

Ornithology and conservation activities in Elizade University: promoting bird and habitat conservation in Nigeria

Taiwo C. Omotoriogun^{1,2*}

¹ Biotechnology Unit, Dept. of Biological Sciences, Elizade University, Ilara-Mokin, Nigeria

² A. P. Leventis Ornithological Research Institute, University of Jos, Nigeria

*Corresponding author's Email: taiwo.omotoriogun@elizdeuniversity.edu.ng

Abstract

Ornithology has a strong impact on the effective conservation of biological diversity; and, the protection of birds and their habitats extend refuge to other species. Although birds have been an integral component of the environment, there is limited public understanding of this bird-environmental relationship and the need for its sustainability. An effective way to sustain this relationship can be through the engagement and integration of the general public including individual, groups, communities, academic institutions and government and non-government institutions, in ornithological activities. This enhances individual understanding of the ecological values of birds, help mitigate non-sustainable human threats to birds, and motivate environmental friendly consciousness. Field training, building capacity, conservation education and awareness creation in ornithology and related fields are usually fundamental steps in this approach; and scientists need to acknowledge the significance of this aspect of their research activities. At the Department of Biological Sciences Elizade University, part of our research activities focused on the conservation and ecology of birds. The objectives are to assess and monitor bird abundance and diversity within the forest and surrounding habitats; embark on conservation education to create awareness for birds and habitats protection and; train individuals and students in ornithology and conservation research skills.

1 Introduction

Despite the significance of the global avifauna and the long traditional understanding of birds in Africa (Johnson, 2005; Muiruri and Maundu 2010), ornithology i.e. the science and study including the knowledge and awareness of birds (Erwin, 1975; Beale 2018) remained unfamiliar to the general public. This might be attributed to limited expertise in the field, and few ornithological research or formal literatures on African

birds (Cresswell, 2017). However, with the emergence of bird-based research institutions and related fields such as conservation biology, ecotourism and wildlife management, attention has focused not only to birds but also biodiversity conservation, translating into the public awareness of biodiversity and related environmental concerns.

Birds are of particular interest in this regard; for example, about 13% (~1469 species) of global bird species are threatened with extinction in the categories of Critically Endangered (15%, 197 species), Endangered (30%, 389 species) or Vulnerable (55%, 727 species) according to the International Union for Conservation of Nature (IUCN) Red List (Bennett and Owens, 1997; BirdLife International, 2013). Africa and its associated island are also known to harbour about 2700 bird species in 111 families, and 1800 species in currently 20 families are endemic to the region. Of these, 311 bird species are of global conservation concern excluding those shared with other continents. Within west Africa, Nigeria holds about 1000 bird species in about 81 families, and respectfully known for important endemic species such as the Anambra Waxbill *Estrilda poliopareia*, Ibadan Malimbe *Malimbus ibadanensis*, Jos Plateau Indigobird *Vidua mayae* and Rock Firefinch *Lagonosticta sanguinodorsalis* (but see Brandt and Cresswell, 2008; Mills, 2010; Abalaka et al., 2010). The entire region holds high bird diversity widely distributed in all available habitats such as savannah, forests, aquatic and human habitations (Borrow and Demey, 2014). Also, the area receives intra-African migrants and is stopover site for most Palearctic birds wintering in Africa (Moreau, 1972; Jones, 1995; Ezealor, 2002).

Recent reports showed that anthropogenic activities are strongest drivers of inexorable habitat degradation, destruction and loss (Geist and Lambin, 2002; Pouliot et al., 2012; Haddad et al., 2015); consequently, the threats and extinction of

many species across the plant and animal kingdoms (IUCN, 2001; BirdLife International, 2012). Broad suits of threats face birds, ranging from agriculture, invasive, logging, persecution and climate change (BirdLife International, 2013). Therefore, Ornithologists have strong impact in birds and biodiversity conservation, through enhancing public understanding of birds and threats including non-sustainable human activities challenging their existence (Vansina, 1990). Training personnel and building capacity in ornithology and related fields can have positive effects on conservation outcomes, but scientists need to acknowledge this role as fundamental part of their research activities (Strigl, 2003; Cresswell, 2017).

