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# Conservation status of bird fauna of South West of Omo National Park, Ethiopia

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**A study on the conservation status of bird fauna of South West of Omo National Park (SWONP), South Western Ethiopia was conducted for dry (January - March, 2012) and wet (April - June, 2012) seasons. The study area was stratified based on vegetation (Riverine Forest land (RFL), Grass land (GL), and Bush land (BL)). Using systematic sampling, data was collected on birds in the morning (6:30 - 10:00 am) and evening (4.00 - 6:00 pm) for five days per week. A total of 129 species belonging to 96.12% were resident species and 3.8% were migratory. Among resident species *Psalidoprocne pristoptera, Cecropis abyssinica* and *Hirundo smithii* were the most common species and among migratory *Coracias abyssinicus, Merops supercilosus, Clamator levaillantii, Locustella naevia* and *Tringa glareola* were fairly common species. According to IUCN category, 109 species (83%) were Least Concern, 17 species (13%) have not yet been assessed, 3 species (2%) were vulnerable, 2 species (1%) were endangered and 1 species (1%) was near threatened for their conservation status. Of all recorded avian species based on their feeding assemblage status, 59 species (45.7%) were recorded to be insectivores, 30 species (23.3%) were recorded to be frugivores, 23 species (17.8%) were recorded to be insectivores-frugvores and 17 species (13.2%) were recorded to be omnivores. Vegetation structure complexity and season played great role on the species status, abundance and feeding assemblage status.**

**Key words:** Species status, habitat, vegetation, season.

## INTRODUCTION

Ethiopia is gifted with diverse biological resources. The diversity in wildlife is mainly because of the diversity in habitat, climate and different topographic ranges. For this reason, the country is considered among the biodiversity rich nations in the world (Zemede Asfaw, 2001). Even though, the country is rich in biological resources, a few of the wildlife has been threatened to varying degrees (Yalden et al., 1986; Yirmed Demeke et al., 2006). Today, most of the wildlife is mainly restricted to conservation areas such as national parks, wildlife reserves, forest areas and sanctuaries.

There are more than 1850 avian species found in Africa, of these 926 originate in Ethiopia, of which 16 are endemic (Redman et al., 2009). Ethiopia is one of the few countries in the world that possesses a unique and characteristic fauna with a high level of endemism

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(WCMC, 1991). There are 13 species restricted to the geographical region of Ethiopian highlands and thus shared by Ethiopia and Eritrea (Vivero Pol, 2001).

At present threatened bird fauna of Ethiopia are categorized as critically endangered (2 species), endangered (5 species included 4 endemic species), vulnerable (12 species) and near-threatened (14 species with 2 endemic species) (EWNHS, 1996). To keep these various and essential biological resources, Ethiopia has various protected areas. These protected areas represent only a small fraction of the total land mass and represent only a few of the diverse ecosystems of the country. In Ethiopia, protected areas stand for only about 2% of the total area of the country (Hillman, 1993).

Presently, Ethiopia has 22 national parks, 8 wildlife reserves, 3 wildlife sanctuaries and 18 control hunting areas (www.ewca.gov, 2012). All are playing critical conservation roles. In these protected areas, a lot of conservation work has been conducted including avian conservation. Omo National Park is one Ethiopian wildlife protected area which supports many avian species. The avian species of ONP are diversified and yet little research has been conducted concerning birds. According to Ethiopia wildlife and natural historical society (1996), this National Park encompasses more than 312 species of birds.

Omo National Park (ONP), which is the subject of the present study, is one of such places of conservation concern with very little biological information about birds. It is located between South Omo Zone and Bench Maji Zone. In Bench Maji Zone and South Omo Zone, the forest cover has been declining at a very fast rate from Mizan Tefere Zone by the Suri and Dizi ethnic groups and from South Omo Zone by the Mursi, Nyangatom and Idini ethnic groups. This is mainly due to the increase in human and livestock population. This habitat loss is likely to negatively affect the avifauna and other wild animals inhabiting in the area. However, nothing is known about the extent of impact the avifauna of the area. ONP was initially nominated for the conservation of major protection of biodiversity as a National park (Zelealem Tefera, 1994).

This study aimed at providing habitat and season associated bird IUCN status, relative abundance and feeding assemblage status. It was intended to prepare a well-organized bird document to serve researcher, conservationist and bird watcher as baseline information for the area of the SWONP and to provide the final result to Ethiopia wildlife conservation authority to use as database for SWONP avian.

## METHODOLOGY

### Study area description

The study was conducted in a protected area of ONP in the south west of the park. This National Park is situated in south west of Addis Ababa at 870 km close to Ethio-Sudan and Kenya borders. ONP is found between two administrative zones (South Omo and Bench Maji). It is demarcated by Omo River in the east, by the foothills of the Maji Mountains in the North West and Neruth River in the South. The latitude and longitude is between 5°29'- 6°35'N and 35°33'- 35° 56'E. The total area of this national park is 3566 $km^2$. Also, this national park area was demarcated in the south by the Nyangatom woreds, in the north by the Surima worda, in the east by the Mursi (Hana) woreda, Mui River in the north and Omo River in the south east (Figure 1).

Omo National Park supports 75 species of mammals, 325 species of birds, 13 species of fish and 11 species of Amphibians were recorded (Hilliman,1993). The most notable mammals are the exceptional herds of Eland and Tiang. The former is the only protected population of the species in the country. The park protects one of the world's largest populations of lesser kudu (park brochure), other wild animals such as common Eland, cheetah, Elephant, Giraffe, Buffalo, lesser kudu, waterbuck, Dik dik, Duiker, lion, Hyena, Orbi, Topi, Lelew hartebeest and Warthog (Hilliam, 1993; Zelalem Tefera, 1994).

The agro-climatic zone of ONP is upper and lower kola zone. The altitude of the area ranges between 450 and 1541 m above sea level (masl) and there are three major physiographic features of the country around ONP: the Great Rift Valley, the lake Turkan basin and the Ethiopian high land massif. The Great Rift Valley, faulting and volcanic activity associated with the park are the principal determinants of the park physical features (Stephenson and Mizuno, 1978). The meteorological information shows that this area receives annual rain fall of 500 to 1000 mm. The rain in the park is erratic and varies from time to time. The main wet season is April up to June. The main dry season is December up to March. The area's mean maximum temperature is 36.68°C with mean minimum temperature of 21.90°C (Zelalem Tefera, 1994). Vegetation of ONP is categorized according to the average rain fall. Sub humid areas received between 700 and 1000 mm per year, semiarid areas received between 400 and 700 mm per year, while arid areas received <400 mm per year. ONP comprises of approximately 20% sub humid, 60% semiarid and 20% arid lands.

The park has different vegetation type, which serve recreational purpose. These include the view point in the peak of mountain in the park. Two known viewpoints near the park head quarter are Mizino and Dirga view points in the east and south west. The scenic beauty of the park on these view point is interesting. In the view point's interesting plains (Tinign, Illilbai, Sai, Birke) with plain game animals, the mountain range, valley and riverine vegetation along Mui River increase the recreational values. In this area, the potential of viewing wildlife, sport hunting, photo safari, river rafting, cultural site and traditional visits are the most commonly conducted tourist activities. Omo National Park has the highest tourist potential, however, the least visited park in the region. In the park, there is tented modern safari operation with full shower and kitchen material to use. This is popular in the country and abroad. To visit this beautiful national park, there are good opportunities in road access by Jima-Maji line in both season.

