Identification of bird species and their conservation status in Tuti Island, Sudan

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Abstract

This study was conducted in Tuti island at the confluence of the White Nile and the Blue Nile in Khartoum city, directly opposite the northern side of the city of Khartoum, the capital of the Sudan, in the period from June 2016 to May 2017 covering three seasons namely cool winter, dry summer and the rainy season. A direct bird's count method is used for data collection. In total, about 8888 individuals that belonged to 88 species, 20 orders were observed in this study.

Keywords

Tuti Island, bird species, direct bird count method

1. Introduction

birds are a useful indicator of habitats' health and can be an efficient and straightforward means for either monitoring environmental changes (Furness et al, 1993) or for assessing biodiversity importance (Starkley et al., 2002) as they are taxonomically stable, easily surveyed and widely distributed across almost all habitats, amongst other reasons. Birds are the easiest group to monitor if changes in forest biodiversity need to be assessed (Benum, 1999). The avifauna of Sudan numbers 937 species of which 616 are resident and 312 are regular seasonal migrants, including 214 Palearctic species.

Data on conservation and protecting of bird populations have been particularly challenging, this is because of the vast range of habitats they occupy during the course of their seasonal cycle and the need to undertake work in different ecological conditions in the feeding and breeding grounds.

The vegetation coverage of the study area is threaten by several human activities including overgrazing and agriculture, change of land use in favor of built forms aggravated by the bridge erection and increasing population (Eltayeb et al. 2012) this is one of factors effecting the birds diversity too.

The Island is stressed by overgrazing and waste disposal, the most important threat, however, is the reclamation of the Island for construction purposes. As the Tuti Island population continues to grow, it is expected that the threats facing the Island will increase in magnitude, unless adequate management plans are designed and thoroughly implemented. There is also a lack of awareness of the importance of the birds and the biodiversity in island by the community (visitors, farmers, fisheries, grazers, etc) and this constitutes a main threat to the habitat.

Reliable information gathered on bird's diversity is useful to identify and conserve the bird's island; such knowledge provides both guidelines for accomplishing the desired conservation strategy. The main objectives of the Study were to identify birds species and their conservation status in Tuti Island.

2. Study Area

Tuti is an Island at the confluence of the White Nile and the Blue Nile in Khartoum city, directly opposite the northern side of the city of Khartoum, the capital of the Sudan. It can be described as a rural “eye” in the center of Khartoum conurbation (Davies, 1994). This feature makes it unique and generates the island exceptional identity to the extended to be named as a “Surprising Place” (Ibrahim & Davies, 1991).

The total area of the Island in 2012 is about 472.3 Hectare. (15°37'N, 32°31'E), Tuti is generally flat terrain with gentle slope towards the edges. The southeast part is slightly lower than the other parts, thus it is frequently covered with yearly floods. A recent study on the flora in Tuti island suggested that the island is favored with rich vegetation content (Abdelmageed, 2008). the flora In Tuti Island is much more diverse and complex, containing variable trees, shrubs, grasses and herbs, this difference implies that the Island have a wider range of microhabitats for different species of birds and hence the higher species richness (Abdelmageed, 2008). No previous studies has been conducted on birds in Tuti island so the goal of this study was to determine bird species and their conservation status in Tuti island, Sudan.

3. Methodology

The survey was carried out in the period from June 2016 to May 2017, covering three seasons namely cool winter, dry summer and the rainy season. The survey conducted at morning considered the suitable time of the day, and record standards such as birds species, numbers, weather conditions and time. The survey was carried by a team of three ornithologists and one photographer. A direct bird's count method is used for data collection. Bird counts and identification surveys were conducted twice a month for three seasons. The information gathered analyzed and designed in order to generate results that meet the objectives of the study.

Equipments used for data collection:

- A pair of binoculars (50X50 magnifications).
- Telescope – Swaroski (660 – 940).
- Digital still camera
- Data recording sheets
- Note book
- An identification field guide to the birds of Africa, second edition 2010.