Over the past decades ornithological progress has been made in the country through the works of the A. P. Leventis Ornithological Research Institute (APLORI), University of Jos (Cresswell, 2017); however, further effort is required to expand bird study in the region and build networks for the protection and public familiarization of birds. Most areas in Nigeria are currently experiencing human-driven changes; therefore, protection of birds and habitats has become paramount at both the national and local levels. But to tackle the low ornithological awareness amongst the general public requires intensive conservation education and building capacity for bird protection. This is achievable through training individuals, groups and representatives of communities or organizations on bird conservation initiatives.

This report, since 2016, part of our ornithological research activities at the Department of Biological Sciences Elizade University focused on the ecology and conservation of birds, with the specific objectives to assess and monitor bird abundance and diversity; embarks on conservation education to create awareness for birds and habitats protection and; train individuals and students in conservation research skills.

2 Methodology and approach

The study area (Fig. 1) which comprised the Elizade University campus, forest and part of the surrounding communities (Ilara-Mokin, Ikota, Eti, and Mariwo) was estimated to about 15 km² (1500 hectares) in Ifedore Local Government Area of Ondo State. The areas is located between latitude 07° 20'–07° 23' N and longitude 05° 60'–05° 90' E in the Tropical Lowland Rainforest belt of Nigeria, within the Guinean Forests of West African Hotspot. The region experiences

distinct wet (April–October) and dry (November–March) seasons with total annual rainfall of approximately 1800 mm; mean monthly temperature range of 27–30 °C; and mean monthly relative humidity of less than 70%. The vegetation composed trees of economic importance including *Triplochitin scleroxylon*, *Elaise guineense*, *Theobroma cacao*, *Terminalia ivoriensis* and *Mahogany* spp. The area is interspersed with hills and rocky outcrops, and with on-going anthropogenic activities including agriculture, logging, and expanding human settlements.

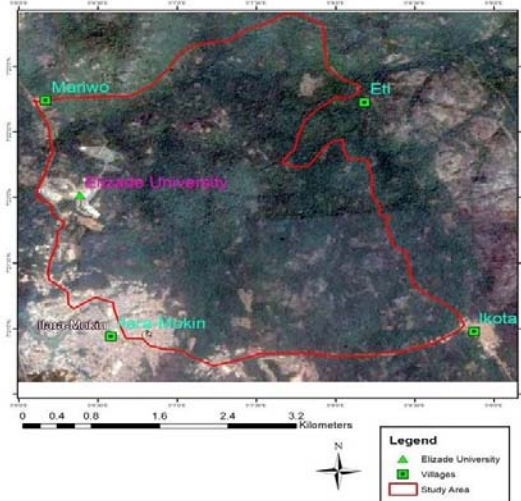


Figure 1 The map of study area (red lines) showing the forest, Elizade campus, and four communities i.e. Ilara-Mokin, Ikota, Eti and Mariwo, at the periphery

Monitoring and bird surveys were carry out using line transect (35 line transects, one kilometer each) across the study area. Birds seen and heard were identified using a pair of binoculars (Savannah Pro 8x42), Telescope (Grandview 16–48x65mm) and a Helm Field Guide, Birds of Western Africa (Borrow and Demey, 2014). The surveys were carried out in the mornings (0600–1000 hours) and evenings (1600–1830 hours) in the dry and wet seasons. Also, birds were caught using interlocking networks of mist-nets (9 m, 12 m and 18 m) mounted at edges and corridors of the forest in the early morning (0600–1100 hours).

Biodiversity education and bird awareness creation were conducted in communities and secondary schools in Ilara-Mokin, Ondo State, after prior notification to the Proprietors and school management. Schools were visited on the designated days with biodiversity conservation team from the Elizade University, to deliver seminars through video illustrations, oral and postal

presentations on the ecology, social values and threats facing birds and habitats in Nigeria. Photos of common species of bird including the English and scientific names were displayed to pupils and staff of schools visited. The use of binoculars and telescopes and bird guide were demonstrated to the pupils and staff. Also, the bird survey team engaged farmer (individual or group) on interpersonal communication during survey periods.