The ONP lies in one of the most culturally diverse areas in the whole Africa where many elements of nomadic life styles are still protected (Gemedo, 2003). To the west 'surma' or 'suri' who speak Nilo Saharan language reflecting their origin from the Nile basin. They cultivate sorghum and millet in the Maji high lands in west of omo valley and keep large herds of cattle and goats. The Mursi relative characteristics are that 'lip disk' for which they and their relatives use. A young women's lower lip and ears are pierced and stretched by inserting big clay disk up of 12 cm in diameter. The bigger the disk the better a woman's chances of securing a wealth of husband. To the east, the Mursi, a small tribe of some 500

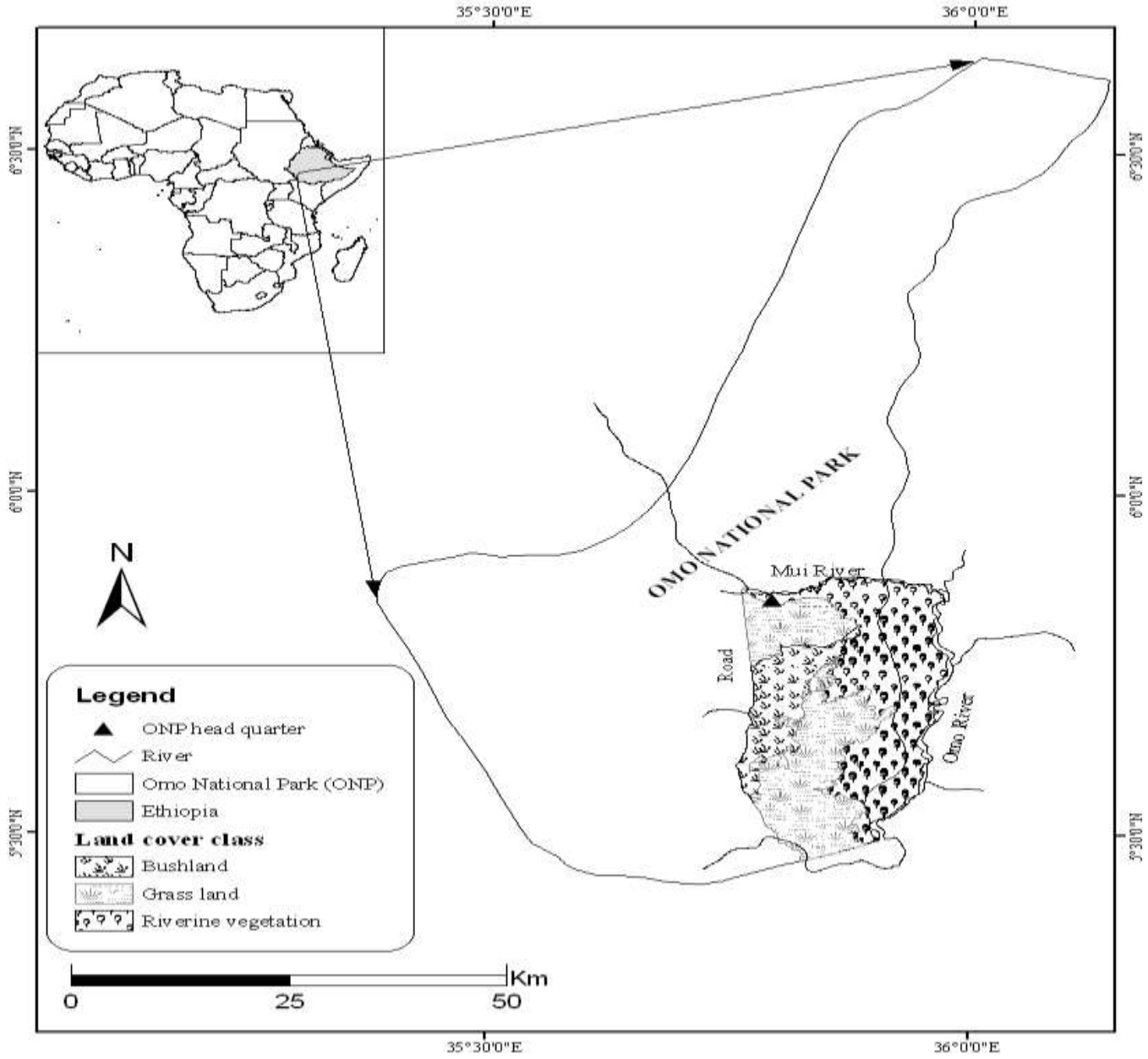


**Figure 1.** Map of the study area.

people are found. They cultivate maize and sorghum a round river leaves when the water level is low, and also in the fields away from the rivers. They supplement their livelihood with large herds of cattle from which they get meats, blood and milk. Along the Omo River, is a small, somewhat mysterious groups of less than thousand people, the 'Kwegu'. The Kwegu subsists in the river environs where they assist the Mursi to cultivate when the river leaves each year when the flood recedes (Turton, 1987). They mostly fish and hunt. In the south part on the west side of the Omo River are Bume (Nyangatome ethnic group), a primarily nomadic people who rely more on their livestock than the other people of the Omo areas (Stephenson and Mizuno, 1978).

**Sampling design**

Ecological survey of birds inside ONP in the south west side of the park was carried out during January 2012 to gather relevant information about the study area. Topographical features and vegetation cover of the area were assessed.

Systematic sampling units were selected for all the study area. A number of 38 sampling units representing each habitat type (BL, GL and RFL) were selected based on systematic sampling method. The technique involved dividing the study area into sample units by choosing the location of each habitat with random numbers (Sutherland, 2006). Sample units were selected by systematic to

**Table 1.** Estimation of a crude ordinal scale of abundance.

| Abundance category (Number of individuals per 100 field hours) | Abundance score | Ordinal scale |
|---|---|---|
| <0.1 | 1 | Rare |
| 0.1-0.2.0 | 2 | Uncommon |
| 2.1-10.0 | 3 | Frequent |
| 10.1-40.0 | 4 | Common |
| 40.0+ | 5 | Abundant |

make sure that the results were generally representatives of the whole study area (Bibby et al., 1992). For counting birds point count method was employed in the RFL and BL, while line transects method were employed in the GL. Systematic random sampling methods were employed for point and line transects methods.

Point count method was undertaken from a fixed location within the sample unit of radius 15 m for 5 min. To minimize disturbance during count, a waiting period of 3 min were applied. Where point count technique was employed, the radial distance from which the avian species occurred was estimated and the type and group number of species were recorded using binoculars. Large numbers of point count locations (more than 15) were identified from each study plot. There were 9 sample unit in RFL and 15 sample unit in BL. In each sample unit (1 × 1 $km^2$), a total of 20 point count stations were allocated. In each point count station, a minimum distance of 150 to 200 m was employed using GPS to avoid double counting (Sutherland, 2006).

