C4
Red-billed firefinch <i>Lagonosticta senegala</i> (Linnaeus, 1766) <sup>6</sup>		
African firefinch <i>Lagonosticta rubricata</i> (Lichtenstein, 1823)	*a	
Jameson's firefinch <i>Lagonosticta rhodopareia</i> (von Heuglin, 1868) <sup>12</sup>		
Orange-breasted waxbill <i>Amandava subflava</i> (Vieillot, 1819)	*a	
Bronze manikin <i>Spermestes cucullatus</i> (Swainson, 1837)	*a,b	
Pin-tailed whydah <i>Vidua macroura</i> (Pallas, 1764)	*a	
LONG-TAILED PARADISE WHYDAH <i>Vidua paradisaea</i> (Linnaeus, 1758)		
Broad-tailed paradise whydah <i>Vidua obtusa</i> (Chapin, 1922) <sup>6</sup>		
Village indigobird <i>Vidua chalybeata</i> (Müller, 1776) <sup>6</sup>		
Dusky indigobird <i>Vidua funerea</i> (Tarragon, 1847) <sup>6</sup>		
PURPLE INDIGOBIRD <i>Vidua purpurascens</i> (Reichenow, 1883)		
Yellow wagtail <i>Motacilla flava</i> Linnaeus, 1758	b	
African pied wagtail <i>Motacilla aguimp</i> Dumont, 1821	b	
Yellow-throated longclaw <i>Macronyx croceus</i> (Vieillot, 1816)	b	
Grassland pipit <i>Anthus cinnamomeus</i> Rüppell, 1840	b	
Plain-backed pipit <i>Anthus leucophrys</i> Vieillot, 1818 <sup>6</sup>		
BUFFY PIPIT <i>Anthus vaalensis</i> Shelley, 1900		
TREE PIPIT <i>Anthus trivialis</i> Linnaeus, 1758		
Striped pipit <i>Anthus lineiventris</i> Sundevall, 1850	*d	

Name	Locality	Quadrat
Yellow-fronted canary <i>Crithagra mozambica</i> (Statius Müller, 1776)	*a,b,c,d	
BRIMSTONE CANARY <i>Crithagra sulphurata</i> (Linnaeus, 1766)		
Stripe-breasted seedeater <i>Crithagra reichardi</i> (Reichenow, 1882)	*a	1033C4
Black-eared seedeater <i>Crithagra mennelli</i> (Chubb, 1908)	a	
Cinnamon-breasted bunting <i>Emberiza tahapisi</i> A. Smith, 1836	a	1033C4
Golden-breasted bunting <i>Emberiza flaviventris</i> Stephens, 1815	*a	
Cabanis's bunting <i>Emberiza cabanisi</i> (Reichenow, 1875)	*a,c	

<sup>1</sup>Recorded only just outside the Reserve in agricultural land between camp and the Kawiya Gate.

<sup>2</sup>The new quadrat record refers to a sighting of *M. m. migrans*. The specimen is referable to *M. m. parasiticus*.

<sup>3</sup>These species were only recorded by voice.

<sup>4</sup>Seen by us, but only between sites.

<sup>5</sup>Benson, 1937

<sup>6</sup>McShane & McShane-Caluzi, 1988

<sup>7</sup>Benson, 1940a

<sup>8</sup>Benson, 1940b

<sup>9</sup>Benson, 1940c

<sup>10</sup>Benson, 1941

<sup>11</sup>Dowsett-Lemaire & Dowsett, 2006

<sup>12</sup>Dowsett-Lemaire, 2006