4. Results and Discussion

In total, about 8888 individuals that belonged to 88 species, 20 orders were observed in this study (Table 1) and (fig 1- fig 20) . of these, 2 species were in the order Ciconiiformes, 4 species Columbiformes, 5 species were in the order Coraciiformes, 3 species were in the order Apodiformes, 11 species were in the order Pelecaniformes, 31 Passeriformes species were in the order, 13 species were in the order Charadriiformes, 1 species was in the order Accipitriformes, 1 species was in the order Coliiformes, 2 species were in the order Cuculiformes, 2 species were in the order Apodiformes, 3 species were in the order Bucerotiformes, 1 species was in the order Caprimulgiformes, 1 species was in the order Accipitriformes, 1 species was in the order Piciformes, 2 species were in the order Coraciiformes, 2 species were in the order Bucerotiformes, 1 species was in the order Suliformes, 1 species was in the order Anseriformes, 3 species were in the order Coraciiformes.

Generally bird survey results can be strongly influenced by season, time of day and local habitat variation, including elevation (Davies, 2002). 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 them classified as migratory bird species that relocate during the year can also influence on 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 (*Passer domesticus*) with 2694 birds identified, followed by the Laughing Dove (*Spilopelia senegalensis*) with 645 birds identified, the Cattle Egret (*Bubulcus ibis*) with 573 birds identified and the black Greater blue eared starling (*Lamprotornis chalybaeus*) with 402 birds identified.

Table 1. Bird species encountered in Tuti Island and their conservation status during 2016- 2017

Order	Family	Species common name	Scientific name	Migratory status	Status/IUCN
Ciconiiformes	Ciconiidae	Abdim's Stork	<i>Ciconia abdimii</i>	AM	LC
Coraciiformes	Coraciidae	Abssiniannian roller	<i>Coracias abyssinicus</i>	AM/LM	LC
Columbiformes	Columbidae	African Mourning Dove	<i>Streptopelia decipiens</i>	R	LC
Apodiformes	Apodidae	African Palm swift	<i>Cypsiurus parvus</i>	LM/R	LC
Pelecaniformes	Threskiornithidae	African sacred ibes	<i>Threskiornis aethiopicus</i>	AM/LM	LC
Passeriformes	Estrildidae	African Silverbill	<i>Euodice cantans</i>	R/LM	LC
Pelecaniformes	<i>Threskiornithidae</i>	African spoon bill	<i>Platalea alba</i>	AM/LM	LC
Passeriformes	Nectariniidae	Beautiful sunbird	<i>Cinnyris pulchella</i>	R	LC
Passeriformes	Muscicapidae	Black Scrub Robin	<i>Cercotrichas podobe</i>	R	LC
Charadriiformes	Scolopacidae	Black tailed Godwit	<i>Limosa limosa</i>	PM	LC
Columbiformes	Columbidae	Black-billed Wood Dove	<i>Turtur abyssinicus</i>	LM/R	LC
Pelecaniformes	Ardeidae	Black-Headed Heron	<i>Ardea melanocephala</i>	LM/R	LC
Charadriiformes	<i>Charadriidae</i>	Black-headed lapwing	<i>Vanellus tectus</i>	R/LM	LC
Charadriiformes	Recurvirostridae	Black-winged stilt	<i>Himantopus himantopus</i>	AM/PM	LC
Accipitriformes	<i>Accipitridae</i>	Blak kite	<i>Milvus migrans</i>	PM	LC
Coliiformes	<i>Coliidae</i>	Blue-naped Mousebird	<i>Urocolius macrourus</i>	R	LC
Charadriiformes	Laridae	Caspian tern	<i>Hydroprogne caspia</i>	PM/R/LM	LC
Pelecaniformes	Ardeidae	Cattle Egret	<i>Bubulcus ibis</i>	AM/LM/PM	LC
Passeriformes	Pycnonotidae	Common Bulbul	<i>Pycnonotus barbatus</i>	R	LC
Cuculiformes	Cuculidae	African cuackoo	<i>Cuculus gularis</i>	AM	LC
Charadriiformes	<i>Charadriidae</i>	Common ringed plover	<i>Charadrius hiaticula</i>	PM	LC
Charadriiformes	Scolopacidae	Common sandpiper	<i>Actitis hypoleucos</i>	PM	LC
Apodiformes	Apodidae	Common swift	<i>Apus apus</i>	R/LM	LC
Passeriformes	Alaudidae	Crested Lark	<i>Galerida cristata</i>	R	LC
Passeriformes	Estrildidae	Crimson rumped waxbill	<i>Estrilda rhodopyga</i>	R	LC
Passeriformes	Estrildidae	Cut-throat finch	<i>Amadina fasciata</i>	R/LM	LC
Passeriformes	Turdidae	Desert wheatear	<i>Oenanthe deserti</i>	PM	LC
Charadriiformes	Glareolidae	Egyptian Plover	<i>Pluvianus aegyptius</i>	LM/R	LC
Passeriformes	Hirundinidae	Ethiopian Swallow	<i>Hirundo aethiopica</i>	AM/R	LC
Bucerotiformes	Upupidae	Eurasian hoopoe	<i>Upupa epops</i>	AM/LM/R	LC
Caprimulgiformes		Eurasian Nihgt Gare	<i>Caprimulgus europaeus</i>	PM	LC
Charadriiformes	Burhinidae	Eurasian thick-knee	<i>Burhinus oedicnemus</i>	PM	LC
Accipitriformes	<i>Accipitridae</i>	Gabar Goshawk	<i>Micronisus gabar</i>	R	LC
Passeriformes	Passeridae	Sudan golden Sparrow	<i>Passer luteus</i>	LM/R	LC
Passeriformes	Cisticolidae	Graceful Prinia	<i>Prinia gracilis</i>	R	LC
Pelecaniformes	Ardeidae	Great egret	<i>Ardea alba</i>	PM/LM/AM	LC
Pelecaniformes	Pelecanidae	Great white pelican	<i>Pelecanus onocrotalus</i>	AM/PM	LC
Passeriformes	Sturnidae	Greater blue-eared starling	<i>Lamprotornis chalybaeus</i>	R/LM	LC