In GL, a total of 14 sample units were selected. In each sample unit, a total of 3 transect lines with a length of 1 km were located. A bird heard and seen were recorded within 50 to 100 m on either side of the transect line making a total width of 200 to 300 m. Transect lines within a sample unit were 250 to 300 m apart from each other to avoid double counting (Bibby et al., 1992, 1998; Hostler and Martin, 2006).

#### Data analysis

Point count and transect line data were analyzed with respect to (1) Relative abundance, (2) Species diversity, and (3) Using descriptive statistics' (mean and standard deviation) to analyze abundance and percentage expression at different level.

The relative abundance of avian species were determined using encounter rates that give crude ordinal scales of abundance as abundant, common, frequent, uncommon and rare (Bibby et al., 1998). Encounter rate were calculated for each species by dividing the number of birds to hours spent searching, in order to get a figure of avian species per hour for each species. Estimation of a crude ordinal scale of abundance using encounter rates as shown in Table 1

The species IUCN categories was identified based on species IUCN 2010 categories. Excel program was used to draw graphs and tables. Data obtained during the survey was analyzed using SPSS (version 20) statistical package to employ one way analysis of variance (ANOVA) to see the effect of habitat composition on abundance of avian species between in different seasons.

## RESULTS

### Species status

A total of 129 species of birds were recorded during the study from south west of Omo National Park. Of these, 124 species (96.12%) were residents and 5 species (3.8%) were migratory. Of all migratory species, 2 species (1.5%) included Intra-tropical migrants, 1 species (0.7%) included Intra-African migrant and 2 species (1.5%) were pale arctic migrants (Table 2). The migratory bird detection revealing that there are different bird group which visit SWONP in summer (dry) and winter (wet) season. Of two pale arctic migrants, *Locustella naevia* was recorded in February only (summer visitor) and the other *Tringa glareol* was recorded in April and May (winter visitor). *Coracias abyssinicus* and *Merops superciliosus* were species resident and intra-tropical migrant. *Clamator levaillantii* was uncommon resident and intra African migrants recorded in the park. The only near endemic avian species recorded in the study area was *Agapornis taranta* (Table 2).

Of all species (based on the abundance scale), 88% of the species was recorded as frequent, 6% uncommon, 4% common and 2% abundant (Figure 2 and Table 2).

As per IUCN Red List (2012), 109 species (83%) were least concern, 17 species (13%) have not yet been assessed, 3 species (2%) were vulnerable, 2 species (1%) were endangered and 1 species (1%) was near threatened for their conservation status (Figure 3 and Table 2).

Of 129 avian species based on their feeding guild 59 species (45.7%) were feeding on insect (insectivores), 30 species (23.3%) were feeding on fruit (frugivores), 23 species (17.8%) were feeding on both insect and fruit (insectivores-frugvores) and 17 species (13.2%) omnivores (Table 2 and Figure 4).

### Status of birds according to habitats based on crude ordinal scale

During dry season, in BL, 68.4% of the species were recorded to be frequent, 21.05% common, 7.02% abundant and 3.5% uncommon (Tables 3 and 4). In wet season, 73.02% of the species were recorded to be frequent, 22.2% common, 3.17% abundant and 1.6% uncommon (Tables 3 and 7). In GL during dry season, 63.04% of the species were frequent and 36.9% uncommon (Tables 3 and 6). In wet season, 77.7% frequent and 28.8% uncommon (Tables 3 and 9). In RFL

**Table 2.** Bird species observed in south west of Omo National Park (SWONP).

| Ordinal common name | Scientific name | IUCN and Feeding | Status scale |
|---|---|---|---|
| African Harrier- Hawk | *Polyboroides typus* | LC/OM | Uncommon |
| White-headed Vulture | *Trigonoceps occipitalis* | V/OM | Frequent |
| Yellow- billed Kite | *Milvuus aegyptius* | LC/OM | Frequent |
| Hooded Vulture | *Necrosyrtes monachus* | E/OM | Frequent |
| White-backed Vulture | *Gyps africanus* | E/OM | Frequent |
| Lappet-faced Vulture | *Torgos tracheliotus* | V/OM | Frequent |
| Brown Snake-Eagle♥ | *Circaetus cinereus* | LC/OM | Frequent |
| Bateleur | *Terathopius ecaudatus* | NT/OM | Frequent |
| Dark chanting Goshawk | *Melierax metabates* | LC/IN | Frequent |
| Tawny Eagle | *Aquila rapax* | LC/OM | Frequent |
| Long-crested Eagle | *Lophaetus occipitalis* | LC/OM | Frequent |
| Gabar Goshawk♣ | *Micronisus gabar* | LC/IN | Frequent |
| Woodland Kingfisher | *Halcyon senegalaloides* | LC/OM | Frequent |
| African pygmy Kingfisher♣ | *Ceyx pictus* | LC/OM | Frequent |
| Half –collared Kingfisher | *Alcedo semitorquata* | NYA/OM | Frequent |
| Gaint Kingfisher ♣ | *Megaceryle maxima* | LC/OM | Frequent |
| Pied Kingfisher | *Ceryle rudis* | LC/OM | Frequent |
| Grey-headed kingfisher ♣ | *Halcyon leucocephala* | LC/OM | Frequent |
| Egyptian Goose | *Alopochen aegyptiaca* | LC/IF | Frequent |
| African Darter | *Anhinga rufa* | LC/IN | Frequent |
| Cattle Egret | *Bubulcus ibis* | LC/IN | Frequent |
| Striped Heron | *Butorides striata* | LC/NYA | Frequent |
| Great Egret♥ | *Egretta alba* | LC/IN | Frequent |
| Grey Heron | *Ardea cinerea* | LC/IN | Frequent |
| Red-billed Hornbill | *Tockus erythrorhynchus* | LC/FR | Frequent |
| Jackson's Hornbill | *Tockus jacksoni* | LC/FR | Frequent |
| African Grey Hornbill♣ | *Tockus nasutus* | LC/FR | Frequent |
| Abyssinia Ground-hornbill | *Bucorvus abyssinicus* | NYA/IF | Frequent |
| Senegal Thick-knee | *Burhinus senegalensis* | LC/IN | Frequent |
| Spotted Thick-knee | *Burhinus capensis* | LC/IN | Frequent |
| Red-fronted Tinkerbird♣ | *Pogoniulus pusillus* | LC/FR | Frequent |
| Black-throated Barbet♣ | *Tricholaema melanocephala* | LC/FR | Frequent |
| Double-toothed Barbet | *Lybius bidentatus* | LC/FR | Frequent |
| Red –and-yellow Barbet ♣ | *Trachyphonus erythrocephalus* | LC/FR | Frequent |
| Spur-winged Plover | *Vanellus spinosus* | LC/IN | Frequent |
| Woolly-necked Stork♣ | *Ciconia abdimii* | LC/IN | Frequent |
| Yellow-billed Stork | *Mycteria ibis* | LC/IN | Frequent |
| Saddle-billed Stork | *Ephippiorhynchus segegalensis* | LC/IN | Frequent |
| Marabou Stork | *Leptoptilos crumeniferus* | LC/IN | Frequent |
| Tawny-flanked Prinia ♥ | *Prinia subflava* | LC/FR | Frequent |
| Blue-naped Mouse bird | *Urocolius macrourus* | NYT/FR | Frequent |
| Speckled Mouse bird | *Colius striatus* | NYT/FR | Common |
| Bruce's Green Pigeon | *Treron waalia* | LC/IN | Uncommon |
| Emerald- spotted wood Dove | *Turtur chalcospilos* | LC/FR | Frequent |
| African Mournig Dove ♥ | *Streptopelia decipiens* | NYA/FR | Frequent |
| Ring- necked Dove | *Streptopelia capicola* | LC/IF | Frequent |
| Laughing Dove | *Streptopelia senegalensis* | LC/IF | Frequent |
| Namaqua Dove ♣ | *Oenacapensis* | LC/FR | Frequent |
| Abyssinia Roller☼ | *Coracias abyssinicus* | NYA/IF | Frequent |

