Some Bird Species Breeding in Wetland Sites at Zalingei, Sudan

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Abstract: This study was carried out on breeding bird species at Zalingei area, Sudan. The objective of this study is to document the bird species breeding at Zalingei area. The Direct observation and road count were used to data collection between April to November 2013 and April to November 2014. The study area was patrolled by car and on foot from 7:00am to 7:00pm, Field binoculars (Samsunglens HD, Tianzhu feng, 8×40, 168ft) and Digital camera Samsung model (DV150F/DV151F/DV155F) were used for observation of birds identification of birds were made using East and Central African birds guide (Williams, 1991 and Sinclair and Peter, 2010). Coordinates of wetlands was done using Global Positioning System (GPS). Total of 37 species, out of 121 species were recorded breeding during the study period. They were distributed in the four sites, in Zalingei 32 species were recorded breeding. 28 species were recorded breeding in Terij and W. Azoom (23 species). But the lower breeding species were seen; (14 species) in Shawa.

Keywords: Breeding Species, Korssi, Zalingei, and Wadi Azoom

1. Introduction

The avifauna of Sudan includes 938 species [10]. In (2000) the Higher Council for Environment and Natural Resources (HCENR), recorded 931 species of birds in the Sudan. On the other hands, the number of species of birds of registered for Sudan following the WICE criterias is 952 [16]. A few records were made in the Darfur. [13] make survey on the birds of North and Central Darfur. [10] studied the Morphometric, wing loading and food of Western Darfur Birds. [11] made the corvidae in the Sudan Republic with special reference to Darfur. [12] pointed that the Environmental changes in Western Darfur over half a century and their effects on the selection bird species. [6] mentioned that the Faunal composition and biogrophy of the clandoid copepods of West- Darfur, Sudan, with the description of Tropodaiptomus asimi. Hydrobiologia. According to [7] one hundred and fifty-two (152) species of birds were recorded in Zalingei District.

2. Materials and Methods

2.1. Study Area

Zalingei area is lies in the west of Jebel Marra in the poor savanna zone between latitudes 12° 30 and 13° 30 North, and longitudes 22°20 and 23° 45 East according [15]. The area includes some wetlands site, these wetlands, can take many forms as Wadis (Streams), water Pools (Permanent and temporary) and small lakes. Four Seasonal streams were identified and measured as: Wadi Azoom, Wadi Areebo, Wadi Glabat and Wadi Dhab-Sharow, these were preformated the main Wetlands of the Zalingei area. Eight water pools and two small lakes were established in the dry season, these pools are: Adam-gola, Fawzei, Hamidia, Saa4, Tarei, Gugoldonga, Rejl-aldafa, and Sarei-olmaly. The lakes are: Zour and Dodei. These wetlands are important habitats for migratory and resident birds, especially water birds, for drinking, nesting, resting and feeding [8].
2.2. Tools and Methods

The study areas were reached and patrolled by a Land Rover car and sometimes patrolled on foot.

Bird species were identified, quantified and presence of nests were recorded. Direct observation and discussions with local people were used to determine avifauna species and their numbers, breeding activities, breeding habitats and feeding location. The survey period covered two years from April to November 2013 (first season) – April to November 2014 (second season). Observations started at 7:00 am and ended at 7:00 pm. However, many visits were carried out in earlier hours and extended to later hours for monitoring some nocturnal species. At every 30 minute intervals, number of birds for each species sighted, were recorded be it perching on trees, flying overhead and for a session of three hours [3, 9].

A field binocular (Samsung lens HD, Tianzhufeng, 8*40, 168ft, 100 yds, coated optics) and an 1 Zoom Digital camera (Samsung model (DV150F/DV151F/DV155F) were used for identification and recording of avifauna. Examination of dead bird species or their parts; their eggs and sighting identification of birds’ sound and tracks were also used to supplement the direct field observations. Many hunters and local people in the area provided some information on birds species (dead) during the survey. Road counts were carried out for identifying bird species. Following methods were used [1-5, 14-15].

