

# ABUNDANCE AND DIVERSITY OF BIRDS IN THE OGBESE FOREST RESERVE, EKITI STATE, NIGERIA.

## Abstract.

*A study was carried out to evaluate the species composition and relative abundance of bird species of the natural and plantation forest of Ogbese Forest Reserve, Ekiti State. The study was conducted from April, 2010 to February, 2011 covering both wet and dry seasons. Sample sites were stratified based on the vegetation types and transect count techniques was employed for the evaluation. A total of 52 bird species consisting of 47 resident and 5 immigrant species was recorded. The species composition of birds during the wet and dry seasons was not significantly different. The natural forest vegetation had the highest species diversity and evenness. The relative abundance score of species during the Wet and dry seasons was variable in both habitats.*

Key words: Vegetation, Diversity, Abundance, Immigrants, Birds

## Introduction

Ogbese Forest Reserve, Ekiti State, Nigeria is an artificial planted forest of the former Ondo State Forestry Department. The forest reserve covers a land mass of 72 km<sup>2</sup> consisting of 27km<sup>2</sup> as forest, 16 km<sup>2</sup> savanna, 14 km<sup>2</sup> fresh water swamp forest and 10 km<sup>2</sup> as disturbed land. The plantation site of the reserve is 5 km<sup>2</sup> comprising of 4 km<sup>2</sup> of *Tectona grandis* and 1 km<sup>2</sup> of *Gmelina arborea*. The forest vegetation of the reserve constitutes 37.5% of the total land mass with pre-dominant tree species: *Enantia cholarentha*, *Cleistophols patens*,

27 *Barteria nigritana, Cola acuminata, Parinari congesis, Milicia excelsa, Ickaya senegalensis,*  
28 *Albizia zygia, Terminalia superba* and herbaceous species. The deciduous tree species  
29 provide the nesting sites for bird species inhabiting the area. The River Ogbese flows through  
30 the major part of the reserve and has pronounced impact on the vegetation. Annual rainfall  
31 varies from 1250 mm to 1400 mm, mean temperature varies from 21<sup>0</sup>C to 25<sup>0</sup>C and humidity  
32 is 75%. The taxonomic studies of tree species in Ogbese Forest Reserve, Ekiti State Nigeria,  
33 has been described in few studies focusing on its diversity as well as its conservation, but  
34 relevant information is completely lacking on the avifauna diversity of this reserve. The  
35 objectives of the study were to establish the diversity of avifauna species inhabiting the  
36 varying vegetation types in Ogbese Forest Reserve in Ekiti State so as to create the awareness  
37 towards biological conservation of birds in the area.

## 38 **Materials and Methods**

### 39 **Study Area**

40

41 The study was carried out in Ogbese Forest Reserve, Ekiti State, Nigeria. The reserve  
42 is located within the tropics and lies between latitude 50<sup>0</sup> 32' and 40<sup>0</sup> 27' North and longitude  
43 70<sup>0</sup> 50' and 90<sup>0</sup> 28' East. The prevailing climate is tropical with an average temperature of  
44 25<sup>0</sup>C all year round and high relative humidity. The rainy season has an average of 240 days  
45 with mean annual rainfall of 1250 to 1400 mm. The pattern of rainfall distribution is bimodal  
46 with a long rainy season between April and mid- November with a peak in September while  
47 the dry season stretches from mid- November to the end of March. The total land mass of the  
48 reserve is about 72.52km<sup>2</sup> out of which 27 km<sup>2</sup> is of pure forest stand, 16 km<sup>2</sup> is savannah,  
49 14 km<sup>2</sup> is swamp forest and 10.52 km<sup>2</sup> is a disturbed land. The plantation site of the reserve is  
50 5 km<sup>2</sup> comprising 4 km<sup>2</sup> of *Tectona grandis* and 1 km<sup>2</sup> *Gmelina arborea*.