To achieve training individuals and students in ornithological skills, the Elizade University Bird Club (EUBC) and Bird Monitoring and Molecular Research Group (BMMRG) were established in the Department of Biological Sciences Elizade University. The EUBC was intended to engage students and staff on periodic bird viewing and ecotourism expeditions at choice location within or outside the study area. The BMMRG was to motivate and undertake ecological and molecular research on birds at the Department. Also, ornithological training workshop was organized by the Department of Biological Sciences, Elizade University with keynote speakers invited to give talks, make presentation and anchor discussions on designated areas in conservation and ornithology. Both indoor and outdoor activities were carried out to enable understanding of the theoretical and practical aspects of conservation and ornithology. During the indoor activities, powerpoint, illustrative videos, life-sample-display and interactive sections were used to transfer knowledge and information to participants. The outdoor activities were used to illustrate field techniques such as bird viewing, line transect, point count methods, and design research.

3 Outcomes and discussion

3.1 Assessment and monitoring of birds

Since inception of monitoring and bird surveys in the study area, a total of 142 species in 39 families of birds were recorded. Table 1 provides a summary of the bird diversity in the study area.

Sites	Total	Species
Ilara-Mokin	3839	113
Mariwo	2086	87
Ikota	1221	61
Eti	821	51

Table 1 Bird diversity across sites in the study area

The survey effort curve (Fig. 2) as expected did not attain asymptote suggesting that more bird species were yet to be recorded for the study area. This is not surprising, some bird species are difficult to detect especially when such species are nocturnal and shy, and restricted to core part of forest habitat. Also, the method used in survey, weather condition, and identification problems may contribute to poor detection and record of some bird species.

The abundance of bird species varied across sites within the area; Ilara-Mokin had the highest bird abundance and diversity relative to Mariwo, Ikota and Eti. Plausible reasons for this difference maybe variation in habitat types and heterogeneity occurring across the sites. Also, most birds in the ‘generalist group’ use a wide range of habitats in contrast to specialist species which are restricted to favorable areas of the a habitat. Further, diverse farming practices may provide unique characteristics and matrixes enriched with hedges and edge effect that can attract a number of bird species. This can contribute to the variation in bird diversity occurring in the study sites

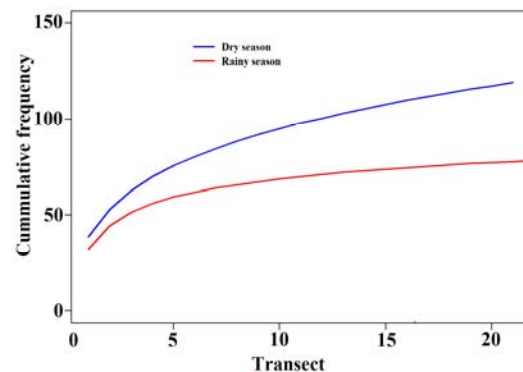


Figure 1 Bird species effort curve for the dry and rainy season surveys

There was the effect of time of day on bird abundance and diversity in the study area; and morning showed higher abundance and diversity than evening. Bird activity is normally high in the early morning; this is also the time of the day most birds sing. More birds can be recorded during this period than any other periods of the day; therefore, creating the impression of bias in survey effort for both mornings and evenings. This is not a surprise, other studies have shown similar trend (e.g. Manu and Cresswell, 2007). Further, dry period had higher bird diversity than wet period. Most Palearctic birds arrive to their wintering ground in Africa, and the study area is one of the stopover sites which experiences in-

flux of these migrating birds during this period. The presence of migrating birds can influence difference in bird diversity between dry and wet seasons. Moreover, variation in environmental conditions across the year dictates sites' suitability for some species (Haddad et al., 2015); for example, changes in vegetation parameters can influence diversity of bird between seasons of the year.

Notably, our surveys recorded some Guinea-Congo Forest Biome Restricted bird species in the study area. There were records of the Ahanta Francolin *Francolinus achantensis*—which is rare and presumed to be a nocturnal species—was heard singing on many times. The Grey parrot *Psittacus erithacus*—Red-listed 'endangered species' by IUCN—was seen in pairs perched and in flight during and after survey periods, and once with a group of four individuals. Also, the Green Turaco *Tauraco persa* was often heard, and seen a few times. Black Bee-eaters *Merops gularis* were seen perched; and Fire-bellied Woodpecker *Dendropicos pyrrhogaster* was also recorded in the study sites.

3.2 Biodiversity education and awareness

In 2017, biodiversity conservation education and awareness was conducted in two secondary schools (Community Comprehensive High School and The Apostolic High School) in Ilara-Mokin. Together, more than 2000 pupils and staff comprising residents within the four communities in the study area was educated on biodiversity conservation (Plate 1).