Table 1. *cont.*

Order	Family	Species common name	Scientific name	Migratory status	Status/IUCN
Psittaciformes	Psittacidae	Rose-ringed parakeet	<i>Psittacula krameri</i>	AM	LC
Charadriiformes	Scolopacidae	Green sandpiper	<i>Tringa ochropus</i>	PM	LC
Pelecaniformes	Ardeidae	Green-backed heron	<i>Butorides striata</i>		LC
Pelecaniformes	Ardeidae	Grey heron	<i>Ardea cinerea</i>	LM/PM	LC
Piciformes	Picidae	Grey woodpecker	<i>Dendropicos goertae</i>	R	LC
Passeriformes	Passeridae	House Sparrow	<i>Passer domesticus</i>	R	LC
Columbiformes	Columbidae	Laughing Dove	<i>Spilopelia senegalensis</i>	LM/R/PM	LC
Coraciiformes	Meropidae	Little Bee eater	<i>Merops pusillus</i>	LM/R	LC
Pelecaniformes	Ardeidae	Little egret	<i>Egretta garzetta</i>	LM/PM	LC
Charadriiformes	Scolopacidae	Little stint	<i>Calidris minuta</i>	PM	LC
Apodiformes	Apodidae	African palm swift	<i>Cypsiurus parvus</i>	R/LM	LC
Coraciiformes	Alcedinidae	Malachite Kingfisher	<i>Corythornis cristatus</i>	R/LM	LC
Charadriiformes	Scolopacidae	Marsh sandpiper	<i>Tringa stagnatilis</i>	PM	LC
Passeriformes	Laniidae	Masked shrike	<i>Lanius nubicus</i>	PM	LC
Passeriformes	Ploceidae	Northern Masked waver	<i>Ploceus taeniopterus</i>	LM/R	LC
Columbiformes	Columbidae	Namaqua Dove	<i>Oena capensis</i>	R/LM/AM/PM	LC
Passeriformes	Nectariniidae	Nile Valy sunbirds	<i>Hedydipna metallica</i>	LM/R	LC
Passeriformes	Ploceidae	Northern red bishop	<i>Euplectes franciscanus</i>	LM/R	LC
Passeriformes	Turdidae	Northern wheatear	<i>Oenanthe oenanthe</i>	PM	LC
Coraciiformes	Alcedinidae	Pied Kingfisher	<i>Ceryle rudis</i>	R/LM/AM	LC
Passeriformes	Muscicapidae	Pied wheatear	<i>Oenanthe pleschanka</i>	PM	LC
Passeriformes	Viduidae	Pin-tailed Whydah	<i>Vidua macroura</i>	R	LC
Bucerotiformes	Bucerotidae	Northern red-billed hornbill	<i>Tockus erythrorhynchus</i>	R	LC
Bucerotiformes	Bucerotidae	African grey hornbill	<i>Lophoceros nasutus</i>		LC
Passeriformes	Estrildidae	Red-cheeked cordonbleu	<i>Uraeginthus bengalus</i>	R	LC
Passeriformes	Estrildidae	Red-billed Firefinch	<i>Lagonosticta senegala</i>	R	LC
Suliformes	Phalacrocoracidae	Reed (long-tailed) cormorant	<i>Microcarbo africanus</i>		LC
Passeriformes	Muscicapidae	Rufous-tailed scrub-robin	<i>Cercotrichas galactotes</i>	LM/R	LC
Charadriiformes	Burhinidae	Senegal Thick-knee	<i>Burhinus senegalensis</i>	R/LM	LC
Passeriformes	Muscicapidae	Spotted flycatcher	<i>Muscicapa striata</i>	PM	LC
Charadriiformes	Charadriidae	Spur-winged Lapwing	<i>Vanellus spinosus</i>	LM/PM	LC
Pelecaniformes	Ardeidae	Squacco heron	<i>Ardeola ralloides</i>	AM/LM	LC
Piciformes	Lybiidae	Vieillot's barbet	<i>Lybius vieilloti</i>	R	LC
