

*Full Length Research Paper*

# Survey of avifauna of Gombe State University, Gombe, Nigeria

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**A survey of the avifauna of Gombe State University was conducted from January to March 2010, which marks part of the dry season in the area. This was to determine the avifauna composition and diversity of Gombe State University, using the line transects method. A total of 37 bird species belonging to 25 taxonomic groups in 25 families were recorded. This is perhaps the first record of birds of Gombe State University. The study concludes that the Gombe State University Campus holds species of Afro-tropical residents, intra-African migrants and palearctic migrants, thus the protection and conservation of some parts of the campus will serve as a haven for some of the bird species. The survey generated baseline information and data for further research that could cover Gombe State and the entire North Eastern region.**

**Key words:** Survey, avifauna, Gombe State University Campus, Gombe, Nigeria.

## INTRODUCTION

So many people are fond of birds because they are lively, lovely and are everywhere. Birds have characters for easy identification. They are cheeky, shy, gentle, vicious, faithful and faithless. Human beings have studied birds with a greater dedication and intensity than they have lavished on any other group of animals (Ezealor, 2003; Nsor and Adang, 2012).

Birds are excellent indicators of biological diversity. In environments where there are a large number of birds, there are also many organisms. Bird abundance and diversity are possible indices or indicators of how biologically rich an environment or habitat could be. Birds are sensitive indicators of habitat health and conditions (Bibby, 1999). Birds are mobile, moving into and leaving favourable and unfavourable environments respectively. Among birds, are species that are characteristic of particular habitats, environments, vegetation, biotypes and ecosystems. Such species have restricted habitat requirements and are more sensitive to changes in the environment and easily disappear or disturbed as a result of habitat destruction or degradation (Bird life International, 2000; IUCN [Http://www.iucnredlist.org/search](http://www.iucnredlist.org/search)).

Records and information gathered from bird-watching, play important roles in defining public and scientific perceptions of birds and the need to protect them. Bibby (1999) opined that trends in composition (diversity) and number of bird population (abundance) over time are of particular interest to nature conservation.

This is particularly important of the Gombe State University Campus, which has undergone massive and drastic environmental and habitat alterations and modification. The Gombe State University Campus is a very disturbed ecosystem, considering the massive landscaping activities and construction works taking place in the environment. Nevertheless, some areas of the habitat have remained relatively undisturbed and still very natural (Nsor and Adang, 2012).

This survey was thus designed to look at the diversity of bird species in such disturbed and undisturbed areas of the campus, assessing the current status of the avifauna of the Gombe State University Campus, after six years of alteration and modification of the habitat, and to make recommendations as to the effects of habitat alteration and modification on the avifauna, which are biological indicators.

## MATERIALS AND METHODS

### Study area

The Gombe State University was established in 2004 by the Gombe State Government. The university is located

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**Figure 1.** Map of Gombe State University showing areas and habitat types.

at Tudun Wada quarters in Gombe metropolis, the capital city, under Akko Local Government Area, Gombe State, Nigeria, for its speedy development.

The campus is divided into the academic, administrative and residential areas, the date palms and mango plantations, the zoo and some undisturbed areas. The annual rainfall ranges from 850 to 1000 mm, with two distinct seasons. The rainy season starts from May to October and dry season from November to April. Average daily temperatures are 34°C in April and 27°C in August.

The relative humidity ranges from 70 to 80% in August and decreases to about 15 to 20% in December. The natural vegetation is typically that of the Sudano-Sahelian

Savannah, composed of shrubs, herbs, grasses and sparsely distributed trees (Figure 1).