### 51 **Birds Assessment**

52 A preliminary survey was conducted in April, 2010, for familiarization with the bird  
53 community and habitat types. The coordinates of the site were taken and the plots delineated.  
54 The study was conducted from April, 2010 to February, 2011, covering both wet and dry  
55 seasons. A survey of abundance and diversity of Avifauna species of the Ogbese Forest  
56 Reserve, Ekiti State was conducted from twenty (20) plots distributed in 72.52 km<sup>2</sup> area using  
57 transect count method as described by Burnham *et al.* (1980). The stratified random sampling  
58 technique (Thakur *et al.*; 2003) was adopted for studying the birds of the area, which involved  
59 dividing the sites into different strata based on vegetation types. The relative value of each  
60 vegetation type for attracting different bird species was determined by the establishment of  
61 0.5 km long transect in each of the four (4) plots located in each of the identified five  
62 vegetation types. Birds were observed by walking along the transects for three consecutive  
63 days in a month for the duration of twelve months. Data collection commenced about 30  
64 minutes after dawn and was carried out for five hours at 6:30 – 10:00 and 16:30 – 18:00 daily  
65 that correspond to periods of prominent bird activities (Jones,1998).In order to avoid repeated  
66 counting of birds, transects were reasonably spaced at least 200 m apart. A record was made  
67 of all the types and group number of bird species through direct observation with binoculars  
68 (Olympus 10 x 42) and identified to the species level and taxonomic groups categorized  
69 based on Field Guides to Birds of Western Africa (Borrow and Demey, 2004) and Field  
70 Guides to Birds of Africa (Mackworth – Praed and Grant, 1970). Other materials used were  
71 Compass equipped with a sighting mirror and Global Positioning System (GPS).

## 72 **Data Analysis**

73 The cumulative list of bird species recorded in each of the five forest types of Ogbese  
74 forest reserve was used as a basic measure of avian richness. The relative abundance of avian  
75 species was determined using encounter rate that gives crude ordinal scales of abundance:  
76 abundant, common, common uncommon and rare (Bibby *et al.*; 1998). The encounter rate

77 incorporates the field hours of observation and the number of individuals of each species  
 78 observed. This allows the encounter rate to be calculated for each species by dividing the  
 79 number of birds recorded by the number of hours spent searching, giving a figure of birds per  
 80 hour for each species. The abundance categories  $\leq 1.0$ , (rare) 1.1 – 2.0, (uncommon) 2.1 –  
 81 10.0, (fairly common) 10.1 – 40.0 (common) and  $>40$  birds. Diversity was calculated using  
 82 both Shannon-Weiner and Simpson's diversity indices. Shannon – Weiner diversity index 'H'  
 83 was calculated using formula:

$$84 \quad H' = - \sum p_i \ln p_i$$

85 where,  $p_i$  = proportion of individual species and  $R$  = total – number of species of observed

86 Simpson's diversity index 'D' was calculated using the formula:


$$87 \quad D = \frac{\sum n_i (n_i - 1)}{N (N - 1)}$$


89 Where  $n_i$  = total number of birds of each individual – species and  $N$  = the total number of  
 90 birds of all species. The value  $D$  ranges between 0 and 1 with this – index, 1 represents  
 91 infinite diversity and 0, no diversity. One way analysis of variance (ANOVA) was used for  
 92 analyze the variation in birds composition between the vegetation types with the General  
 93 Linear Model (GLM) procedure of SAS (2000) package.


94 Differences were considered statistically significant at 5% level. The data were further  
 95 subjected to detailed analysis to determine species richness index, species evenness index,  
 96 Sorensen index of similarity, Margalef diversity index, and Simpson's index (Margalef  
 97 1968). **Results**

98 Fifty-two (52) bird species belonging to eleven (11) Orders and twenty two (22)  
 99 families were recorded during the two seasons viz wet and dry in the five vegetation types of  
 100 Ogbese Forest Reserve out of which forty (40) were non- passerine and ten (10) were  
 101 passerine species (Table 1). The natural forest vegetation type contains the highest number of


