



Diversity and Abundance of Bird's Species at Um Dum Island, Khartoum Province, Sudan

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Abstract

This study focuses on bird diversity and abundance as well as their conservation status in Um Dum Island, Khartoum area, Sudan, the Island considered a spot area to birds as it's surrounded with vegetation and wetlands that make suitable habitats for birds.

Um Dum Island hosts distinctive biodiversity, there are a number of bird species that make the island exclusive and valuable for the local ecosystems therefore indicating the importance of Island not only for biodiversity but also for human survival, development and local health environment.

The survey records standards such as bird species, number of individuals, weather conditions and time, data collection used direct bird count method over six months of the study period, from June to December 2020 except October bird counts and identification surveys were conducted once each month from 6:00 AM to 6:00 PM, Equipment used for data collection are a pair of binoculars (50 X 50 magnifications), telescope - Swarovski (660-940), digital still camera for documenting, data recording sheets, notebook, and an identification guide to the birds.

Birds species that identified compare with field guide of birds of Africa south of the Sahara.

In total, about 4343 individuals that belonged to 12 orders, with different abundances were observed in Um Dum Island belonging to 34 families of 53 species, the four most common birds identified were the House Sparrow with 926 individuals counted, followed by African Mourning Dove with 923 individuals followed by Greater blue-eared starling with 424 individuals counted, the Laughing Dove with 275 individuals counted and the Red-billed Fire finch with 210 individuals counted.

This result reflects the richness of the avifauna of the Um Dum Island, this richness is probably due to the use of the area for the availability of food, as well as the flora around the island and availability of water.

The highest number of birds observed was in June and July, the families observed with the maximum numbers of different species were Sturnidae, Passeridae, Columbidae and Estrildidae. The Um Dum Island eligible to be considered as an important bird's area, however the Island is still depauperate of the necessary data collection for this purpose, hence the importance of this study.

Keywords: Avifuna; Abundant; Direct Count; Species Richness; Conservation Status; Migratory; Palearctic

Introduction

Birds are important component of ecosystems and considered as an indicator species [1]. Population of birds is a sensitive indicator of pollution in both terrestrial and aquatic ecosystem [2,3].

Monitoring bird's populations and it's diversity enable better understanding for methods of conservation measures to insure long term survival.

Sudan, geographically, is located on the main routes used by migratory birds from three continents (Europe, Asia, and Africa). Sudan is an important migration route for birds providing them food, water and resting sites during long journey [4].

Khartoum is described as a suitable site for birds study. Which lies between the extreme desert to the north and dry wood savannah to the south considered as a transitional zone. Therefore representative of birds of both desert and savannah species are found [5]. Khartoum is located on the great migration route of most of the summer visitors to Europe and the rest of Palearctic region. It is also an important centre for many African migrants where spending their summer and more especially the rainy season in the north part of their range, and returning south to central and southern Africa during October after their breeding has finished. Moreover, during the winter months of the north temperate region, the Sudan is invaded by a large number of species which spend their non-breeding season in Africa. Many remain in the Sudan while others pass through to the south and stop over, rest, feed and drink [6].

The avifauna of Sudan includes 938 species before separation of South Sudan [7]. Over all 87 bird species were recorded in Al-Sunut Forest in Khartoum State. Among the recorded species, 50 were Palearctic migrants, 8 were local migrants and 29 species were resident [8]. Previous studies recorded that; Al - Sunut forest contains at least 70 species (among which 26 are migrants) [9,10].

Margani, N, N. recorded about 86 species in six sites of Khartoum state [11].

Khartoum state is characterized by islands on both white and blue Nile, Tutti, Um dum, Moran, and Sunt and Om shigiera that inhabit diverse vegetation cover which gives significant richness of birds. Also of this importance but these islands are not studied to fulfill specific information.

Osman Salah and Eihab Idris [12], studied Tuti Island at Khartoum state and stated that there is considerable significant temporal variations in bird diversity and abundance during season. Mutasim, E.A., *et al.* [13] recorded 88 species for the same site, and there is seasonal significant variation of abundance between species.

The aim of this study focuses on bird diversity and abundance as well as their conservation status in Um Dum Island, Khartoum, Sudan.

Objectives

- To determine the avifauna of the island and its conservation status.
- To determine the migratory populations and groups of the birds in the island.
- To determine major threats of feeding, breeding, and nesting sites within the island.

Material and Methods

Study area

The climate of Khartoum is tropical desert. There are three seasons per year, cool winter, dry summer and a rainy season. Highest temperatures (45°C or more) are recorded in summer months (May-June) while lowest temperatures (22°C or less) are recorded during winter months (December-January). The average rainfall is about 150 mm per annum. Nile flooding takes place during the rainy season (July-October) and affects both sites.

The study was conducted in Um Dum Island, Khartoum, Sudan (°N: 15 32 288.6 °E. 32 37 35. 8). The Um Dum Island is considered a spot area to birds as it is surrounded with vegetation and wetlands that make suitable habitats for birds. The weather is rainy in the summer, and cold and dry in the winter; temperature ranges from 25 to 40 °C between April and June, and from 20 to 35 °C in the months of July to October.

Human activities: Fishing, grazing hunting, farming.