### Sampling techniques

The line transects method of estimating bird populations and diversity described by Bibby et al. (2000) was used. The entire campus was divided into four plots: plots 1, 2, 3 and 4. Each plot was then divided into four transects: transects 1, 2, 3 and 4. This gave a total of 16 transects labeled as follows: 11, 12, 13, 14; 21, 22, 23, 24; 31, 32, 33, 34 and 41, 42, 43 and 44 (11 implies plot 1, transect 1). The first number represents the plot number and the

second number represents the transect number. A day was dedicated to each plot during which two visits were made, one in the morning from 6-10 am and one in the evening from 2-6 pm. During each visit, a walk was taken along each of the four transects in the plot and the species and numbers of birds encountered were noted. Each plot was 40 m wide. The distance between two transects was about 10 m. A pair of binoculars was used for sighting and identifying distant birds. The field guide of Birds of Western Africa by Borrow and Demey (2008) was used for identification of the birds. Photographs of the birds were also taken using a FujiFilm digital camera FinePix A700.

The encountered rate and relative abundance was calculated using the formula:

$$ER = X/Y \times 10$$

Where: ER = Encountered rate; X = Number of birds encountered; Y = Time taken to record them; 10 = The standardizing factor.

The relative abundance of the bird species was done by placing them into categories as shown in the following:

< 5 = Uncommon; 6 - 11 = Common; 12 - 20 = Frequent; >20 = Abundant.

## RESULTS AND DISCUSSION

A total of 37 bird species in 25 taxonomic groups and 25 families were identified (Table 1).

The survey of the birds of Gombe State University Campus was a maiden work of the Biodiversity team of the Department of Biological Sciences, Gombe State University, Gombe, Nigeria.

Information on birdlife in Gombe and the entire North Eastern States is scanty. This work is therefore relevant and timely, considering the global environmental challenges facing the world at the moment. It provides baseline information and data on the avifauna of Gombe State University that could be expanded to cover Gombe State and the entire North Eastern Region of Nigeria. This will give a comprehensive checklist of the birds in this part of Nigeria.

Birds are considered as excellent bioindicators of the health status of the environment. A survey of the birdlife of any environment will definitely give a clue to the health status of that environment in terms of biodiversity. The Gombe State University since its creation in 2004 has undergone drastic habitat destruction, alteration and modification, due to the massive construction works and landscaping activities taking place there. The identification of 37 species of birds in 25 taxonomic groups and in 25 families in this survey, as birds found on the Gombe State University Campus, is a clear indication that the Gombe State University Campus is a healthy environment for both plant and animal life. The Gombe State University Campus can be said to be rich in avifauna because, out of the 181 families of birds known to man globally, the Gombe State University Campus

holds 25 families. This also indicates richness in biodiversity.

It could be interesting and equally exciting to know that some unique bird species exist on the Gombe State University Campus, among which are birds like the Abdim's Stork which is an intra-African migrant, the Yellow Wagtail which is a palearctic migrant, the Melodious Warbler which is also a palearctic migrant and a good number of common resident birds, which can withstand and tolerate altered, modified and degraded habitats and could breed through out the year (Calf, 2002). The Common Bulbul reported in this survey is said to be Africa's omnipresent, most conspicuous and familiar bird (Borrow and Demey, 2008). It is a common resident species which inhabits almost all habitat types except the treeless deserts and the closed forests (Fry et al., 1996; Borrow and Demey, 2008). The IUCN Conservation Status of all the bird species identified was the least concern (IUCN 3.1) (IUCN [Http://www.iucnredlist.org/search](http://www.iucnredlist.org/search)).

Tela (2011) and Adang et al. (2011) identified 60 bird species in 26 families at the Dadin Kowa dam in Gombe. The difference in the number of bird species could be due to the fact that the Dadin Kowa dam comprises both aquatic and terrestrial habitats. The dam thus attracts a good number of birds for breeding, feeding and roosting. It therefore provides a critical habitat for both aquatic and terrestrial birds.