**Table 2.** Contd.

| | | | |
|---|---|---|---|
| Rufous-crowned Roller ♣ | *Coracias naevius* | LC/FR | Frequent |
| Levaillant's Cuckoo ϴ | *Clamator levaillantii* | LC/FR | Frequent |
| White-browed Coucal♥ | *Centropus superciliosus* | LC/IF | Frequent |
| Black Cuckoo | *Cuculus clamosus* | LC/IF | Frequent |
| Yellow bill | *Ceuthmochares aereus* | NYA/IF | Frequent |
| Blue-headed Coucal♥ | *Centropus monachus* | LC/IN | Frequent |
| Fork- tailed Drongo | *Dicrurus adsimilis* | LC/IN | Frequent |
| Red-cheeked cordon-blue | *Uraeginthus bengalus* | NYA/IN | Frequent |
| Purple Grenadier | *Uraeginthus ianthinogaster* | LC/IN | Frequent |
| Red-billed Firefinch | *Lagonosticta senegala* | LC/IN | Frequent |
| Black Saw-wing | *Psalidoprocne pristoptera* | LC/IN | Abundant |
| Lesser Striped Swallow | *Cecropis abyssinica* | LC/IN | Abundant |
| Red-rumped Swallow | *Cecropis daurica* | LC/IN | Common |
| Wire-tailed Swallow | *Hirundo smithii* | LC/IN | Common |
| Greater Honey guide | *Indicator indicator* | NYA/IN | Frequent |
| Lesser Honey guide | *Indicator minor* | NYA/IN | Frequent |
| Grey-backed Fiscal♣ | *Lanius excubitorius* | LC/IN | Frequent |
| Northern White-crowned Shrike | *Eurocephalus rueppelli* | LC/FR | Frequent |
| Sulphur- breasted Bush-Shrike | *Telophorus sulfureopectus* | LC/IF | Frequent |
| Black-crowned Tchagra | *Tchagra senegalus* | LC/FR | Frequent |
| Slate-coloured Boubou | *Laniarius funebris* | LC/IN | Frequent |
| Brubru♣ | *Nilaus afer* | LC/IN | Frequent |
| Black-headeed Gonolek | *Laniarius erythrogaster* | NYA/FR | Frequent |
| Northern Carmine Bee-eater | *Merops nubicus* | LC/IN | Frequent |
| Little Bee-eater | *Merops pusillus* | LC/IN | Frequent |
| Madagascar Bee-eater ☼ ♥ | *Merops superciliosus* | LC/IN | Frequent |
| African Paradise Flycatcher | *Terpsiphone viridis* | LC/IN | Frequent |
| African Pied Wagtail | *Motacilla aguimp* | LC/FR | Frequent |
| Grass land Pipit♣ | *Cinnamomeus* | NYA/IN | Frequent |
| Northern Black Flycatcher | *Melaenornis edolioides* | LC/IN | Frequent |
| African Grey Flycatcher | *Bradornis microrhynchus* | LC/IN | Frequent |
| African Dusky Flycatcher | *Muscicapa adusta* | LC/IN | Frequent |
| White-bellied Go-away-bird | *Corythaixoides leucogaster* | LC/FR | Frequent |
| Eastern Grey Plantain-eater | *Crinifer zonurus* | LC/FR | Frequent |
| Eastern Violet-backed Sunbird♣ | *Anthreptes orientalis* | LC/IN | Frequent |
| Hunter's Sunbird ♥ | *Chalcomitra hunter* | LC/IN | Frequent |
| Beautiful Sunbird | *Cinnyris pulchellus* | LC/IN | Frequent |
| Shining Sunbird | *Cinnyris habessinicus* | LC/IN | Frequent |
| Variable Sunbird | *Cinnyris venustus* | LC/IN | Frequent |
| Helmeted Guineafowl | *Numida meleagris* | LC/IF | Frequent |
| White- bellied Bustard ♣ | *Eupodotis senegalensis* | LC/IN | Uncommon |
| Kori Bustard | *Ardeotis kori* | LC/IN | Uncommon |
| Black-headed Oriole | *Oriolus larvatus* | LC/FR | Frequent |
| Swainson's Sparrow | *Passer swainsonii* | LC/IF | Frequent |
| Yellow-spotted Petronia | *Petronia pyrgita* | LC/FR | Frequent |
| White- bellied Bustard ♣ | *Eupodotis senegalensis* | LC/IN | Uncommon |
| Kori Bustard | *Ardeotis kori* | LC/IN | Uncommon |
| Black-headed Oriole | *Oriolus larvatus* | LC/FR | Frequent |
| Swainson's Sparrow | *Passer swainsonii* | LC/IF | Frequent |
| Yellow-spotted Petronia | *Petronia pyrgita* | LC/FR | Frequent |