Passeriformes	Viduidae	Village indigobird	<i>Vidua chalybeata</i>	R	LC
Passeriformes	Ploceidae	Village Weaver	<i>Ploceus cucullatus</i>	AM/LM	LC
Cuculiformes	Cuculidae	White browed coucal	<i>Centropus superciliosus</i>	R	LC
Passeriformes	Motacillidae	White Wagtail	<i>Motacilla alba</i>	PM	LC
Passeriformes	Leiotherichidae	White-headed Babbler	<i>Turdoides leucocephala</i>	R	LC
Coraciiformes	Meropidae	White-throated Bee-eater	<i>Merops albicollis</i>	AM/LM	LC
Charadriiformes	Scolopacidae	Wood Sandpiper	<i>Tringa glareola</i>	PM	LC
Piciformes	Lybiidae	Yellow-breasted barbet	<i>Trachyphonus margaritatus</i>	R	LC
Ciconiiformes	Ciconiidae	yellow-billed stork	<i>Mycteria ibis</i>	LM	LC
Passeriformes	Motacillidae	Yellow Wagtail	<i>Motacilla flava</i>	PM	LC
Pelecaniformes	Ardeidae	Yellow-billed egret	<i>Ardea brachyrhyncha</i>	AM/LM	LC
Passeriformes	Cisticolidae	Zitting cisticola	<i>Cisticola juncidis</i>	LM/R	LC
Anseriformes	Anatidae	Hottentot Teal	<i>Spatula hottentota</i>	AM	LC
Anseriformes	Anatidae	Common teal	<i>Anas crecca</i>		LC
Anseriformes	Anatidae	Northern Shoveller	<i>Spatula clypeata</i>	PM	LC
Pelecaniformes	Threskiornithidae	Eurasian spoonbill	<i>Platalea leucorodia</i>	PM	LC

Fig 1. Number of bird's species of the order Ciconiiformes observed in Tuti Island between 2016 -2017.

Fig 2. Number of bird's species of the order Columbiformes observed in Tuti Island between 2016 -2017.

Fig 3. Number of bird's species of the order Coraciiformes observed in Tuti Island between 2016 -2017.

Fig 4. Number of bird's species of the order Apodiformes observed in Tuti Island between 2016 -2017.

Fig 5. Number of bird's species of the order Pelecaniformes observed in Tuti Island between 2016 -2017.

Fig 6. Number of bird's species of the order Passeriformes observed in Tuti Island between 2016 -2017.

Fig 7. Number of bird's species of the order Charadriiformes observed in Tuti Island between 2016 -2017.

Fig 8. Number of bird's species of the order Accipitriformes observed in Tuti Island between 2016 -2017.

Fig 9. Number of bird's species of the order Coliiformes observed in Tuti Island between 2016 -2017.

Fig 10. Number of bird's species of the order Cuculiformes observed in Tuti Island between 2016 -2017.

Fig 11. Number of bird's species of the order Apodiformes observed in Tuti Island between 2016 -2017.

Fig 12. Number of bird's species of the order Bucerotiformes observed in Tuti Island between 2016 -2017.

Fig 13. Number of Eurasian Nihgt Gare of the order Caprimulgiformes observed in Tuti Island between 2016 -2017.