3. Results

Total of 37 species, out of 121 species were recorded breeding during the study period. They were distributed in the four sites. In Zalingei 32 species were recorded breeding. 28 species were recorded breeding in Terij. But the low breeding species were seen; in W. Azoom (23 species), and (14 species) in Shawa (Tables 1 and 2). The diversity index showed that the study areas had diverted breeding individual. 2013 was more variation in the number of breeding individual different number of species than 2014 (Tables 1 and 2). Red-billed Quelea was scored the highest numbers of breeding species 36.40% followed by Cattle Egret (20.67%) in first season most of them were bred in Zalingei site, while in second season were scored 26.48% Red-billed Quelea and 27.58% Cattle Egret. The Ground hornbill and Pied Crow scored the lowest numbers of individuals. 2013 was more variation in the number of breeding individual different number of species than 2014 (Tables 1 and 2). Red-billed Quelea was scored the highest numbers of breeding species 36.40% followed by Cattle Egret (20.67%) in first season most of them were bred in Zalingei site, while in second season were scored 26.48% Red-billed Quelea and 27.58% Cattle Egret. The Ground hornbill and Pied Crow scored the lowest numbers of breeding species (0.01). Only one pair of each two species was found in Zalingei site, while not found in other three sites.

| no | Species                  | First season | Wadi-Azoom | Shawa | Terij | total | %    |
|----|--------------------------|--------------|------------|-------|-------|-------|------|
| 1  | Grey Heron               | 56           | 9          | 0     | 0     | 65    | 0.58 |
| 2  | Black-headed Heron       | 379          | 11         | 0     | 73    | 463   | 4.12 |
| 3  | Cattle Egret             | 1974         | 131        | 0     | 219   | 2324  | 20.67|
| 4  | Hammer Kop               | 2            | 2          | 0     | 1     | 5     | 0.04 |
| 5  | Abdim’s Stork            | 211          | 33         | 0     | 19    | 263   | 2.34 |
| 6  | Marabou Stork            | 30           | 0          | 0     | 3     | 33    | 0.29 |
| 7  | Sacred Ibis              | 744          | 118        | 0     | 19    | 881   | 7.84 |
| 8  | Knob-billed Duck         | 4            | 7          | 0     | 1     | 12    | 0.11 |
| 9  | Egyptian Goose           | 2            | 2          | 0     | 1     | 5     | 0.04 |
| 10 | Secretary Bird           | 3            | 1          | 2     | 3     | 9     | 0.08 |
| 11 | Helmeted Guinea fowl     | 9            | 1          | 15    | 10    | 35    | 0.31 |
| 12 | Crowned Crane            | 0            | 0          | 0     | 5     | 5     | 0.04 |
| 13 | Hubara Bustard           | 0            | 0          | 1     | 5     | 6     | 0.05 |
| 14 | Black headed Plover      | 10           | 0          | 4     | 3     | 17    | 0.15 |
| 15 | Four banded-bellied Sand-grouse | 2 | 0 | 6 | 0 | 8 | 0.07 |
| 16 | Grey parrot              | 12           | 4          | 4     | 22    | 42    | 0.37 |
| 17 | Namaqua Dove             | 5            | 8          | 10    | 7     | 30    | 0.27 |
| 18 | Mourning Dove            | 4            | 24         | 29    | 13    | 70    | 0.62 |
| 19 | Red-eyed Dove            | 29           | 58         | 22    | 11    | 120   | 1.07 |
| 20 | Laughing Dove            | 8            | 9          | 3     | 15    | 35    | 0.31 |
| 21 | European bee-eater       | 69           | 9          | 20    | 0     | 98    | 0.87 |
| 22 | Abyssinian Roller        | 20           | 22         | 0     | 7     | 49    | 0.44 |
| 23 | African Hoopoe           | 3            | 0          | 0     | 2     | 5     | 0.04 |
| 24 | Grey Hornbill            | 1            | 0          | 0     | 1     | 2     | 0.02 |
| 25 | Ground Hornbill          | 1            | 0          | 0     | 0     | 1     | 0.01 |
| 26 | Ethiopian Swallow        | 9            | 0          | 0     | 2     | 11    | 0.10 |
| 27 | Cliff Chat               | 29           | 25         | 88    | 84    | 226   | 2.01 |
| 28 | Fan-tailed Raven         | 0            | 0          | 0     | 3     | 3     | 0.03 |
| 29 | Pied Crow                | 1            | 0          | 0     | 0     | 1     | 0.01 |
| 30 | short-tailed Glossy Starling | 4 | 1 | 0 | 0 | 5 | 0.04 |
| 31 | Black-headed Weaver      | 192          | 331        | 232   | 94    | 849   | 7.55 |
| 32 | Speke’s Weaver           | 152          | 214        | 165   | 43    | 574   | 5.11 |
| 33 | Holub’s Golden Weaver    | 10           | 49         | 7     | 13    | 79    | 0.70 |
| 34 | Red-billed Quelea        | 2221         | 0          | 0     | 1871  | 4092  | 36.40 |
protection from predators these agreed with [8]. Shawa site presumably provided and abundant foods, breeding sites and both seasons (11,241 in 2013 and 10,975 in 2014) and 28 out of 37 species breed in it. Both Zalingei and Terij sites all three sites. Terij are showed the highest breeding pairs in study area. This may be due to the fact that this area is rich in food and breeding sites compare to the other sites. Zalingei showed the least breeding pairs (14) and also the least number of breeding pairs (14) and also the least breeding pairs in both seasons, this may be due to the fact that availability of water and food and presence of twenty-nine waterbirds; 12 of them were recorded bred and 43 species were Palaearctic migrants.