102 bird species than the plantation vegetation type in both seasons. The higher numbers of birds:  
103 49 and 47 were recorded in the natural forest vegetation in both the wet and dry seasons  
104 respectively out of which 45 bird species were residents and 7 species were migratory. Also  
105 36 and 37 bird species were obtained in the plantation vegetation in both seasons out of  
106 which 33 were residents and 7 species were migratory, (Table 2 and 3). Most of the migratory  
107 bird species were observed from November, 2010 to February, 2011 in both the natural and  
108 plantation forest vegetation. The Order Passeriformes constituted the predominant group,  
109 representing 27.3% of families (n=6) and 20% of species (n=10). The families with the  
110 largest number of species were Ardeidae (n=6), Accipitridae (n=5) and Columbidae (n=5).  
111 The bird species were distributed within the natural forest and plantation ecosystems in  
112 Ogbese Forest Reserve.

113 In each season, 49 bird species were recorded and (47) bird species were common to  
114 both seasons while 2 and 3 species were exclusive to the wet and dry seasons respectively.  
115 Also 12 bird species were exclusive inhabitants of the natural forest while no exclusive  
116 species was recorded in the plantation forest (Table 3). The species composition of birds  
117 during the wet and dry seasons was not significantly different ( $P>0.05$ ) but there was a  
118 significant difference among the two major vegetation types 

119 The highest species diversity during the wet season was observed in natural forest  
120 vegetation (3.63) while the plantation vegetation had a lower species diversity (5.39).  During  
121 the dry season, the species diversity in the natural forest vegetation and plantation vegetation  
122 was 3.67 and 3.34 respectively. The higher species evenness was registered in the natural  
123 forest vegetation in both the wet and dry seasons (Table 2).

124 Table  Avian Distribution of Natural and Artificial forests of Ogbese Forest Reserve,  
 125 Ekiti State.

126

S/N	SPECIES SCIENTIFIC NAME 	ORDER	FAMILY
1.	Little Egret <i>Egretta gazetta</i>	Ciconiiformes	Ardeidae
2.	Cattle Egret <i>Bubulcus ibis</i>	Ciconiiformes	Ardeidae
3.	Great Egret <i>Ardea alba</i>	Ciconiiformes	Ardeidae
4.	Goliath Heron <i>Ardea goliath</i>	Ciconiiformes	Ardeidae
5.	Grey Heron <i>Ardea Cinerea</i>	Ciconiiformes	Ardeidae
6.	Dwarf Bittern <i>Ixobrychus sturmii</i>	Ciconiiformes	Ardeidae
7.	Wooly – necked Stork <i>Ciconia episcopus</i>	Ciconiiformes	Ciconiidae
8.	Yellow – billed Stork <i>Mycteria ibis</i>	Ciconiiformes	Ciconiidae
9.	African Black kite <i>Milvus migrans</i>	Falconiformes	Accipitridae
10.	African harrier hawk <i>Polyboroides typus</i>	Falconiformes	Accipitridae
11.	Lizard Buzzard <i>Katpifalco monogrammicus</i>	Falconiformes	Accipitridae
12.	Shikra <i>Accipiter badius</i>	Falconiformes	Accipitridae
13.	Grasshopper buzzard <i>Buteo buteo</i>	Falconiformes	Accipitridae
14.	Lesser kestrel <i>falco naumanni</i>	Falconiformes	Falconidae
15.	Scaly francolin <i>francolinus squamatus</i>	Galliformes	Phasianidae
16.	Double spurred francolin <i>francolinus bicalcaratus</i>	Galliformes	Phasianidae
17.	Forest – francolin <i>francolinus lathami</i>	Galliformes	Phasianidae
18.	Crested Guinea fowl <i>Guttera pucherani</i>	Galliformes	Numididae
19.	Common sandpiper <i>Actitis hypoleucos</i>	Charadriiformes	Scolopacidae
20.	Chestnut – bellied Sandgrouse <i>Pterocles exustus</i>	Pterocliiformes	Pteroclididae
21.	Lemon dove <i>Columba larvata</i>	Columbiformes	Columbidae
22.	Laughing Dove <i>Streptopelia senegalensis</i>	Columbiformes	Columbidae
23.	African Green Pigeon <i>Treron Calva</i>	Columbiformes	Columbidae
24.	Tambourine dove <i>Turtur tympanistris</i>	Columbiformes	Columbidae
25.	Mourning collared Dove <i>Streptopelia decipiens</i>	Columbiformes	Columbidae
26.	Senegal coucal <i>Centropus senegalensis</i>	Cuculiformes	Cuculidae