**Table 2.** Contd.

| | | | |
|---|---|---|---|
| Long-tailed Cormorant | *Phalacrocoraax africanus* | LC/IN | Frequent |
| Crested Francolin | *Dendroperdix sephaena* | LC/IF | Frequent |
| Yellow-necked Spurfowl ♥ | *Pternistis leucoscepus* | LC/IN | Frequent |
| Violet Wood-hoopoe ♥ | *Phoeniculus damarensis* | LC/FR | Frequent |
| Cardinal Woodpecker | *Dendropicos fuscescens* | LC/IN | Frequent |
| Nubian Woodpecker ♥ | *Campethera nubica* | LC/IN | Frequent |
| Breaded Woodpecker | *Dendropicos namaquus* | LC/IN | Frequent |
| White-headed Buffalo-Weaver | *Dinemellia dinemelli* | LC/IF | Frequent |
| White-browed Sparrow- Weaver | *Plocepasser mahali* | LC/FR | Frequent |
| Little Weaver ♣ | *Ploceus luteolus* | LC/IF | Frequent |
| Red-headed Weaver | *Anaplectes rubriceps* | LC/IF | Frequent |
| Village Weaver♣ | *Plooceus cucullatus* | LC/IF | Frequent |
| Little Grebe | *Tachybaptus ruficollis* | LC/IN | Uncommon |
| White-crested Helmet shrike | *Prionops plumatus* | NYA/IF | Frequent |
| Meyer's Parrot | *Poicephalus meyeri* | LC/FR | Frequent |
| Black-winged Lovebird♣¤ | *Agapornis taranta* | LC/FR | Frequent |
| Common Bulbul | *Pycnonotus barbatus* | LC/IN | Common |
| Black-winged Stilt | *Himantopus himantopus* | LC/IN | Frequent |
| Secretary bird | *Sagittarius serpentarius* | V/IF | Uncommon |
| Wood Sandpiper♣◊ | *Tringa glareola* | LC/IN | Uncommon |
| Hamerkop♣ | *Scopus umbretta* | LC/IN | Frequent |
| Verreaux's Eagle-Owl | *Bubo lacteus* | LC/IN | Frequent |
| Pearl-spotted Owlet♥ | *Glaucidium albertinum* | LC/IN | Frequent |
| Common Ostrich | *Struthio comelus* | LC/IF | Frequent |
| Rupp ell's Starling | *Lamprotornis purpuriptera* | NYA/FR | Frequent |
| Superb Starling | *Lamprotornis superbus* | LC/FR | Frequent |
| Shelley's Starling♣ | *Lamprotornis shelleyi* | LC/FR | Frequent |
| Red-billed Oxpecker | *Buphagus erythrorhynchus* | LC/IN | Common |
| Yellow- billed Oxpecker ♣ | *Buphagus africanus* | LC/IN | Frequent |
| Common Grasshopper Warbler◊♥ | *Locustella naevia* | LC/IN | Uncommon |
| Hadada Ibis | *Bostrychia hagedash* | LC/IN | Frequent |
| Sacred Ibis♣ | *Threskiornis aethiopicus* | LC/IN | Frequent |
| Dusky Babbler♥ | *Turdoides tenebrosa* | LC/IN | Frequent |
| African Trush | *Turdus pelios* | NYA/IF | Frequent |

♥ **=**Dry season only recorded species, ♣ **=**Wet season only recorded species, ☼ **=**Resident and perhaps intra -Tropical migrants, Θ =Resident and intra-African migrant, ◊ =Pale arctic migrant**,** ■=Endemic and unmarked species are resident avian, and (LC = Least concern, E= Endangered, NT = near threatened, V= Vulnerable and NYA **=** Not yet assessed) and (IN= Insectivores, FR= Frugivores, IF= Insectivores-Frugivores and OM= Omnivores).

during dry season 52.9% of the species were frequent, 44.12% common and 2.9% abundant (Tables 3 and 5). In wet season, 56.4% of the species were uncommon, 41.02% frequent and 2.56% abundant (Tables 3 and 8).

## DISCUSSION

South West of Omo National Park supported resident, migratory and globally threatened bird species. The park was identified as an important refuge for resident bird species (124 species). This may be due to the effect of biotic and a biotic factor such as continuous habitat resource availability, vegetation structure complexity of the study area and adaptive nature of species to physical feature of ONP (Jarvinen, 1983). Black winged love bird *Agapornis taranta* is endemic to Ethiopia and Eretria. Viveropol (2001) species which are endemic to just country add a particular interest to its fauna.

The IUCN red list (IUCN, 2010) indicated that the study area supported endangered (1 species), vulnerable (3 species), near threatened (1 species), and not yet

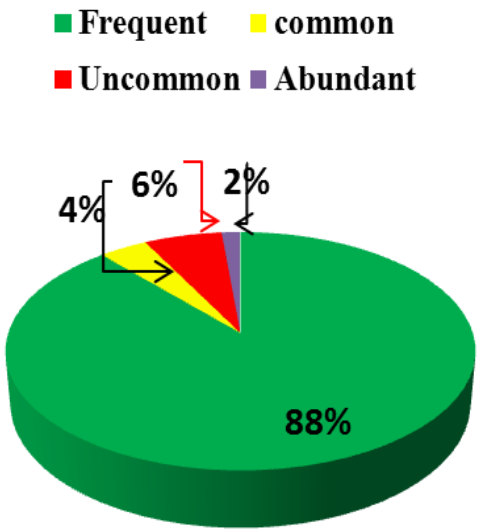


**Figure 2.** The percentage of bird species curd ordinal scale.

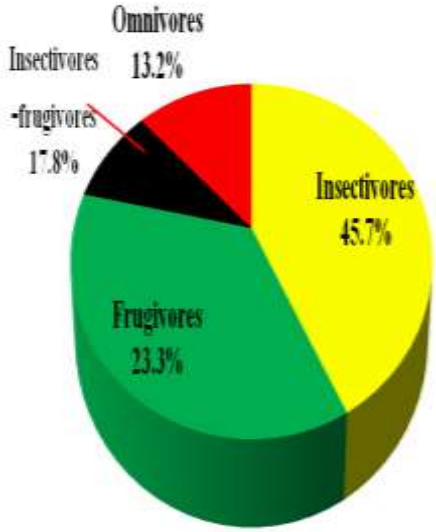


**Figure 4.** Feeding guild status of Birds in SWONP.

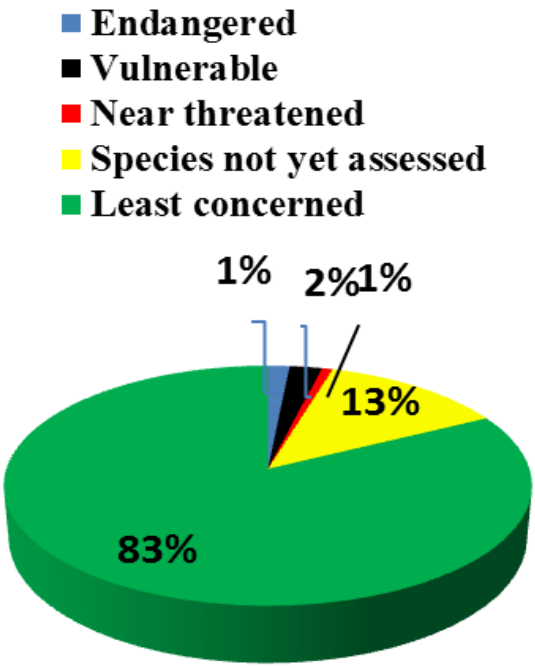


**Figure 3.** IUCN Status of Birds in SWO NP.

assessed (17 species) species of birds. The abundance of these globally threatened species in the park found to be common. This is promising issue for threatened species conservation on global scale. Today, the IUCN Red List of threatened species remains the authoritative source on baseline information to know conservation status of globally threatened species and to manage them (Rodrigues et al., 2006).

As the crude ordinal scale indication, most species were frequent throughout the habitats. This may be due to the habitat quality of study area. The crude ordinal categories of abundance derived from encounter rate data were very important in annotating the species list (Robertson and Lily, 1998). So, a total of 88% of species were found to be frequent, 8% species were uncommon, 2% of species were abundant and 2% of species common.

## Conclusion

The present study revealed that SWONP supported a variety of avifauna due to availability of mosaic of habitats. Both resident and migratory species of birds were recorded from the park, however, the residents had dominated. The globally threatened species took shelter in the park in high abundance. The variation in the species and numbers among habitat and between seasons is observed. The habitat heterogeneity and seasonal variability in forage availability affected the distribution and abundance of birds in the park.