| no | Species                     | First season | Second season |
|----|-----------------------------|--------------|---------------|
|    |                             | Zalingei     | Wadi-Azoom    | Shawa | Terij | Total | %   |
| 35 | Cut-throat Finch            | 0            | 0             | 20    | 0     | 20    | 0.18 |
| 36 | Broad-tailed Paradise Whydah| 1            | 0             | 1     | 0     | 2     | 0.02 |
| 37 | House Sparrow               | 73           | 519           | 0     | 204   | 796   | 7.08 |
|    | Total                       | 6270         | 1588          | 629   | 2754  | 11,241| 100  |

### Table 2. Total Number of Breeding Species Recorded in Four Sites of Zalingei Area During(2014).

| no | Species                     | Second season | First season | Second season | Wadi-Azoom | Shawa | Terij | Total | %   |
|----|-----------------------------|---------------|--------------|---------------|------------|-------|-------|-------|-----|
| 1  | Grey Heron                  | 0.63          | 18           | 1             | 3          | 1     | 40    | 1140  | 10.39|
| 2  | Black-headed Heron          | 0.12          | 7            | 0             | 3          | 1     | 40    | 1140  | 10.39|
| 3  | Cattle Egret                | 0.12          | 189          | 0             | 338        | 2903  | 26.45 |
| 4  | Hammer Kop                  | 0.11          | 9            | 0             | 5          | 14    |       |       |     |
| 5  | Abdim’s Stork               | 0.11          | 90           | 0             | 10         | 287   | 2.62  |
| 6  | Marabou Stork               | 0.22          | 23           | 0             | 1          | 24    |       |       |     |
| 7  | Sacred Ibis                 | 0.03          | 923          | 0             | 40         | 1140  |       |       |     |
| 8  | Knob-billed Duck            | 0.05          | 6            | 0             | 3          | 13    |       |       |     |
| 9  | Egyptian Goose              | 0.31          | 2            | 0             | 1          | 12    |       |       |     |
| 10 | Secretary Bird              | 0.11          | 1            | 9             | 1          | 12    |       |       |     |
| 11 | Helmeted Guinea fowl        | 0.32          | 11           | 5             | 16         | 35    |       |       |     |
| 12 | Crowned Crane               | 0.03          | 0            | 0             | 3          | 3     |       |       |     |
| 13 | Hubara Bustard              | 0.05          | 0            | 2             | 4          | 6     |       |       |     |
| 14 | Black headed Plover         | 0.20          | 2            | 11            | 9          | 22    |       |       |     |
| 15 | Four banded-bellied Sand-grouse | 0.01  | 0            | 1             | 0          | 1     |       |       |     |
| 16 | Grey parrot                 | 0.48          | 28           | 2             | 21         | 53    |       |       |     |
| 17 | Namaqua Dove                | 0.31          | 1            | 5             | 19         | 9     | 34    |       |     |
| 18 | Mourning Dove               | 0.59          | 6            | 16            | 20         | 23    | 65    |       |     |
| 19 | Red-eyed Dove               | 1.02          | 36           | 37            | 17         | 22    | 112   |       |     |
| 20 | Laughing Dove               | 0.11          | 2            | 2             | 3          | 5     | 12    |       |     |