27.	Common cuckoo <i>Cuculus canorus</i>	Cuculiformes	Cuculidae
28.	African cuckoo <i>Cuculus gularis</i>	Cuculiformes	Cuculidae
29.	Black coucal <i>Centropus grillii</i>	Cuculiformes	Cuculidae
30.	Little swift <i>Apus affinis</i>	Apodiformes	Apodidae
31.	Common swift <i>Apus apus</i>	Apodiformes	Apodidae
32.	African palm-swift <i>Cypsiurus parvus</i>	Apodiformes	Apodidae
33.	African pygmy – king fisher <i>Ispidina picta</i>	Coraciiformes	Alcedinidae
34.	Dwarf kingfisher <i>Ispidina lecontei</i>	Coraciiformes	Alcedinidae
35.	African Grey hornbill <i>Tockus nasutus</i>	Coraciiformes	Alcedinidae
36.	Black casqued hornbill <i>Ceratogymna atrata</i>	Coraciiformes	Bucerotidae
37.	African pied hornbill <i>Tockus fasciatus</i>	Coraciiformes	Bucerotidae
38.	Lesser honey guide <i>Indicator minor</i>	Piciformes	Indicatoridae
39.	Spotted Honey guide <i>Indicator maculatus</i>	Piciformes	Indicatoridae
40.	Fire-bellied wood pecker <i>Dendropicos</i> <i>Pyrrhogaster</i>	Piciformes	Picidae
41.	Black – headed weaver <i>Ploceus cucullatus</i>	Passeriformes	Ploceidae
42.	Slender-billed weaver <i>ploceus pelzelni</i>	Passeriformes	Ploceidae
43.	Grey wood pecker <i>dendropicous goetae</i>	Piciformes	Picidae
44.	Mosque swallow <i>Cecropis daurica</i>	Passeriformes	Hirundinidae
45.	African pied wagtail <i>Motacilla aguimp</i>	Passeriformes	Motacillidae
46.	Ethiopian swallow <i>Hirundo aethiopita</i>	Passeriformes	Laniidae
47.	Pied crow ( <i>Corvus albus</i> )	Passeriformes	Corvidae
48.	Little bee eater ( <i>Merops pusillus</i> )	Coraciiformes	Meropidae
49.	Olive – bellied sunbird ( <i>Nectarinia</i> <i>chloropygius</i> )	Passeriformes	Nectariniidae
50.	Superb sunbird ( <i>Nectarinia superba</i> )	Passeriformes	Nectariniidae
51.	Olive sunbird ( <i>Nectarinia olivacea</i> )	Passeriformes	Nectariniidae
52.	Pin tailed whydah ( <i>Vidua chalbeata</i> )	Passeriformes	Ploceidae

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127 **Table 2: Avian Species Diversity during Wet and Dry Seasons.**

Vegetation	Season	No of species	Abundance (No of Individuals)	D	H	H /Hmax
Natural forest	Wet	49	234	0.96	3.63	0.83
	Dry	47	597	0.97	3.67	0.84
Plantation	Both	52	831			
	Wet	36	240	0.96	3.39	0.77
	Dry	37	135	0.95	3.34	0.76
	Both	40	375			

128  $H^1$  – Shannon–Wiener Index, D = Diversity Index,  $H^1/H^1max = Evenness$   $H^1max = \ln(s)$ .