Therefore the department of ONP staff, EWCA and the regional and federal bureau of culture and tourism should take over the responsibility of managing this resource properly supported by scientific information. Findings of this study identified important sites holding bird diversity, conservation priority species and which hold value for planning management plan for wildlife in general and birds in particular. Researchers' finding

**Table 3.** The relative abundance of bird species during dry and wet season using Encounter rates (Tables 4, 5, 6 , 7, 8 and 9).

| Habitat | Season | Rank | | | | |
|---|---|---|---|---|---|---|
| | | Rare | Uncommon | Frequent | Common | Abundant |
| BL | Dry | 0 | 2 | 39 | 12 | 4 |
| | Wet | 0 | 1 | 46 | 14 | 2 |
| | Both | 0 | 8 | 60 | 12 | 5 |
| GL | Dry | 0 | 17 | 29 | 12 | 1 |
| | Wet | 0 | 13 | 32 | 12 | 1 |
| | Both | 0 | 15 | 31 | 12 | 1 |
| RFL | Dry | 0 | 0 | 18 | 15 | 1 |
| | Wet | 0 | 22 | 16 | 0 | 1 |
| | Both | 0 | 15 | 16 | 8 | 2 |

BL: Bush land; GL: grass land; RFL: riverine forest land.

**Table 4.** Relative abundance of avian in the bush land habitat during the dry season.

| Species | No. of individuals in 10 field hours | Abundance score | Rank |
|---|---|---|---|
| Rupp ell's long tailed starling | 9.81 | 3 | Frequent |
| Helmeted Guineafowl | 10.58 | 4 | Common |
| Red-billed Horn bill | 9.81 | 3 | Frequent |
| Black headed Gonolek | 3.74 | 3 | Frequent |
| White-bellied Go-away-bird | 11.52 | 4 | Common |
| Hooded vulture | 5.29 | 3 | Frequent |
| Lappet-faced vulture | 4.67 | 3 | Frequent |
| Northern Black flycatcher | 7.78 | 3 | Frequent |
| Red billed ox pecker | 21.79 | 4 | Common |
| African mourning Dove | 38.92 | 4 | Common |
| African Grey Flycatcher | 118.32 | 5 | Abundant |
| Long crested Eagle | 20.24 | 4 | Common |
| Hamerkop | 12.45 | 4 | Common |
| Hunter's sun bird | 38.92 | 4 | Common |
| Grey Heron | 43.59 | 5 | Abundant |
| Red billed fire finch | 12.61 | 4 | Common |
| Purple Grenadier | 5.45 | 3 | Frequent |
| Pied King Fisher | 7.32 | 3 | Frequent |
| Common Bulbul | 21.17 | 4 | Common |
| African Darter | 1.56 | 2 | Uncommon |
| Speckled mouse bird | 17.75 | 4 | Common |
| White-browed Sparrow Weaver | 10.43 | 4 | Common |
| White headed buffalo Weaver | 5.6 | 3 | Frequent |
| Pearl spotted owlet | 3.11 | 3 | Frequent |
| African Fish Eagle | 5.29 | 3 | Frequent |
| Black saw-wing | 65.23 | 5 | Abundant |
| Shining sun bird | 5.6 | 3 | Frequent |
| Yellow-necked spur fowl | 6.07 | 3 | Frequent |
| Bateleur | 3.58 | 3 | Frequent |
| Swainson's Sparrow | 5.76 | 3 | Frequent |

**Table 4.** Contd.

| | | | |
|---|---|---|---|
| Cardinal Wood pecker | 2.96 | 3 | Frequent |
| Dusky Babbler | 7.47 | 3 | Frequent |
| African paradise fly catcher | 8.25 | 3 | Frequent |
| Abyssinian Roller | 8.41 | 3 | Frequent |
| Red-rumped Swallow | 35.65 | 4 | Common |
| Black-crowned tchagra | 6.38 | 3 | Frequent |
| Lesser striped swallow | 101.05 | 5 | Abundant |
| Dark chanting Goshawk | 5.14 | 3 | Frequent |
| Beautiful sun bird | 4.98 | 3 | Frequent |
| Tawny-Eagle | 5.14 | 3 | Frequent |
| White-backed vulture | 5.76 | 3 | Frequent |
| Brown-snake Eagle | 4.67 | 3 | Frequent |
| Blue headed coucal | 26.47 | 3 | Frequent |
| Meyer's (brown) parrot | 4.67 | 3 | Frequent |
| Red-capped cordon-blue | 7.32 | 3 | Frequent |
| Yellow Spotted Petronia | 9.65 | 3 | Frequent |
| Burbur | 3.58 | 3 | Frequent |
| Blue-naped Mouse bird | 9.49 | 3 | Frequent |
| Nubian Woodpecker | 0.93 | 2 | Uncommon |
| Wood land king fisher | 4.05 | 3 | Frequent |
| Violet wood-hoopoe | 5.6 | 3 | Frequent |
| Tawny-flanked Prinia | 4.2 | 3 | Frequent |
| Sulphur-breasted Bush-Shrike | 4.82 | 3 | Frequent |
| Fork tailed Drogon | 7.78 | 3 | Frequent |
| Ring-necked Dove | 8.87 | 3 | Frequent |
| Emerald-spotted wood dove | 5.45 | 3 | Frequent |
| Verreaux's Eagle-Owl | 6.92 | 3 | Frequent |

**Table 5.** Relative abundance of avian in the Riverine forest land habitat during the dry season.

| Species | No. of individuals in 10 field hours | Abundance score | Rank |
|---|---|---|---|
| Grey Heron | 9.58 | 3 | Frequent |
| Woodland Kingisher | 9.84 | 3 | Frequent |
| White bellied Go- away-bird | 5.45 | 3 | Frequent |
| Saddle billed Stork | 10.11 | 4 | Common |
| Reed (Long-tailed) cormorant | 11.71 | 4 | Common |
| African Darter | 12.24 | 4 | Common |
| Hamerkop | 7.45 | 3 | Frequent |
| Greater Egret | 10.65 | 4 | Common |
| Striped Heron | 10.91 | 4 | Common |
| Yellow-billed Stork | 13.84 | 4 | Common |
| African fish Eagle | 7.72 | 3 | Frequent |
| Dark chanting Goshawk | 8.25 | 3 | Frequent |
| Tawny Eagle | 11.18 | 4 | Common |
| Black winged Stilt | 11.97 | 4 | Common |
| Senegal Thick-Knee | 10.91 | 4 | Common |
| Gaint Kingfisher | 13.84 | 4 | Common |
| African Mourning Dove | 14.9 | 4 | Common |
| Black-winged Love Bird | 4.52 | 3 | Frequent |

**Table 5.** Contd.

| | | | |
|---|---|---|---|
| Eastern Grey plantain-eater | 4.26 | 3 | Frequent |
| Levaillant's Cuckoo | 9.58 | 3 | Frequent |
| Black Cuckoo | 4.52 | 3 | Frequent |
| Yellow bill Coucal | 7.72 | 3 | Frequent |
| Speckled mouse bird | 8.78 | 3 | Frequent |
| Pied king fisher | 5.32 | 3 | Frequent |
| African Pygmy king fisher | 8.78 | 3 | Frequent |
| Cardinal Wood pecker | 5.32 | 3 | Frequent |
| Black saw-wing | 63.61 | 5 | Abundant |
| African pied wagtail | 12.51 | 4 | Common |
| African Trush | 9.31 | 3 | Frequent |
| African paradise fly catcher | 15.17 | 4 | Common |
| Black-headed Oriole | 11.44 | 4 | Common |
| Lesser Honey guide | 2.39 | 3 | Frequent |
| Common Bulbul | 21.03 | 4 | Common |
| Violet Wood-hoopoe | 6.92 | 3 | Frequent |