Tanko and Ivande (2006) assessed the impact of habitat alteration on bird species diversity in a relatively undisturbed habitat in Zaria, Nigeria. The study showed that bird species diversity declined from 54 bird species in 31 families to 51 bird species in 29 families. The habitat destruction, alteration and modification resulting from the massive construction works and landscaping activities on the Gombe State University Campus, could lead to such decline in avian diversity over the years, thus the need for regular and continuous monitoring of bird species richness and diversity, through field assessments, as long as the university exists.

The survey is not a complete checklist of the birds of Gombe State University, but is however, a good reflection of the avian richness and diversity of the area. With the current afforestation and greening project of the environmental team, it is believed that more bird species would find habitats suitable for their utilization, hence there is a strong likelihood for more species to be added to this present list.

## Conclusion

The survey has generated baseline data that could facilitate future research, and concludes that the Gombe State University Campus holds species of Afro-tropical residents, intra-African migrants and palearctic migrants; thus the protection and conservation of some parts of the campus will serve as a haven for some of the bird species.

Birds found in the present checklist are a product of only one season field assessment, the dry season,

**Table 1.** Taxonomic groups, families and bird species of Gombe State University, Gombe, Nigeria.

| S/N | Taxonomic group   | Family        | Bird species                 |   | Relative abundance | IUCN Status   |
|-----|-------------------|---------------|------------------------------|---|--------------------|---------------|
|     |                   |               | Common name                  | Scientific name   |                    |               |
| 1.  | Hérons            | Ardeidae      | Black-headed Heron           | <i>Ardeamelanocephala</i>                                 | 6-11               | Least concern |
| 2.  | Egrets            | Ardeidae      | Cattle Egret                 | <i>Bubulcus ibis/Ardeola ibis</i>                         | 12-20              | Least concern |
| 3.  | Storks            | Ciconiidae    | Abdim's Stork                | <i>Ciconiaabdimii/Sphenorynchusabdimii</i>                | <5                 | Least concern |
| 4.  | Kites             | Accipitridae  | Black-shouldered Kite        | <i>Elanuscaeruleus</i>                                    | 6-11               | Least concern |
| 5.  | Goshawks          | Accipitridae  | Gabar Goshawk                | <i>Micronisusgabar/Melieraxgabar</i>                      | 6-11               | Least concern |
| 6.  | Falcons           | Falconidae    | Lanner Falcon                | <i>Falco biarmicus</i>                                    | 6-11               | Least concern |
| 7.  | Lapwings          | Charadriidae  | Black-headed Lapwing         | <i>Vanellustectus/Sarciophorustectus</i>                  | 12-20              | Least concern |
| 8.  | Pigeons           | Columbidae    | Speckled Pigeon              | <i>Columba guinea</i>                                     | >20                | Least concern |
| 9.  | Doves             | Columbidae    | Laughing Dove                | <i>Streptopeliasenegalensis/Stigmatopeliasenegalensis</i> | >20                | Least concern |
| 10. | Doves             | Columbidae    | Black-billed wood Dove       | <i>Turturabyssinicus</i>                                  | 6-11               | Least concern |
| 11. | Plantain eaters   | Musophagidae  | Western grey Plantain-eater  | <i>Criniferpiscator</i>                                   | 12-20              | Least concern |
| 12. | Coucals           | Cuculidae     | Senegal Coucal               | <i>Centropussenegalensis</i>                              | 12-20              | Least concern |
| 13. | Owls              | Strigidae     | Northern white-faced Owl     | <i>Ptilopsisleucotis/Otusleucotis</i>                     | 6-11               | Least concern |
| 14. | Kingfishers       | Alcedinidae   | Grey-headed Kingfisher       | <i>Halcyon leucocephala</i>                               | <5                 | Least concern |