| 21 | European bee-eater          | 1.00          | 67           | 13            | 30         | 0     | 110   |       |     |
| 22 | Abyssinian Roller           | 0.42          | 17           | 21            | 0          | 8     | 46    |       |     |
| 23 | African Hoopoe              | 0.09          | 9            | 0             | 0          | 10    |       |       |     |
| 24 | Grey Hornbill               | 0.04          | 3            | 0             | 0          | 1     | 4     |       |     |
| 25 | Ground Hornbill             | 0.03          | 3            | 0             | 0          | 3     |       |       |     |
| 26 | Ethiopian Swallow           | 0.03          | 7            | 0             | 2          | 9     |       |       |     |
| 27 | Cliff Chat                  | 1.41          | 8            | 16            | 71         | 60    | 155   |       |     |
| 28 | Fan-tailed Raven            | 0.03          | 1            | 0             | 0          | 2     | 3     |       |     |
| 29 | Pied Crow                   | 0.04          | 4            | 0             | 0          | 0     | 4     |       |     |
| 30 | short-tailed Glossy Starling| 0.06          | 4            | 3             | 0          | 0     | 7     |       |     |
| 31 | Black-headed Weaver         | 6.90          | 201          | 301           | 185        | 70    | 757   |       |     |
| 32 | Speke’s Weaver              | 5.60          | 166          | 289           | 100        | 60    | 615   |       |     |
| 33 | Holub’s Golden Weaver       | 0.67          | 10           | 30            | 13         | 20    | 73    |       |     |
| 34 | Red-billed Quelea           | 27.58         | 2730         | 0             | 297        | 3.27  |       |       |     |
| 35 | Cut-throat Finch            | 0.25          | 0            | 0             | 27         | 0     | 27    |       |     |
| 36 | Broad-tailed Paradise Whydah| 0.01          | 0            | 0             | 1          | 0     | 1     |       |     |
| 37 | House Sparrow               | 6.98          | 0            | 540           | 0          | 226   | 766   |       |     |
|    | Total                       |               | 7411         | 1776          | 516        | 1272  | 10,975| 100   |     |

4. Discussion

32 species out of 37 species recorded in study sites were in Zalingei site, these numbering 6270 breeding pairs in 2013 and 7411 breeding pairs in 2014. This may be due to the fact that this area is rich in food and breeding sites compare to the all three sites. Terij are showed the highest breeding pairs in both seasons (11,241 in 2013 and 10,975 in 2014) and 28 out of 37 species breed in it. Both Zalingei and Terij sites presumably provided and abundant foods, breeding sites and protection from predators these agreed with [8]. Shawa site showed the least number of breeding pairs (14) and also the least breeding pairs in both seasons, this may be due to carrying capacities (food and breeding sites).

5. Conclusions

Zalingei area is very important habitats for waterbirds due to availability of water and food and presence of twenty-nine waterbirds; 12 of them were recorded bred and 43 species were Palaearctic migrants.

Terij site are showed the highest breeding pairs in study area, 28 out of 37 species breed in Terij site while 14 pair were showed breeding in Shawa site.

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