129

130 **Table 3. Status of bird species in the natural and plantation forest of Ogbese Forest Reserve**

FT	NR	NI	TS	NEBS	NWEBS	NDEBS
Natural Forest	45	07	52	12	02	03
Plantation Forest	33	07	40	0	-	-

131 FT= Forest types, NR= Number of residents, NI=Number of immigrants, TS=Total Species,  
 132 NEBS= Number of Exclusive bird species, NWEBS= Number of Wet season Exclusive bird  
 133 species, NDEBS= Number of Dry season Exclusive bird species

134

135 The relative abundance scores of species during the wet season showed that 6 and 2 species  
 136 were frequent, 5 and 1 were common, 7 and 4 were uncommon, 23 and 10 were rare while 4  
 137 and 1 were abundant in the natural and plantation vegetation respectively. During the dry  
 138 season 10 and 3 species were frequent, 5 and 2 were common, 3 and 4 were uncommon, 12  
 139 and 10 were rare while 5 and 4 were abundant in the natural and plantation vegetation  
 140 respectively (Table 4).



141 **Table 4: Number of bird species in different relative abundance categories.**

Vegetation	Season	Frequent	Common	Uncommon	Rare	Abundance
Natural	Wet	06	05	07	23	04
	Dry	10	05	03	12	05
Plantation	Wet	02	01	04	10	01
	Dry	03	02	04	10	04

142

143 **Discussion**

144 The record of fifty two (52) bird species observed during wet and dry seasons in the  
 145 limited area shows that the diversity is very high. The occurrence of high number of resident  
 146 bird species in the area indicates that the area could provide the necessary requirements for  
 147 resident bird species.

148 The species composition of birds counted during the wet and dry seasons of the study  
 149 was not significantly different. The extended time of inundation of the area during the wet  
 150 and dry seasons could contribute to the insignificant effect of seasons on bird species  
 151 composition in the study areas. Ward (1969) asserted that bird species shift their feeding  
 152 habit between seasons in temperate habitats and this may likely be responsible for the  
 153 insignificant effect of seasons on bird species composition in the present study.

154 The species diversity index and evenness of both the natural forest and forest  
 155 plantation during the entire season revealed that the natural forest vegetation had the higher  
 156 species diversity and evenness. The species diversity of flora in the natural forest compared  
 157 to the plantation forest might play a determinative role in the higher diversity and evenness  
 158 recorded. This may be as a result of the presence of multiple and variety of alternative feed

159 sources for birds. In addition, natural forest vegetation community which has been for  
 160 reasonable number of years without disturbance is more diverse and comprises of various  
 161 plant species and life forms which provide better food, cover, breeding and nesting sites  
 162 could have contributed to high species diversity and evenness in the natural forest vegetation.

163 On the other hand, plantation forests are in some areas fragmented, exposed to agroforestry  
164 practices and tree species exploitation. In view of this, birds which inhabit this habitat are  
165 affected. Rana (2005) was of the opinion that pristine natural habitats properly preserved  
166 from human interference are of higher diversity and evenness of species than the fragmented  
167 areas where anthropological activities takes place. Variations that exist in feeding habits and  
168 habitats might also contribute towards the increment of diversity, evenness and species  
169 richness (Smith, 1992).

170 The unregulated anthropogenic disturbances impact negatively on the plantation forest  
171 habitats and this might have been responsible for low evenness and species diversity  
172 experienced in the plantation forest vegetation types during both the wet and dry seasons. The  
173 relative abundance of individual bird species during the seasons might be dictated by the  
174 availability of food, habitat physiognomy and breeding season of the species. Lee and  
175 Rotenberry (2005) asserted that the distribution and abundance of many bird species are  
176 influenced by the composition and structure of the vegetation community that serves as cover  
177 to bird species. As vegetation structure changes, a particular bird species may subsist. Human  
178 activities which are more pronounced in the plantation forest of Ogbese Forest Reserve might  
179 be responsible for the lower number of bird species recorded in the vegetation types during  
180 both dry and wet seasons of the study year. Human activities threaten the existence of many  
181 birds by altering the vegetation structure of their habitats and thereby impeding their  
182 reproductive success (Green and Hirons 1991). The intensive timber logging activities and  
183 agroforestry practices in the plantation forest are major factors that affect bird species  
184 richness.