Methodology

Direct observation technique (Direct count) was used for estimating the number of birds which is used by Elhussien 2011 to assess the abundance and distribution of birds in Dindir National Park [14], Elahassan 2011 to assess water birds in meadows of Dindir National Park [15]. Du Rou and Mondain used the same method for International Water Bird Census in Sudan from 2011 to 2013 [16]. Hussien 2018 used it to assess the diversity of water birds in some wetland of Sennar state, Sudan [17].

The study was carried out in the period from June to December 2020, covering late rainy and summer seasons. The survey records standards such as bird species, number of individuals, weather conditions and time. The survey was carried out by personal observations and by photo documentation. Data collection used direct bird count method from 7:00-10:00 a.m. over the six months of the study period; the surveys were undertaken always at the same time of day during six months. Bird counts and identification surveys were conducted once each month. Equipment used for data collec-

tion are a pair of binoculars (50 X 50 magnifications), telescope - Swarovski (660 - 940), digital still camera, data recording sheets, notebook, and an identification guide to the birds (Birds of Africa South of the Sahara by Peter Ryan and Ian Sinclair, second edition 2010). Line transects undertaken by continually walking along a 400m straight line transect in a moderate pace while noting all bird species observed or heard, its height above ground (below or above 3m), its distance from the transect (below or above 25m or 50m), number of birds observed and if it was only seen, heard or both.

Results and Discussion

Bird orders and families

In total, about 4343 individuals that comprised to 12 orders with different abundances were observed in Um Dum Island belonging to 34 families, including 53 species, of these, 1 species was in the order Accipitriformes (family Accipitridae), 1 species in the order Anseriformes (family Anatidae), 1 species in the order Apodiformes (Apodidae), 2 species in the order Bucerotiformes (family Bucerotidae and Upupidae), 1 species in the order Caprimulgiformes (Caprimulgidae), 5 species in order Charadriiformes (family Recurvirostridae, Scolopacidae, Pluvianidae, Scolopacidae and Charadriidae), 1 species in order Ciconiiformes (family Ciconiidae), 1 species in order Coliiformes (family Coliidae), 3 species in order Columbiformes (family Columbidae), 4 species in order Coraciiformes (family Coraciidae, Meropidae and Alcedinidae), 2 species in order Cuculiformes (family Cuculidae), 26 species in order Passeriformes (family Alaudidae, Charadriidae, Cisticolidae, Estrildidae, Hirundinidae, Leiothrichidae, Motacillidae, Muscicapidae, Nectariniidae, Passeridae, Ploceidae, Pycnonotidae, Sturnidae and Viduidae) and 6 species in order Pelecaniformes (family Threskiornithidae, Ardeidae and Charadriidae) see (Table 2) and (Figure 1-14).

Habitat use and preference

The habitat around the island is dominated by water, agricultural land, small shrubs and trees, the features around the island with agricultural schemes considered as habitat preferences for birds and abundance of food and water. Generally bird survey results can be strongly influenced by season, time of day and local habitat variation, including elevation [18]. Other variables such as weather conditions, human presence, observer's experience, number of observers and observers' own limitations and the fact that the avifauna of Sudan includes a total of 1013 species, some of which 3 are endemic, 1 has been introduced by humans, and 4 are rare or accidental. 10 species are globally threatened. [19,20]. The rest were classified as migratory bird species that relocate during the year can also influence the presence of birds. Therefore, and for a better understanding or even monitoring of habitat biodiversity,

surveys should ideally be done in different seasons and conditions. The four most common birds identified were the House Sparrow with 926 individuals counted, followed by African Mourning Dove with 923 individuals followed by Greater blue-eared starling with 424 individuals counted, the Laughing Dove with 275 individuals counted and the Red-billed Firefinch with 210 individuals counted (Table 1).

Um Dum Island birds diversity and richness

This result reflects the richness of the avifauna of the Um Dum Island. This richness is probably due to the use of the area for the availability of food, as well as the flora around the island and availability of water, which is diverse and contains a wide range of agricultural schemes providing a wide range of microhabitats for different species of birds. It is well known that vegetation cover has a strong influence on the avifauna [21]. The agricultural schemes provide a considerable amount of suitable habitats for feeding, or resting sites for birds. Variations in the bird species noted during the study period could be attributed to bird migration, with some migrating birds arriving in the area for feeding or using it as a stop-over site for food supply. The relatively high diversity of birds observed in the island suggests that the habitat of the area is suitable for birds. However, increasing anthropogenic activities are a matter of great concern when considering the future existence of these species, the bird density of the island reached during the period of the study, this indicates that ecological succession the density vary in the island may be due to the rainy seasons with flooding around the island and birds roosting in the trees however.

The highest number of birds observed was in June and July respectively (Table 1). The families observed with the maximum numbers of different species were Sturnidae, Passeridae, Columbidae and Estrildidae and the monthly number of birds observed during the study period is shown in (Tables 1 and 2).

The higher number of these species may be due to the availability of food in this time of the year which conforms with the beginning of rainy season.

Conservation status

The taxonomy and nomenclature of the birds observed were performed and their status information was tabulated according to the IUCN Red List of Threatened Species [22], all birds' species in this study are classified as Least Concern-LC category.

