

Abundance and distribution of Birds in Dinder National Park, Sudan

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Abstract: This study was conducted in Dinder National Park (DNP) during the dry season of 2011, (January-May). The main purpose of the study was to determine the distribution and abundance of birds in DNP. In total 13,695 birds were counted in five Mayas, belonging to 56 species. The results showed significant differences between five Mayas ($P < 0.01$). The distribution of birds in DNP mainly depends on the availability of water and food.

Keywords: Biosphere reserve, birds, Dinder national park, ecological zones, Sudano-Sahelian

INTRODUCTION

The Dinder National Park (DNP) was established in 1935 following the London Convention of 1933. In 1979 it was designated as Biosphere Reserve, one of only two in the Sudan. The global significance of the DNP is that it falls between two important ecological zones; the Sudano-Sahelian and the Ethiopian. The DNP was designated as a Ramsar site in 2001. The Mayas are oxbow lakes along the meandering rivers; they are subject to floods and contain green fodder and water up to the end of the dry season. The National Park supports 27 species of mammals, more than 160 species of birds and 32 species of fishes, reptiles and amphibians. There are about 58 species of shrubs and trees (HCENR, 2001). Hashim and Nimir (1979) observed that there had been fluctuations in the structure and densities of animals in the DNP in the previous years; these fluctuations were attributed to habitat deterioration, poaching and anthropogenic activities. As human population has increased, demand for food also has increased, that has exerted pressure on the land and its resources. Protected Areas focusing on conservation of wildlife and the ecosystems in Sudan include biosphere reserves, national parks, game reserves and wildlife sanctuaries. In 1983, 52 major wildlife species were reported from northern Sudan while in 1991 a list of 83 species were produced. Major wildlife species were distributed in 19 protected areas all over Sudan. The major fauna reported from Dinder National Park are: 27 mammals, several species of small mammals; partial summer lists of 115 birds, 14 snakes and scorpions, 108 species of insects and 26 fish species. Forty nine common tree species and shrubs (of which eight are endangered) and 195 common herbaceous plants have been identified (GOS and HCENR 2006). Dinder National Park supports a large population of animals during

the dry season and the lesser number during the wet season (Dasmann, 1972). A systemic animal census had been conducted by Minga (1971) on nine of the principal Mayas; he counted a total of 5613 large game animals during the period March to April 1971. Dasmann (1972) used aerial counts in August, reported 49 animals outside the park including reedbuck (*Redunca arundinum*), roan antelope (*Hippotragus equinus*), and ostrich (*Struthio camelus*); even though animal sighting was difficult because of the dense wooded vegetation. Dropping counts and road counts of the large herbivores conducted by Wildlife Research Center (WRC) in most of the principal Mayas during 1971-1994. Hameed (1994) observed that generally there was a declining trend in the total number of animals using the Mayas.

Study Area

Dinder National Park in south eastern Sudan is located between latitude 12° N and 13° N and longitude 34° E and 35° E, covering an area of 10,291.88 km². The DNP area is generally a flat plain with occasional isolated hills occurring at its southern portion. Dinder, Rahad and Galagu are principal seasonal rivers that descend from the Ethiopian highlands and drain the DNP during the rainy season. There are also many smaller subsidiary streams that wind through the park to join one or any of the three rivers. The DNP was inhabited by people until 1880 when disease and famine drastically reduced the human population. When the park was established in 1935; it was very sparsely populated with humans (Holsworth, 1968).

Climate

The climatic conditions of DNP in general, can be summarized as cool and dry in winter and wet and warm in summer. The wet season starts in May and ends in November, during which the area receives an annual rainfall ranging between 600 and 1000 mm. The annual

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mean relative humidity varies between 35-45% but higher value of 79% has also been recorded during the peak of the rainy season in August (Dai, 1982).

Topography and Soil

According to Holsworth (1968) and Dasmann (1972) two types of soils are available in DNP: the vertisols and entisols. The former, the most extensive in the park, are dark, heavy clayee (self-ploughing) soils often known as the black cotton soil. They crack deeply during the early dry season. The entisols dominate the eastern limits of the park towards the foothills of the Ethiopian plateau and along riverbanks. This soil type occurs in patches of sandy loam and sandy clay. They intersperse with the vertisols.

Vegetation ecosystem

Holsworth (1968) and Hakim *et al.* (1978) classified the vegetation of the DNP in three types:

1. Woody grassland

The *Acacia seyal*-*Balanites* ecosystem is woodland or woody grassland, dominated by species of *Acacia seyal*, *Balanites aegyptica*, and *Combretum hartmannianum*. This ecosystem occurs extensively on deep, cracking clay soils (vertisols).

2. Riverine forests

Riverine forests occur on the banks of Dinder and Rahad rivers. The forest is a multi-layered vegetation, dominated by *Hypheana thebaica* (Dom), *Acacia nilotica* (Sunt), *Ziziphus spina Christi* (Siddir).