| 15. | Rollers           | Coraciidae    | Abyssinian Roller            | <i>Coraciasabyssinicus/Coraciasabyssinica</i>             | 6-11               | Least concern |
| 16. | Hornbills         | Bucerotidae   | African Grey Hornbill        | <i>Tockusnasutus/Lophocerosnasutus</i>                    | 6-11               | Least concern |
| 17. | Barbets           | Capitonidae   | Yellow-fronted Tinkerbird    | <i>Pogoniuluschrysoconus</i>                              | 6-11               | Least concern |
| 18. | Larks             | Alaudidae     | Crested Lark                 | <i>Galeridacristata</i>                                   | <5                 | Least concern |
| 19. | Wagtails          | Motacilidae   | Yellow Wagtail               | <i>Motacillaflava/Budytesflavus</i>                       | <5                 | Least concern |
| 20. | Bulbuls           | Pycnonotidae  | Common Bulbul                | <i>Pycnonotusbarbatus</i>                                 | >20                | Least concern |
| 21. | Thrushes          | Turdidae      | African Thrush               | <i>Turduspelios/Turduslibonyanus</i>                      | >20                | Least concern |
| 22. | Warblers          | Sylviidae     | Melodious Warbler            | <i>Hippolaispolyglotta</i>                                | <5                 | Least concern |
| 23. | Sunbirds          | Nectariniidae | Pigmy Sunbird                | <i>Hedydipnaplaturus/Anthreptesplaturus</i>               | 6-11               | Least concern |
| 24. | Sunbirds          | Nectariniidae | Scarlet-chested Sunbird      | <i>Chalcomitrasenegalensis/Nectariniasenegalensis</i>     | 6-11               | Least concern |
| 25. | Crows             | Corvidae      | Piapiac                      | <i>Ptilostomusafer</i>                                    | >20                | Least concern |
| 26. | Crows             | Corvidae      | Pied Crow                    | <i>Corvusalbuis</i>                                       | 12-20              | Least concern |
| 27. | Starlings         | Sturnidae     | Purple glossy Starling       | <i>Lamprotornisporpureus/Lamprocoliusporpureus</i>        | 12-20              | Least concern |
| 28. | Starlings         | Sturnidae     | Long-tailed glossy Starling  | <i>Lamprotorniscaudatus</i>                               | 12-20              | Least concern |
| 29. | Sparrows          | Passeridae    | Northern grey-headed Sparrow | <i>Passer griseus</i>                                     | >20                | Least concern |
| 30. | Weavers           | Ploceidae     | Village Weaver               | <i>Ploceuscucullatus/Plesiositagracucullatus</i>          | >20                | Least concern |
| 31. | Estrildid finches | Estrildidae   | Red-cheeked Cordon-bleu      | <i>Uraeginthusbengalus/Estrildabengala</i>                | >20                | Least concern |
| 32. | Estrildid finches | Estrildidae   | Red-billed Firefinch         | <i>Lagnonostictasenegala</i>                              | >20                | Least concern |
| 33. | Estrildid finches | Estrildidae   | Cut-throat Finch             | <i>Amadinafasciata</i>                                    | 6-11               | Least concern |
| 34. | Estrildid finches | Estrildidae   | African Silverbill           | <i>Euodicecantans/Lonchuramalabarica</i>                  | 12-20              | Least concern |

Table 1. Cnt'd.

|     |                  |             |                    |   |      |               |
|-----|------------------|-------------|--------------------|---|------|---------------|
| 35. | Estridid finches | Estrildidae | Bronze Mannikin    | <i>Spermestescucullatus/Lonchuracucullata</i> | >20  | Least concern |
| 36. | Whydals          | Viduidae    | Pin-tailed Whydah  | <i>Viduamacroura</i>                          | 6-11 | Least concern |
| 37. | Indigo birds     | Viduidae    | Village Indigobird | <i>Viduachalybeate/Hypocherachalybeata</i>    | 6-11 | Least concern |

Names are written following Borrow and Demey (2008).

carried out from January to March 2010. It is therefore recommended that regular field assessments be carried out over the years in order to ascertain whether the avian richness and diversity are increasing or decreasing, and to postulate reasons for such increase or decline in richness and avian diversity.

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