Key to status information: BR - Breeding record confirmed; M - Migrant including on passage through Sudan; P - Breeds in Palearctic; R - Resident (Present throughout the year; W - Winter visitor in

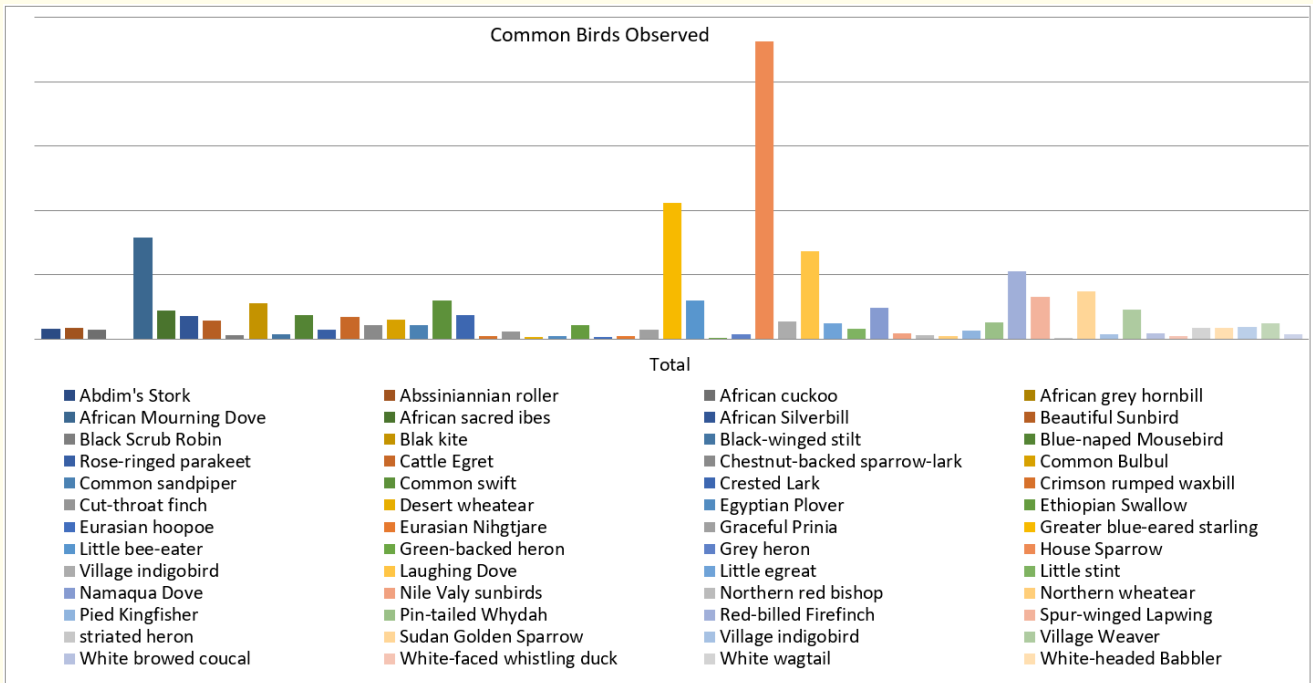


Figure 1: Common Birds Observed in Um Dum Island, Khartoum, Sudan during June – December 2020.

No	Order No	Order	Family	Species scientific name	Species English name	Jun	July	Aug	Sept	Nov	Dec	Total
1	1	Accipitriformes	Accipitridae	Milvus migrans	Blak kite	27	13	10	9	19	33	111
2	2	Anseriformes	Anatidae	Dendrocygna viduata	White-faced whistling duck	5	2	3	0	0	0	10
3	3	Apodiformes	Apodidae	Apus apus	Common swift	32	15	6	17	15	37	122
4	4	Bucerotiformes	Bucerotidae	Tockus nasutus	African grey hornbill	0	0	0	0	1	0	1
5		Bucerotiformes	Upupidae	Upupa epops	Eurasian hoopoe	2	1	0	3	0	1	7
6	5	Caprimulgi-formes	Caprimulgidae	Caprimulgus europaeus	Eurasian Nihgtjar	3	6	0	1	0	1	11
7	6	Charadriiformes	Recurvirostridae	Himantopus himantopus	Black-winged stilt	3	4	1	7	2	0	17
8		Charadriiformes	Scolopacidae	Actitis hypoleucos	Common sandpiper	7	5	9	4	9	11	45
9		Charadriiformes	Pluvianidae	Pluvianus aegyptius	Egyptian Plover	3	0	1	0	0	7	11
10		Charadriiformes	Scolopacidae	Calidris minuta	Little stint	9	5	3	4	5	7	33
11		Charadriiformes	Charadriidae	Vanellus spinosus	Spur-winged Lapwing	32	7	12	27	17	37	132
12	7	Ciconiiformes	Ciconiidae	Ciconia abdimii	Abdim's Stork	7	0	2	9	4	11	33
13		Ciconiiformes	Threskiornithidae	Threskiornis aethiopicus	African sacred ibes	8	7	17	22	16	19	89
14		Ciconiiformes	Ardeidae	Bubulcus ibis	Cattle Egret	11	3	7	28	2	18	69
15		Ciconiiformes	Ardeidae	Butorides striata	Green-backed heron	0	0	0	3	1	0	4
16		Ciconiiformes	Ardeidae	Ardea cinerea	Grey heron	3	6	1	0	2	4	16
17		Ciconiiformes	Ardeidae	Egretta garzetta	Little egret	14	6	12	8	2	9	51
18		Ciconiiformes	Ardiedae	Butorides striata	striated heron	2	1	0	1	0	1	5
19	8	Coliiformes	Coliidae	Urocolius macrourus	Blue-naped Mousebird	23	9	0	6	15	22	75