**Table 6.** Relative abundance of avian in the grass land habitat during the dry season.

| Species | No. of individuals in 10 field hours | abundance score | Rank |
|---|---|---|---|
| Yellow billed kite | 2.55 | 3 | Frequent |
| Secretary birds | 1.44 | 2 | Uncommon |
| White-bellied Bustard | 1.99 | 2 | Uncommon |
| Lesser honey guide | 2.77 | 3 | Frequent |
| Ring-necked dove | 4.21 | 3 | Frequent |
| Common ostrich | 2.43 | 3 | Frequent |
| Dark chanting Goshawk | 2.21 | 3 | Frequent |
| Spotted Thick knee | 2.65 | 3 | Frequent |
| African Harrier Hawk | 2.21 | 2 | Uncommon |
| Spur-winged plover | 3.54 | 3 | Frequent |
| White-backed vulture | 3.54 | 3 | Frequent |
| Lappet-faced vulture | 1.21 | 2 | Uncommon |
| Hooded vulture | 1.54 | 2 | Uncommon |
| Northern carmine bee-eater | 6.09 | 3 | Frequent |
| African pied wagtail | 3.65 | 3 | Frequent |
| Woolly necked stork | 1.99 | 2 | Uncommon |
| Cattle Egret | 3.87 | 3 | Frequent |
| Marabou Stork | 2.76 | 3 | Frequent |
| Hadada Ibis | 1.43 | 2 | Uncommon |
| Greater Egret | 3.87 | 3 | Frequent |
| Jackson's Horn bill | 3.09 | 3 | Frequent |
| Brown-Snake Eagle | 1.88 | 2 | Uncommon |
| Tawny Eagle | 1.66 | 2 | Uncommon |
| Bateleur | 5.09 | 3 | Frequent |
| Kori Bustard | 2.1 | 3 | Frequent |
| Brue's Green Pigeon | 0.55 | 2 | Uncommon |
| Pearl-spotted Owlet | 1.1 | 2 | Uncommon |
| Verreaux's Eagle-Owl | 1.54 | 2 | Uncommon |
| Blue-naped Mouse bird | 2.61 | 3 | Frequent |

**Table 6.** Contd.

| | | | |
|---|---|---|---|
| Slate-coloured Boubou | 2.54 | 3 | Frequent |
| Madagascar Bee-eater | 1.66 | 2 | Uncommon |
| Rufous-crowned Roller | 3.54 | 3 | Frequent |
| African Grey Horn bill | 2.54 | 3 | Frequent |
| Double toothed Barbet | 2.98 | 3 | Frequent |
| Nubian wood pecker | 1.22 | 2 | Uncommon |
| Tawny-flanked Prinia | 2.67 | 3 | Frequent |
| Variable sunbird | 3.43 | 3 | Frequent |
| Yellow billed Oxpecker | 2.86 | 3 | Frequent |
| Superb Starling | 3.32 | 3 | Frequent |
| Red headed Weaver | 3.76 | 3 | Frequent |
| White headed buffalo Weaver | 4.09 | 3 | Frequent |
| Little Grebe | 1.54 | 2 | Uncommon |
| Black winged Stilt | 2.1 | 2 | Uncommon |
| Wood sand Piper | 0.77 | 2 | Uncommon |
| Grey Heron | 4.53 | 3 | Frequent |
| Grasshopper Warbler | 1.43 | 2 | Uncommon |

**Table 7.** Relative abundance of avian in the Bush land habitat during the wet season.

| Species | No. of individuals in 10 field hours | Abundance score | Rank |
|---|---|---|---|
| Namaqua Dove | 4.69 | 3 | Frequent |
| Black-winged Love bird | 1.41 | 2 | uncommon |
| Grey Headed Kingfisher | 4.85 | 3 | Frequent |
| African Pygmy Kingfisher | 2.97 | 3 | Frequent |
| Rufous-crowned Roller | 6.73 | 3 | Frequent |
| Village Weaver | 6.42 | 3 | Frequent |
| Little Weaver | 19.09 | 4 | common |
| White- headed Buffalo Weaver | 3.91 | 3 | Frequent |
| Red- fronted Tinker bird | 2.5 | 3 | Frequent |
| Black- throated Barbet | 3.44 | 3 | Frequent |
| Double toothed Barbet | 3.13 | 3 | Frequent |
| Eastern violet-backed Sunbird | 2.82 | 3 | Frequent |
| Yellow and Red-Barbet | 3.28 | 3 | Frequent |
| Black-headed Gonolek | 6.42 | 3 | Frequent |
| Brubru | 8.29 | 3 | Frequent |
| Shelley' starling | 6.57 | 3 | Frequent |
| Grey-backed Fiscal | 3.91 | 3 | Frequent |
| Northern Black flycatcher | 9.7 | 3 | Frequent |
| African Dusky Flycatcher | 14.39 | 4 | common |
| Crested francolin | 13.3 | 4 | common |
| White-crested Helmet shrike | 3.59 | 3 | Frequent |
| Red billed fire finch | 12.83 | 4 | common |
| Common Bulbul | 23.63 | 4 | common |
| Speckled mouse bird | 19.87 | 4 | common |
| Swainson's Sparrow | 7.67 | 3 | Frequent |
| Cardinal Wood pecker | 5.79 | 3 | Frequent |
| Abyssinian Roller | 11.42 | 4 | common |
| Lesser striped swallow | 88.11 | 5 | Abundant |

**Table 7.** Contd.

| | | | |
|---|---|---|---|
| Tawny-Eagle | 7.19 | 3 | Frequent |
| Meyer's (brown) parrot | 6.1 | 3 | Frequent |
| Blue-naped Mouse bird | 13.46 | 4 | common |
| Fork tailed Drogon | 8.14 | 3 | Frequent |
| Ring-necked Dove | 9.86 | 3 | Frequent |
| Rupp ell's long tailed starling | 12.52 | 4 | common |
| Red-billed Horn bill | 11.74 | 4 | common |
| Hooded Vulture | 7.82 | 3 | Frequent |
| Red billed ox pecker | 4.07 | 3 | Frequent |
| Long crested eagle | 2.66 | 3 | Frequent |
| Grey Heron | 7.04 | 3 | Frequent |
| Half-collared Kingfisher | 8.29 | 3 | Frequent |
| African Fish Eagle | 6.1 | 3 | Frequent |
| Shining sun bird | 5.01 | 3 | Frequent |
| Bateleur | 3.44 | 3 | Frequent |
| African paradise fly catcher | 7.35 | 3 | Frequent |
| Wire- tailed Swallow | 62.28 | 5 | Abundant |
| Dark chanting Goshawk | 4.44 | 3 | Frequent |
| Beautiful sun bird | 8.14 | 3 | Frequent |
| White -headed vulture | 6.88 | 3 | Frequent |
| Red-capped cordon-blue | 10.64 | 4 | common |
| Yellow Spotted Petronia | 13.46 | 4 | common |
| Northern-White crowned Shrike | 6.57 | 3 | Frequent |
| Emerald-spotted wood Dove | 12.21 | 4 | common |
| Helmeted Guinea fowl | 13.3 | 4 | common |
| Lappet-faced vulture | 5.95 | 3 | Frequent |
| Greater Honey Guide | .7.82 | 3 | Frequent |
| African Darter | 3.75 | 3 | Frequent |
| Black-crowned tchagra | 8.14 | 3 | Frequent |
| Little bee-eater | 7.04 | 3 | Frequent |
| Wood land kingfisher | 6.1 | 3 | Frequent |
| Breaded Woodpecker | 3.13 | 3 | Frequent |
| White-browed Coucal | 4.54 | 3 | Frequent |
| Lesser honey guide | 5.32 | 3 | Frequent |
| White-headed vulture | 2.35 | 3 | Frequent |