## 185 **Conclusion**

186 The result of this study has shown that the natural and plantation vegetation types of Ogbese  
187 Forest Reserve, Ekiti State considered in this study are not similar in bird species diversity,

188 evenness and abundance. The heterogeneity of flora species in the natural forest compared to  
 189 the plantation forest might be responsible for the variation. The management of birds in the  
 190 reserve should take cognizance of the vegetation types for effective conservation of bird  
 191 species which are resident in the reserve. Flora species richness favours higher diversity and  
 192 abundance of bird life and management measures that aim at increasing flora composition  
 193 might help in the maintenance of healthy bird population



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226 est is a major factor that might affects bird species richness.

227

228 **Appendix 1. Total number of bird species observed during the wet and dry seasons in**  
229 **natural forest.** 

S/N	SPECIES SCIENTIFIC NAME	WET	DRY
1.	Little Egret <i>Egretta gazetta</i>	22	19
2.	Cattle Egret <i>Bubulcus ibis</i>	34	36
3.	Great Egret <i>Ardea alba</i>	14	12
4.	Goliath Heron <i>Ardea goliath</i>	09	07
5.	Grey Heron <i>Ardea Cinerea</i>	-	04
6.	Dwarf Bittern <i>Ixobrychus sturmii</i>	06	07
7.	Wooly – necked stor <i>Ciconia episcopus</i>	04	-
8.	Yellow – billed stor <i>Myeteria ibis</i>	12	10
9.	African black kite <i>Milvus migrans</i>	-	44
10.	African hafier hawk <i>Polyboroides typus</i>	05	08
11.	Lizard Buzzard <i>Katpifalco monogrammicus</i>	06	06
12.	Shikra <i>Accipiten badius</i>	06	05
13.	Grasshopper buzzard <i>Buteo butco</i>	07	-
14.	Lesser kestrel <i>falco naumanni</i>	07	06
15.	Scaly francolin <i>francolinus squamatus</i>	28	30
16.	Double spurred francolin <i>francolinus bicalcaratus</i>	05	07
17.	Forest – francolin <i>francolinus lathamii</i>	24	19
18.	Crested Guinea fowl <i>Guttera pucherani</i>	20	22
19.	Common sandpiper <i>Actitis hypoleucos</i>	07	-
20.	Chestnut – bellied sandgrouse <i>pteroeles exustus</i>	-	10
21.	Lemon dove <i>Columba larvata</i>	11	17
22.	Laughing Dove <i>Streptopelia enegalensis</i>	16	14
23.	African Green Pigeon <i>Treron Calva</i>	06	08

24.	Tambourine dove <i>Turtur tympanistria</i>	08	13
25.	Mourning collared Dove <i>Streptopelia decipiens</i>	13	11
26.	Senegal coucal <i>centropus enegalensis</i>	08	08
27.	Common cuckoo <i>Cuculus canorus</i>	10	12
28.	African cuckoo <i>Cuculus gularis</i>	13	09
29.	Black coucal <i>Centropus grillii</i>	07	05
30.	Little swift <i>Apus affinis</i>	16	10
31.	Common swift <i>Apus apus</i>	06	05
32.	African palm-swift <i>Cypsiurus parus</i>	20	24
33.	African pygmy – king fisher <i>Ispidina picta</i>	10	05
34.	Dwarf kingfisher <i>Ispidina lecontei</i>	14	17
35.	African Grey hornbill <i>Tockus nasutus</i>	05	07
36.	Black casqued hornbill <i>Ceratogymna atrata</i>	09	06
37.	African pied hornbill <i>Tockus fasciatus</i>	10	12
38.	Lesser honey guide <i>Indicator minor</i>	05	07
39.	Spotted Honey guide <i>Indicator maculates</i>	08	10
40.	Fire-bellied wood pecker <i>Dendropicus Pyrrhogaster</i>	09	12
41.	Black – headed weaver <i>Ploceus cucullatus</i>	23	22
42.	Slender-billed weaver <i>Ploceus pelzelni</i>	81	21
43.	Grey wood pecker <i>Dendropicus goetae</i>	09	08
44.	Mosque swallow <i>Cecropis daurica</i>	19	17
45.	African pied wagtail <i>Motacilla aguimp</i>	10	12
46.	Ethiopian swallow <i>Hirundo aethiopita</i>	07	-
47.	Pied crow ( <i>Corvus albus</i> )	20	21
48.	Little bee eater ( <i>Merops pusillus</i> )	11	08
49.	Olive – bellied sunbird ( <i>Nectarinia chloropygius</i> )	8	10
50.	Superb sunbird ( <i>Nectarinia superba</i> )	08	06
51.	Olive sunbird ( <i>Nectarinia olivacea</i> )	08	07
52.	Pin failed why dah ( <i>Vidua chalybeata</i> )	10	-