20	9	Columbiformes	Columbidae	Streptopelia decipiens	African Mourning Dove	80	115	7	33	3	77	923
21		Columbiformes	Columbidae	Spilopelia senegalensis	Laughing Dove	73	72	43	28	27	32	275
22		Columbiformes	Columbidae	Oena capensis	Namaqua Dove	29	23	13	7	17	8	97
23	10	Coraciiformes	Coraciidae	Coracias abyssinicus	Abssiniannian roller	7	3	2	5	12	6	35
24		Coraciiformes	Meropidae	Merops orientalis	Little bee-eater	39	28	4	15	9	27	122
25		Coraciiformes	Alcedinidae	Ceryle rudis	Pied Kingfisher	5	2	7	1	2	9	26
26		Coraciiformes	Meropidae	Merops albicollis	White-throated Bee-eater	12	6	2	3	8	9	40
27	11	Cuculiformes	Cuculidae	Cuculus gularis	African cuckoo	9	5	3	0		12	29
28		Cuculiformes	Cuculidae	Centropus superciliosus	White browned coucal	7	3	0	0	5	3	18
29	12	Passeriformes	Estrildidae	Euodice cantans	African Silverbill	17	0	24	7	2	23	73
30		Passeriformes	Nectariniidae	Cinnyris pulchella	Beautiful Sunbird	12	3	6	2	14	22	59
31		Passeriformes	Muscicapidae	Cercotrichas podobe	Black Scrub Robin	6	2	0	1	2	3	14
32		Passeriformes	Alaudidae	Eremopterix leucotis	Chestnut-backed sparrow-lark	13	22	0	9	0	0	44
33		Passeriformes	Pycnonotidae	Pycnonotus barbatus	Common Bulbul	19	9	1	6	6	19	60
34		Passeriformes	Alaudidae	Galerida cristata	Crested Lark	6	13	18	9	16	13	75
35		Passeriformes	Estrildidae	Estrilda rhodopyga	Crimson rumped waxbill	3	0	1	0	5	0	9
36		Passeriformes	Estrildidae	Amadina fasciata	Cut-throat finch	3	2	1	7	4	8	25
37		Passeriformes	Muscicapidae	Oenanthe deserti	Desert wheatear	3	5	0	0	0	0	8
38		Passeriformes	Hirundinidae	Hirundo aethiopica	Ethiopian Swallow	13	8	10	4	2	7	44
39		Passeriformes	Cisticolidae	Prinia gracilis	Graceful Prinia	9	5	1	3	9	4	31
40		Passeriformes	Sturnidae	Lamprotornis chalybaeus	Greater blue-eared starling	88	193	17	38	35	53	424
41		Passeriformes	Passeridae	Passer domesticus	House Sparrow	217	388	20	67	20	214	926
42		Passeriformes	Viduidae	Vidua chalybeata	Village indigobird	20	17	6	7	12	8	70
43		Passeriformes	Nectariniidae	Hedydipna metallica	Nile Vally sunbirds	3	0	4	1	4	6	18
44		Passeriformes	Ploceidae	Euplectes franciscanus	Northern red bishop	7	0	2	0	1	3	13
45		Passeriformes	Muscicapidae	Oenanthe oenanthe	Northern wheatear	5	3	1	0	0	0	9
46		Passeriformes	Viduidae	Vidua macroura	Pin-tailed Whydah	14	3	0	9	11	17	54
47		Passeriformes	Estrildidae	Lagonosticta senegala	Red-billed Firefinch	57	76	8	16	22	31	210
48		Passeriformes	Passeridae	Passer luteus	Sudan Golden Sparrow	24	76	0	8	13	28	149
49		Passeriformes	Ploceidae	Ploceus cucullatus	Village Weaver	17	43	2	1	7	22	92
50		Passeriformes	Motacillidae	Motacilla alba	White wagtail	7	2	5	9	6	7	36
51		Passeriformes	Leiothrichidae	Turdoides leucocephala	White-headed Babbler	3	8	4	7	9	6	37
52		Passeriformes	Motacillidae	Motacilla flava	Yellow wagtail	9	2	0	13	7	18	49
53		Passeriformes	Cisticolidae	Cisticola juncidis	Zitting cisticola	2	1	0	4	3	5	15
Total						1029	1228	296	469	238	918	4951

Table 1: List of Birds' Species and Numbers Observed in Um Dum Island, Khartoum, Sudan during June – December 2020.