Maya wetlands

Mayas are wetlands (Meadows) found along the flooded plains of rivers. They have been formed due to the meandering character of the channel and nature of flows of their waters. They occupy low lying basins, meanders and oxbows. Mayas are the major parts of water courses that have been separated as Oxbow lakes and depressions that get filled during the rainy season by rains or flood waters.

Fauna

Dinder national park was reported to have a variety of wildlife species in the past. Some of these animals migrate to wet season habitat outside the boundaries of the park. The season for these migrations is not yet known.

Birds

Common birds in the park include; Ostrich (*Struthio camelus camelus*), Egyptian goose (*Alopchen aegyptiacus*), Helmeted Guinea fowl (*Numida meleagris*), Sacred ibis (*Threskiornis aethiopicus*),

Pink-backed pelican (*Pelecanuse rufescens*), Marabu stork (*Leptoptilos crumeniferus*), Namaqua dove (*Oena capensis*), Blue-eared glossy starling (*Lamprotornis chalybacus*) and Red-billed quelea (*Quelea quelea*).

MATERIALS & METHODS

Wildlife species

The field study was conducted in the dry season of 2011 in DNP. Direct observation technique was used for estimating the number of birds and their distribution in Mayas and pools.

Direct observation

Total number of pools and Mayas were visited. The selection of pools and Mayas depended on the availability of water and forage throughout the study period. The following pools and Mayas were covered; Ras Amir, Beit elwahsh, Abd elghani, Gerirrisa and Berkat eltamaseeh. Counting started early in the morning and ended in the late evening. Three assumptions were considered:

1. All birds were inside the park and used the Mayas every day.
2. Each Maya had its own bird fauna and the birds would not migrate to other Maya during the study period.
3. Habitat conditions were the same around all wetland areas.

Data collected by direct observation were used to describe the distribution of bird species in the park in the dry season.

Bird count

Birds of different species were counted (following Pomeroy, 1992) in Ras Amir, Beit elwahsh, Abd elghani, Grireesa and Berkat eltamsah. A pair of binoculars 10×50 was used to observe the birds. For two (2) hours; every 10 minutes number of birds of each species sighted were counted as scores (×), while perching on tress or flying overhead. Frequency of sighting of each species was also determined (Table 1).

RESULTS

The total number of birds observed in Dinder National Park in Mayas was 13,651, belonging to 56 different species, 24 families, most of the families are represented by one genus; Anatidae was represented by four genera; three families Ardeidae, Scopidae and Ploceidae were represented by six genera each (Table 2).

It is clear that Dinder National Park still has natural resources in good condition. In the present study distribution of birds in DNP depends on availability of water and food.

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Table 1: Frequency of Bird species in five Mayas in DNP

Birds	Mayas					Total
	RasAmir	Beitelwahsh	Abdelghani	Gerirrisa	Berkateltomsah	
No. of Species	54	33	39	16	40	182
Frequency	0.3	0.2	0.2	0.1	0.2	1
Percentage	30%	20%	20%	10%	20%	100%

Table 2: Number of Birds in Mayas in Dinder National Park RasAmir (A), Beitelwahsh (B), Abdelghani (C), Gerirrisa (D), Berkateltomsah (E)

S.No.	English / Local name	Scientific name	A	B	C	D	E	Total
Order Struthioniformes								
Family struthionidae								
1	Ostrich	<i>Struthio camelus</i>	12	270	5	8	0	295
Order Pelecaniformes								
Family Phalacrocoracidae								
2	Pink-backed pelican	<i>Pelecanuse rufescens</i>	20	255	637	0	0	912
Order Ciconiiformes								
Family Ardeidae								
3	Grey heron	<i>Ardea cinerea</i>	23	15	16	3	24	81
4	Black-headed heron	<i>Ardea melanocephala</i>	14	3	14	13	18	82
5	Squacco heron	<i>Ardeola ralloides</i>	3	0	2	0	5	10
6	Cattle egret	<i>Bubulcus ibis</i>	299	498	199	0	17	1013
7	Little egret	<i>Egretta garzetta</i>	50	34	28	0	0	112
8	Purple heron	<i>Ardea purpurea</i>	2	0	2	0	1	5
Family Scopidae/ storks								
9	Open-billed stork	<i>Anastomus lamelligerus</i>	350	56	59	0	25	450
10	Abdmis stork	<i>Ciconia abdimii</i>	50	16	43	0	22	131
11	Wooly-necked stork	<i>Ciconia episcopus</i>	43	17	63	0	32	155
12	Saddle-billed stork	<i>Ephippiorhynchus senegalensi</i>	2	14	6	0	7	29
13	Marabou stork	<i>Leptoptilos crumeniferus</i>	24	850	132	0	17	1023
14	Yellow-billed stork	<i>Mycteria ibis</i>	8	35	4	0	6	53
Family Threskiornithidae								
15	Sacred ibis	<i>Threskiornis aethiopicus</i>	39	13	51	0	0	103
16	African spoon bill	<i>Platalea alba</i>	12	0	0	0	0	12
Order Anseriformes								
Family Anatidae								
17	White-faced whistling duck	<i>Dendrocygna viduata</i>	33	0	0	0	0	33
18	Egyptian goose	<i>Alopchen aegyptiacus</i>	8	0	14	0	0	22
19	Mallard	<i>Anas platyhynchos</i>	2	0	0	0	0	2