Fig 14. Number of bird species of the order Accipitriformes observed in Tuti Island between 2016 -2017.

Fig 15. Number of bird species of the order Piciformes observed in Tuti Island between 2016 -2017.

Fig 16. Number of bird species of the order Coraciiformes observed in Tuti Island between 2016 -2017.

Fig 17. Number of bird species of the order Bucerotiformes observed in Tuti Island between 2016 -2017.

Fig 18. Number of bird species of the order Suliformes observed in Tuti Island between 2016 -2017.

Fig 19. Number of bird species of the order Anseriformes observed in Tuti Island between 2016 -2017.

Fig 20. Number of bird species of the order Coraciiformes observed in Tuti Island between 2016 -2017.

5. Conclusion

In total, about 8888 individuals that belonged to 88 species, 20 orders were observed in this study, of these 2 species were in the order Ciconiiformes, , 1 species was in order Accipitriformes.

The four most common birds identified were the House Sparrow (*Passer domesticus*) with 2694 birds identified, followed by the Laughing Dove (*Spilopelia senegalensis*) with 645 birds identified, the Cattle Egret (*Bubulcus ibis*) with 573 birds identified and the black Greater blue eared starling (*Lamprotornis chalybaeus*) with 402 birds identified.

6. Recommendation

1. Annual survey of avifauna of Tuti Island is needed to determine the species availability and numbers,
2. Conservation of the island habitat is necessary through the awareness and control of human activities.

In this study it was concluded that A total of 112 species belonging to 17 orders , 27 species were in the order Passeriformes belonging to 12 families (Passeridae, Sylviidae, Ploceidae, Nectariniidae, Motacillidae, Fringilidae, Estrilidae, Corvidae, Laniidae, Sturnidae, Malaconotidae, Muscicapidae and Pycnonotidae). Among the Passeriformes species belonging to 12 families were recorded, of which Ploceidae (weavers, whydahs and sparrows), Sturnidae (starlings and oxpeckers), Estrildidae (waxbills), Laniidae (shrikes), Motacillidae (wagtails) were most frequently observed.

The park have many factors that affect the number, abundance and distribution of birds species, these factors including: availability of water, food resources, vegetation types, suitable nesting sites and nesting materials and other habitat

component. The various environmental change which take the place in different seasons affect the quality and quantity of food and water which turn reflecting on birds communities. Illegal activities made by local people resident within or in the park edge such as honey collecting set of fire for different purpose and browsing of domestic animals which have been negative effect on birds species this study was conducted in short time, many more species could be identified if the time could be extended in future researches in DNP is rich by birds.

References

- Abdelmageed, S. A. (2008). *A Study on the Flora of tuti island in Khartoum state*. University of Khartoum. Ali, E. H. (2014). Khartoum New Structure plan and urban Enviornemnt. Khartoum: Sudanese Environemnt Conservation Society.
- Benum, L.A. (1999). Threatened birds and rural communities: Balancing the equation. In: Proc. 22 International Ornithology Congress. Durban: pp 1546-- - 1555 (Ed. By N.J. Adams & R.H. Slotow). BirdLife South Africa, Johannesburg.
- Davies, H. R. . (1994). A Rural “ Eye ” in the Capital : Tuti Island. *GeoJournal*, 1994(1949), 387–392.
- Ibrahim, M. B., & Davies, H. R. . (1991). Tuti Island: A rural system in an Urban Locality. In M. E. A. Sin & H. R. Davies (Eds.), *The Future of Sudan's Capital region: A study in the Development and Change*. Khartoum University Press.
- Furness, R.W. & Greenwood, J.J.D. (Eds.) (1993). *Birds as Monitors of Environmental Change*. Chapman & Hall, London, UK.
- Starkley, M. Birnie, N., Cameron, A., Daffa, R. A., Haddelsey, L., Hood, L., Johnson, N., Kapapa, L., J., Mwangomo, E., Rainey, H. & Robinson, W. (2002). Kilombero Wildlife Project – An ecological and social survey in the Kilombero Valley, Tanzania. Kilombero Wildlife Project, Edinburgh.
- Eltyeb, H., Idris, E., Adam, A.Ezalden, T. and Hamed, D(2012). A forest in city: Biodiversity at Sunut forest, Khartoum, Sudan. *The Egyptian Academic journal of biological sciences. Zoology*, 4:199-209.