No	Order Name	Family	Total number of Species	Species scientific name	Species English name	Status	IUCN Red list	Total number observed
1	Accipitriformes	Accipitridae	1	Milvus migrans	Blak kite	PM	LC	111
2	Anseriformes	Anatidae	1	Dendrocygna viduata	White-faced whistling duck	LM/BR	LC	10
3	Apodiformes	Apodidae	1	Apus apus	Common swift	LM/BR	LC	122
4	Bucerotiformes	Bucerotidae	1	Tockus nasutus	African grey hornbill	AM	LC	1
5	Bucerotiformes	Upupidae	1	Upupa epops	Eurasian hoopoe	PM	LC	7
6	Caprimulgiformes	Caprimulgidae	1	Caprimulgus europaeus	Eurasian Nihgtjar	PM	LC	11
7	Ciconiformes	Threskiornithidae	6	Threskiornis aethiopicus	African sacred ibes	AM/LM/BR	LC	89
8	Ciconiformes	Ardeidae		Bubulcus ibis	Cattle Egret	LM/AM/BR	LC	69
9	Ciconiformes	Ardeidae		Butorides striata	Green-backed heron	LM/BR	LC	4
10	Ciconiformes	Ardeidae		Ardea cinerea	Grey heron	LM/PM/BR	LC	16
11	Ciconiformes	Ardeidae		Egretta garzetta	Little egret	LM/PM	LC	51
12	Ciconiformes	Ardeidae		Butorides striata	striated heron	RB/BR		5
13	Ciconiiformes	Ciconiidae	1	Ciconia abdimii	Abdim's Stork	AM/ BR	LC	33
14	Coliiformes	Coliidae	1	Urocolius macrourus	Blue-naped Mousebird	LM/AM/BR	LC	75
15	Columbiformes	Columbidae	3	Streptopelia decipiens	African Mourning Dove	R LM/AM	LC	315
16	Columbiformes	Columbidae		Spilopelia senegalensis	Laughing Dove	LM/ AM /BR	LC	275
17	Columbiformes	Columbidae		Oena capensis	Namaqua Dove	LM/AM/PM	LC	97
18	Coraciiformes	Coraciidae	4	Coracias abyssinicus	Abssiniannian roller	AM/LM/BR	LC	35
19	Coraciiformes	Meropidae		Merops orientalis	Little bee-eater	AM/LM/BR	LC	122
20	Coraciiformes	Alcedinidae		Ceryle rudis	Pied Kingfisher	R/LM/AM	LC	26
21	Coraciiformes	Meropidae		Merops albicollis	White-throated Bee-eater	AM/LM	LC	40
22	Cuculiformes	Cuculidae	2	Cuculus gularis	African cuckoo	AM	LC	29
23	Cuculiformes	Cuculidae		Centropus superciliosus	White browed cou-cal	AM	LC	18
24	Charadriiformes	Recurvirostridae	5	Himantopus himantopus	Black-winged stilt	PM	LC	17
25	Charadriiformes	Scolopacidae		Actitis hypoleucos	Common sandpiper	PM	LC	45
26	Charadriiformes	Pluvianidae		Pluvianus aegyptius	Egyptian Plover	LM/BR	LC	11
27	Charadriiformes	Scolopacidae		Calidris minuta	Little stint	PM	LC	33
28	Charadriiformes	Charadriidae		Vanellus spinosus	Spur-winged Lapwing	LM/PM/BR	LC	132
29	Passeriformes	Estrildidae	27	Euodice cantans	African Silverbill	R/LM	LC	73
30	Passeriformes	Nectariniidae		Cinnyris pulchella	Beautiful Sunbird	AM/PM/BR	LC	59
31	Passeriformes	Muscicapidae		Cercotrichas podobe	Black Scrub Robin	AM/LM	LC	14
32	Passeriformes	Alaudidae		Eremopterix leucotis	Chestnut-backed sparrow-lark	LM/AM	LC	44
33	Passeriformes	Pycnonotidae		Pycnonotus barbatus	Common Bulbul	R/BR	LC	60
34	Passeriformes	Alaudidae		Galerida cristata	Crested Lark	LM	LC	75

35	Passeriformes	Estrildidae		Estrilda rhodopyga	Crimson rumped waxbill	LM	LC	9
36	Passeriformes	Estrildidae		Amadina fasciata	Cut-throat finch	LM/BR	LC	25
37	Passeriformes	Muscicapidae		Oenanthe deserti	Desert wheatear	PM	LC	8
38	Passeriformes	Muscicapidae		Oenanthe oenanthe	Northern wheatear	PM	LC	9
39	Passeriformes	Hirundinidae		Hirundo aethiopica	Ethiopian Swallow	AM/BR	LC	44
40	Passeriformes	Cisticolidae		Prinia gracilis	Graceful Prinia	LM	LC	31
41	Passeriformes	Sturnidae		Lamprotornis chalybaeus	Greater blue-eared starling	LM	LC	424
42	Passeriformes	Passeridae		Passer domesticus	House Sparrow	R	LC	926
43	Passeriformes	Viduidae		Vidua chalybeata	Village indigobird	AM/PM	LC	55
44	Passeriformes	Nectariniidae		Hedydipna metallica	Nile Vally sunbirds	LM/R	LC	18
45	Passeriformes	Ploceidae		Euplectes franciscanus	Northern red bishop	LM/R	LC	13
46	Passeriformes	Viduidae		Vidua macroura	Pin-tailed Whydah	AM	LC	54
47	Passeriformes	Estrildidae		Lagonosticta senegala	Red-billed Firefinch	R/LM	LC	210
48	Passeriformes	Passeridae		Passer luteus	Sudan Golden Sparrow	RB	LC	149
49	Passeriformes	Ploceidae		Ploceus cucullatus	Village Weaver	AM/LM	LC	92
50	Passeriformes	Motacillidae		Motacilla alba	White wagtail	PM	LC	36
51	Passeriformes	Leiothrichidae		Turdoides leucocephala	White-headed Babbler	LM	LC	37
52	Passeriformes	Motacillidae		Motacilla flava	Yellow wagtail	PM	LC	49
53	Passeriformes	Cisticolidae		Cisticola juncidis	Zitting cisticola	LM/BRR	LC	15
Total species			53	Total number of individuals				4343

Table 2: Birds' Species and their General Status Observed in Um Dum Island, Khartoum, Sudan during June – December 2020.