Table 2: Number of Birds in Mayas in Dinder National Park RasAmir (A), Beitelwahsh (B), Abdelghani (C), Geririsa (D), Berkateltomsah (E)

S.No.	English / Local name	Scientific name	A	B	C	D	E	Total
20	Spur-winged goose	<i>Plectropterus gambensis</i>	550	0	0	0	4	554
Order Falconiformes								
Family Accipitridae								
21	Hooded vulture	<i>Necrosyrtes monachus</i>	2	0	5	0	82	89
22	Egyptian vulture	<i>Neophron perconopterus</i>						
23	Fish eagl	<i>Haliaeetus vocifer</i>	5	12	2	36	8	63
24	Black kite	<i>Milvus nigrans</i>	10	31	19	18	36	114
Order Galliformes								
Family Phasianidae								
25	Clappertoni francolin	<i>Framcolinus clappertoni</i>	0	0	0	0	12	12
Family Numididae								
26	Helmeted Guinea fowl	<i>Numida meleagris</i>	380	600	707	65	656	2408
Order Gruiformes								
Family Jacanidae								
27	Jacana	<i>Actophilornis africanus</i>	3	0	0	0	0	3
Order Charadriiformes								
Family Charadriidae								
28	Spur-winged plover	<i>Vanellus spinosus</i>	36	59	20	0	13	128
Family Scolopacidae								
29	Common sandpiper	<i>Actis hypoleucos</i>	3	0	2	0	7	12
30	Wood sandpiper	<i>Tringua goaveola</i>	2	0	0	0	0	2
Family Recurvirostridae								
31	Black-winged stilt	<i>Himantopus himantopus</i>	2	0	0	0	10	12
Order Columbiformes								
Family Columbidae								
32	Namaqua dove	<i>Oena capensis</i>	63	36	14	28	63	204
33	Mourning dove	<i>Streptopelia dicipiens</i>	113	130	79	18	148	488
34	Laughing dove	<i>Streptopelia sengalesis</i>	152	220	67	43	207	689
Apodiformes								
Apodida								
35	Palm swift	<i>Cypsiurus parvus</i>	110	80	24	25	140	379
Order Coliiformes								
Family Coliidae								
36	Blue-naped mousebird	<i>Urocolius macrourus</i>	2	2	0	0	0	4

Table 2: Number of Birds in Mayas in Dinder National Park RasAmir (A), Beitelwahsh (B), Abdelghani (C), Gerirrisa (D), Berkateltomsah (E)

S.No.	English / Local name	Scientific name	A	B	C	D	E	Total
Order Coraciiformes								
Family Alcedinidae								
37	Pied-kinfisher	<i>Ceryle rudis</i>	4	1	4	0	13	22
38	Malachite king fisher	<i>Alcedo cristata</i>	2	0	2	0	2	6
Family Meropidae								
39	Little-Bee-eater	<i>Merops pusillus</i>	2	1	3	0	3	9
Family Coraciidae								
40	Abyssinian roller	<i>Cpracoas abussomocis</i>	2	3	6	5	4	20
Family Upupidae								
41	Green wood hoopoe	<i>Poeniculus purpur</i>	1	0	1	0	5	7
Order Passeriformes								
Family Picidae								
42	Grey woodpecker	<i>Mesopicos goertae</i>	1	0	0	0	0	1
Family Dicruridae								
43	Drongo	<i>Dicrurus adsimills</i>	2	13	0	0	0	15
Family Sturnidae								
44	Blue-eared Glossy starling	<i>Lamprotornis chalybaeus</i>	48	149	38	112	57	404
45	Ruppell's-long tailed glossy starling	<i>Lamprotornis purpuropterus</i>	27	90	34	96	67	314
Family Timaliidae								
46	White vented bubul	<i>Turdoides barbatu</i>	13	0	6	0	14	33
Family Motacillidae								
47	White wagtail	<i>Motacilla alba</i>	18	2	14	0	8	52
48	Yellow wagtail	<i>Motacilla flava</i>	20	96	166	0	113	395
Family Nectarinidae								
49	Beautiful sunbirds	<i>Nectarinia pulchella</i>	5	1	2	0	55	63
Family Ploceidae								
50	Cinnamon weaver	<i>Ploceus badius</i>	1	0	0	0	0	1
51	Red-billed quelea	<i>Quelea quelea</i>	318	0	0	0	232	550
52	House sparrow	<i>Passer domesticus</i>	34	199	61	33	160	487
53	Grey-headed sparrow	<i>Passer griseus</i>	270	432	88	90	630	1510
Family Estrildidae								
54	Waxbill	<i>Estrilada astrild</i>	1	0	0	0	0	1
55	Red-billed firefinch	<i>Lagonosticta senegala</i>	4	0	2	23	34	63
56	Red-cheeked Cordon-belo	<i>Urageginthus bengalus</i>	2	0	0	0	12	14