**Table 8.** Relative abundance of avian in the Riverine forest land habitat during wet season.

| Species | No. of individuals in 10 field hours | Abundance score | Rank |
|---|---|---|---|
| White-bellied Bustard | 3.28 | 3 | Frequent |
| Yellow-billed Stork | 14.76 | 4 | Common |
| African Mourning Dove | 13.35 | 4 | Common |
| Black winged Stilt | 14.52 | 4 | Common |
| Senegal Thick-Knee | 13.35 | 4 | Common |
| Eastern Grey plantain-eater | 5.6 | 3 | Frequent |
| Yellow bill Coucal | 9.84 | 3 | Frequent |
| African pied wagtail | 11.48 | 4 | Common |
| Black-headed Oriole | 11.71 | 4 | Frequent |
| Common Bulbul | 19.44 | 4 | Common |

**Table 8.** Contd.

| | | | |
|---|---|---|---|
| Violet Wood-hoopoe | 9.14 | 3 | Frequent |
| Cardinal Wood pecker | 5.85 | 3 | Frequent |
| Black saw-wing | 53.42 | 5 | Abundant |
| Levaillant's Cuckoo | 8.67 | 3 | Frequent |
| Black Cuckoo | 5.38 | 3 | Frequent |
| Pied king fisher | 5.15 | 3 | Frequent |
| Black-winged Love Bird | 4.45 | 3 | Frequent |
| Ring-necked Dove | 11.95 | 4 | Common |
| Tawny Eagle | 8.43 | 3 | Frequent |
| Dark chanting Goshawk | 6.56 | 3 | Frequent |
| African fish Eagle | 6.79 | 3 | Frequent |
| Hamerkop | 7.02 | 3 | Frequent |
| Reed (Long-tailed) cormorant | 10.31 | 4 | Common |
| Greater Egret | 12.42 | 4 | Common |
| African Darter | 8.67 | 3 | Frequent |
| White bellied-Go-away bird | 11.01 | 4 | Common |
| Helmeted Guinea fowl | 13.58 | 4 | Common |
| Grey Heron | 11.12 | 4 | Common |
| Woodland Kingfisher | 7.49 | 3 | Frequent |
| Striped Heron | 10.78 | 4 | Common |
| Speckled mouse bird | 8.67 | 3 | Frequent |
| African Pygmy king fisher | 9.13 | 3 | Frequent |
| African Trush | 8.9 | 3 | Frequent |
| Lesser Honey guide | 5.39 | 3 | Frequent |
| African paradise fly catcher | 17.57 | 4 | Common |
| White-backed Vulture | 10.54 | 4 | Common |
| Hooded Vulture | 5.15 | 3 | Frequent |
| Lappet-faced Vulture | 4.68 | 3 | Frequent |
| Marabou Stork | 2.34 | 3 | Frequent |

**Table 9.** Relative abundance of avian in the grass land habitat during wet season.

| Species | No. of individuals in 10 field hours | Abundance score | Rank |
|---|---|---|---|
| Northern Carmine-bee eater | 3.54 | 3 | Frequent |
| Wood sand Piper | 1.62 | 2 | Uncommon |
| Kori Bustard | 1.24 | 2 | Uncommon |
| Egyptian Goose | 3.16 | 3 | Frequent |
| Little Grebe | 1.82 | 2 | Uncommon |
| Spur winged Plover | 4.31 | 3 | Frequent |
| Sacred Ibis | 2.39 | 3 | Frequent |
| Black winged Stilt | 1.91 | 2 | Uncommon |
| White-bellied Bustard | 0.95 | 2 | Uncommon |
| Lesser honey guide | 2.87 | 3 | Frequent |
| Common ostrich | 3.26 | 3 | Frequent |
| White-backed vulture | 3.64 | 3 | Frequent |
| Lappet-faced vulture | 1.19 | 2 | Uncommon |
| Hooded vulture | 1.53 | 2 | Uncommon |
| Black-crowned Tchagra | 2.68 | 3 | Frequent |
| Jackson's Horn bill | 3.64 | 3 | Frequent |

**Table 9.** Contd.

| | | | |
|---|---|---|---|
| African Grey Horn bill | 2.68 | 3 | Frequent |
| Red headed Weaver | 4.31 | 3 | Frequent |
| White headed buffalo Weaver | 3.83 | 3 | Frequent |
| Yellow billed kite | 1.91 | 2 | Uncommon |
| Gabar Goshawk | 1.53 | 2 | Uncommon |
| Dark chanting Goshawk | 2.11 | 3 | Frequent |
| African Harrier Hawk | 2.29 | 3 | Frequent |
| Cattle Egret | 4.31 | 3 | Frequent |
| Pearl-spotted Owlet | 2.11 | 3 | Frequent |
| Tawny Eagle | 1.91 | 3 | Frequent |
| Marabou Stork | 2.68 | 3 | Frequent |
| Brue's Green Pigeon | 0.67 | 2 | Uncommon |
| Yellow billed Oxpecker | 2.58 | 3 | Frequent |
| Rufous-crowned Roller | 4.98 | 3 | Frequent |
| Double toothed Barbet | 2.68 | 3 | Frequent |
| Superb Starling | 3.74 | 3 | Frequent |
| Abyssinian Ground horn bill | 3.35 | 3 | Frequent |
| Nubian wood pecker | 1.43 | 2 | Uncommon |
| Little-bee eater | 3.25 | 3 | Frequent |
| Tawny-flanked Prinia | 2.68 | 3 | Frequent |
| Blue-naped Mouse bird | 6.42 | 3 | Frequent |
| Laughing Dove | 4.79 | 3 | Frequent |
| Abyssinia Roller | 4.98 | 3 | Frequent |
| African pied wagtail | 6.42 | 3 | Frequent |
| Brown-Snake Eagle | 1.44 | 2 | Uncommon |
| Bateleur | 4.02 | 3 | Frequent |
| Verreaux's Eagle-Owl | 1.72 | 2 | Uncommon |
| Grass land Pipit | 3.54 | 3 | Frequent |

should be interpreted in the ground practically and used for better conservation of biodiversity.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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