Sudan (non-breeding season); RB - Resident in Sudan as confirmed by breeding record; PM - Breeds in the Palearctic and winters in Sudan; AM - Intra African Migrant; RB/PW - There is both a resident breeding population and a wintering population; AM - Intra African Migrant; LC - Least Concern.

Um Dum Island hosts distinctive biodiversity of a number of bird species that make the island exclusive and valuable for the local ecosystems therefore indicating the importance of Island not only for biodiversity but also for human survival, development and local health environment, therefore currently eligible to be consid-

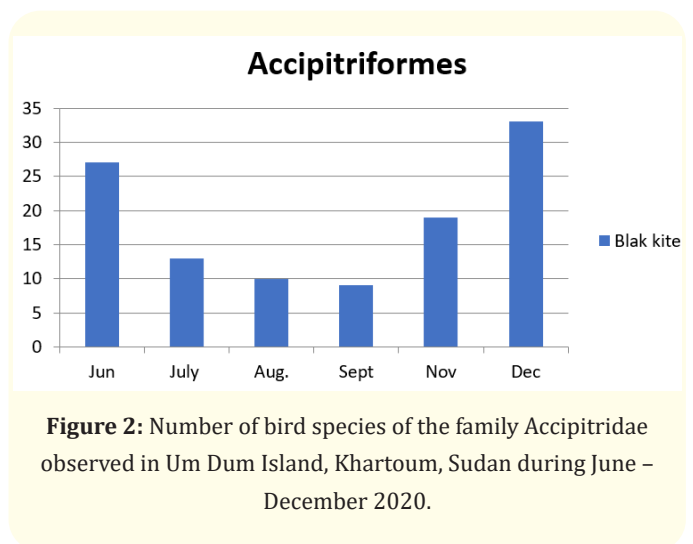


Figure 2: Number of bird species of the family Accipitridae observed in Um Dum Island, Khartoum, Sudan during June – December 2020.

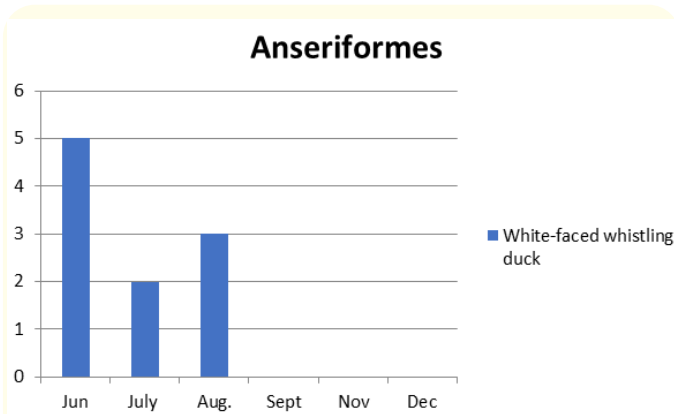


Figure 3: Number of bird species of the family Anatidae observed in Um Dum Island, Khartoum, Sudan during June – December 2020.

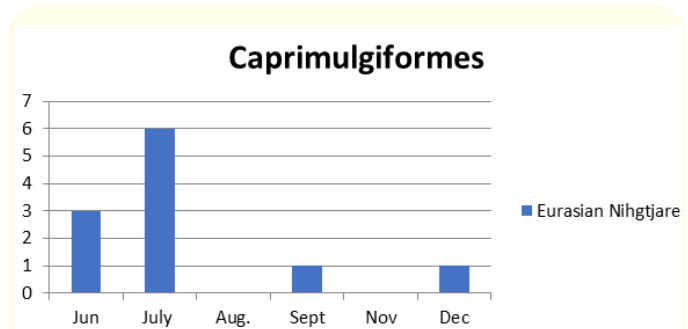


Figure 6: Number of bird species of the family Caprimulgidae observed in Um Dum Island, Khartoum, Sudan during June – December 2020.

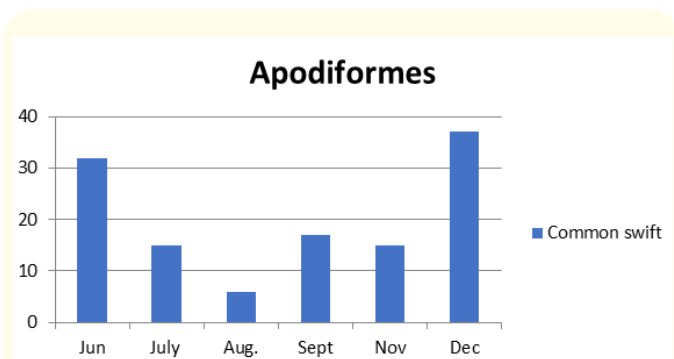


Figure 4: Number of bird species of the family Apodidae observed in Um Dum Island, Khartoum, Sudan during June – December 2020.