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232

233 **Appendix 2. Total number of bird species observed during the wet and dry seasons in**  
 234 **plantation forest**

S/N	SPECIES SCIENTIFIC NAME	WET	DRY
1.	Little Egret <i>Egretta gazetta</i>	25	17
2.	Cattle Egret <i>Bubulcus ibis</i>	27	28
3.	Great Egret <i>Ardea alba</i>	15	14
4.	Grey Heron <i>Ardea Cinerea</i>	-	08
5.	Dwarf Bittern <i>Ixobrychus sturmii</i>	07	05
6.	Woolly – Necked stock <i>Ciconia episcopus</i>	02	04
7.	Yellow – billed stock <i>Myeteria ibis</i>	03	03
8.	African black kite <i>Milvus migrans</i>	-	67
9.	Lizard Buzzard <i>Katpifalco monogrammicus</i>	06	05
10.	Shikra <i>Accipiten badius</i>	05	04
11.	Grasshopper buzzard <i>Buteo butco</i>	05	-
12.	Lesser kestrel falco naumanni	06	08
13.	Scaly francolin francolinus squamatus	32	35
14.	Common sandpiper <i>Actitus hypoleucos</i>	05	04
15.	Chestnut – bellied sandgrouse <i>pteroles exustus</i>	-	05
16.	Lemon dove <i>Columba larvata</i>	11	10
17.	Laughing Dove <i>Streptopelia senegalensis</i>	13	15
18.	African Green Pigeon <i>Treron Calva</i>	12	15
19.	Tambourine dove <i>Turtur tympanistria</i>	9	08
20.	Mourning collared Dove <i>Streptopelia decipiens</i>	14	16
21.	Senegal coucal <i>centropus senegalensis</i>	10	08
22.	Common cuckoo <i>Cuculus canorus</i>	07	08
23.	African cuckoo <i>Cuculus canorus</i>	07	06
24.	Little swift <i>Apus affinis</i>	24	21
25.	Common swift	14	15
26.	African pygimy – king fisher <i>Ispidina picta</i>	09	11
27.	Dwarf kingfisher <i>Ispidina lecontei</i>	10	11
28.	African Grey hornbill <i>Tockus nasutus</i>	07	07
29.	African pied hornbill <i>Tockus fasciatus</i>	09	08

30.	Spotted Honey guide <i>Indicator maculatus</i>	12	11
31.	Fire-bellied wood pecker <i>Dendropicus Pyrrhogaster</i>	05	07
32.	Black – headed weaver <i>Ploceus cucullatus</i>	23	30
33.	Slender-billed weaver <i>Ploceus pelzelni</i>	36	21
34.	African pied wagtail <i>Motacilla aguimp</i>	12	10
35.	Ethiopian swallow <i>Hirundo aethiops</i>	12	-
36.	Pied crow ( <i>Corvus albus</i> )	16	17
37.	Olive – bellied sunbird ( <i>Nectarinia chloropygius</i> )	-	12
38.	Superb sunbird ( <i>Nectarinia superba</i> )	07	07
39.	Olive sunbird ( <i>Nectarinia olivacea</i> )	08	07
40.	Pin tailed whydah ( <i>Vidua chalybeata</i> )	11	-