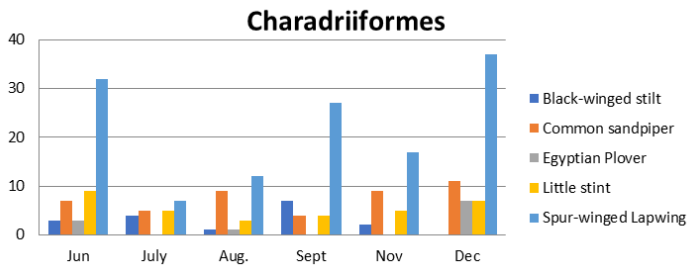


Figure 7: Number of bird species of the family Recurvirostridae, Scolopacidae, Pluvianidae, Scolopacidae and Charadriidae observed in Um Dum Island, Khartoum, Sudan during June – December 2020.

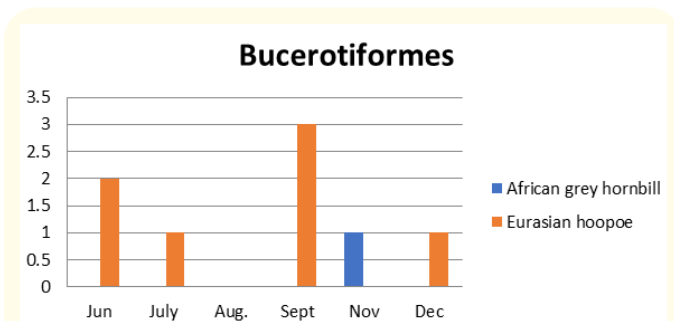


Figure 5: Number of bird species of the family Bucerotidae and Upupidae observed in Um Dum Island, Khartoum, Sudan during June – December 2020.

Lado, B.D. (1994). Birds of Sunut forest in Khartoum. M.Sc. Thesis . Zoology Department, Faculty of Science.

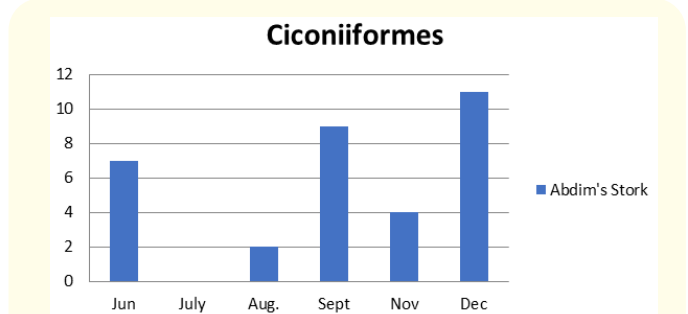


Figure 8: Number of bird species of the family Ciconiidae observed in Um Dum Island, Khartoum, Sudan during June – December 2020.

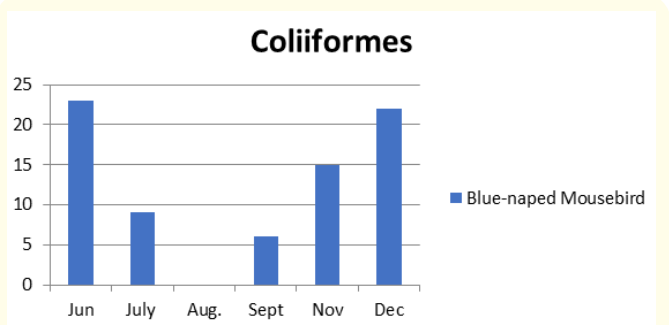


Figure 9: Number of bird species of the family Coliidae observed in Um Dum Island, Khartoum, Sudan during June - December 2020.

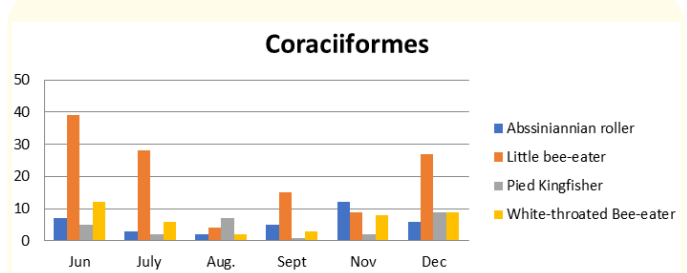


Figure 11: Number of bird species of the family Coraciidae, Meropidae and Alcedinidae observed in Um Dum Island, Khartoum, Sudan during June - December 2020.

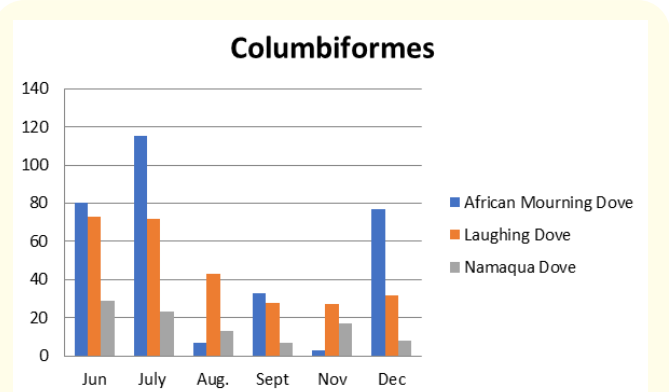


Figure 10: Number of bird species of the family Columbidae observed in Um Dum Island, Khartoum, Sudan during June - December 2020.

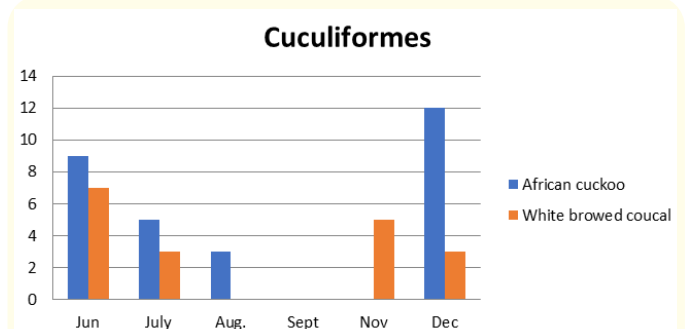


Figure 12: Number of bird species of the family Cuculidae observed in Um Dum Island, Khartoum, Sudan during June - December 2020.

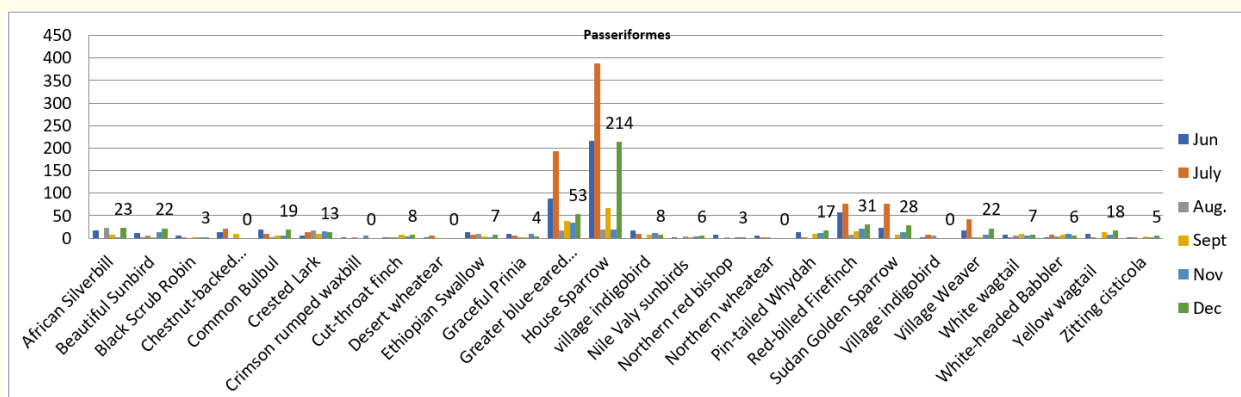


Figure 13: Number of bird species of the family Alaudidae, Charadriidae, Cisticolidae, Estrildidae, Hirundinidae, Leiothrichidae, Motacillidae, Muscicapidae, Nectariniidae, Passeridae, Ploceidae, Pycnonotidae, Sturnidae and Viduidae observed in Um Dum Island, Khartoum, Sudan during June - December 2020.

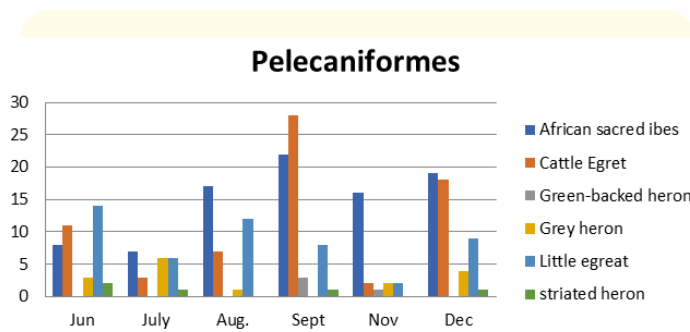


Figure 14: Number of bird species of the family Threskiornithidae, Ardeidae and Charadriidae observed in Um Dum Island, Khartoum, Sudan during June – December 2020.

ered as important bird area, Um Dum Island is still depauperate of the necessary data collection for this purpose, hence the importance of this study as a tool to contribute not only to Um Dum Island general birds species list but also for its important as wetland of national scale.

Conclusion and Recommendations

Conclusion

In conclusion, this study provided a baseline of abundant and availability of bird species at Um Dum Island attracted numerous numbers of birds. The foraging bird community at Um Dum Island site is characterized species diversity and richness, but high abundance and dominance of few species. In total, about 4343 individuals that classified to 13 orders, with different family reach to 34 families with species richness of 53 species. The four most common birds identified were the House Sparrow with 926 individuals counted, followed by African Mourning Dove with 923 individuals followed by Greater blue-eared starling with 424 individuals counted, the Laughing Dove with 275 individuals counted and the Red-billed Firefinch with 210 individuals counted.

The highest number of birds observed were in June and July, Generally the birds abundance results influenced by season, time of day and local habitat variation, including elevation, Other variables such as weather conditions, human presence, observer's experience, number of observers and.

Recommendations

The major study findings are

- Conservation of the island habitat is necessary through the awareness and control of human activities.
- Annual and seasonal survey for monitoring the avifauna of

the island is needed to determine bird's diversity and abundance as well as their conservation status.

- Um Dum Island has potential to become a tourist resource through the spectacle of birds that can attract both bird-watchers and a broader spectrum of tourists and ornithologists researchers.

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