Plate 1 Biodiversity conservation education seminars at the Apostolic High School, Ilara-Mokin, Ondo State, (a) during video and presentation session, and (b) biodiversity conservation team members, LR: Dr. A.I. Momoh, Dr. T.C. Omotoriogun, Mr S.A. Lawal (front row); LR: Dr A.A. Bada, Mr Uwatt and Mr A.I. Fadahunsi (hind row)

The emphasis was on the ecological role of birds, threat to birds and habitats and biodiversity conservation. Seminars were delivered on these areas using video illustration, oral and poster presentations. It was also demonstrated to the pupils and staff bird viewing techniques (Plates 2). Also, we engaged interpersonal communication on birds with groups of farmers comprising more than 20 individuals during surveys in the study.



Plate 2 Sessions of the outdoor activities, (a) with Dr T.C. Omotoriogun demonstrating the use of binoculars and telescope at the Apostolic High Schools Ilara-Mokin (b) and students looking through the telescope and binoculars at the Community Comprehensive High School, Ilara-Mokin, Ondo State.

Community based conservation initiative is one of the most effective approaches in the conservation of biodiversity. Following the understanding that local communities are inextricably connected to, and use the forest resources for food, medicine, and fuel wood; therefore, a more compre-

hensive approach which includes strengthening the organization and technical capabilities of rural communities as well as support for sustainable resources use are required for sustainable management of natural resources (Takon et al., 2013).

In addition, the orientation of individuals, groups and organizations is invaluable to the successful conservation of bioresources. As for the secondary school pupils, catching them young with environmental consciousness and resources sustainability initiatives have strong significance on how the future generation will perceive and relate with the environment. On the other hand, the group of farmers encountered during interpersonal communication would awaken new perspective and dealing with nature.

3.3 Ornithology training and skill acquisition

The EUBC is growing though activities and participations have been irregular for most members (about 25 registered individuals). APLORI and the Nigeria Bird Atlas Project (NiBAP) have supported and encouraged activities; and the Ondo Bird Club (OBC) was inaugurated during the ornithology workshop held in Elizade University. These two clubs (i.e. EUBC and OBC) plan cooperative effort to continue building capacity for bird conservation and habitat protection in southwest Nigeria as well as organizing birds viewing and ecotourism activities within and outside Ondo State.

The BMMRG is also thriving and growing in the Department of Biological Sciences, Elizade University. The research group is dedicated to mentoring and supervising students and upcoming scientists on bird related research within Nigeria and Africa. The group is keen on interdisciplinary collaborative research; current on-going research works include the birds of Elizade University forest and surrounding habitats; birds as biomonitoring species for environmental quality; and haemosporidia parasites of Afrotropical songbirds.

The Department organized a workshop titled ‘field ornithology: building capacity for more strategic conservation of birds and habitats in Nigeria’, held 10-14 September 2018 (Plate 3). The workshop which attracted more than 70 participants from across Nigeria, featured keynote addresses, presentations and discussions from invited experts in conservation and ornithology from the APLORI Jos, Nigerian Conservation Foundation (NCF), Elizade University Ilara-

Mokin, University of Ibadan, and University of Lagos. Participants were trained in bird identification skills based on sight, song and calls; and the use of optics such as binoculars and telescope, and field guides. The training include the survey and monitoring of birds using standard methods; how to collect and archive bird data, and non-destructive approaches in sampling and bird research.



Plate 3 Participant during the field ornithology workshop held at Elizade University, Ilara-Mokin, Ondo State, (a) a bird viewing expedition with Dr. Talatu Tende (NiBAP) around the Smokin Hills Golf Resort, Ilara-Mokin, Ondo State, and (b) a group photograph of participants with the some executive trainers of the workshop.

4 Conclusion and recommendation

This paper highlights the ornithology and conservation activities at the Department of Biological Sciences, Elizade University. This is part of the effort to promote bird and habitat conservation, and to sensitize the general public on the ecological value of birds in Nigeria. Moreover, the result of our survey showed high diversity of birds in the Elizade University Forest and surrounding habitats. The area is a stopover site for Palearctic birds wintering in Africa. Also,

through our conservation education activities, we built capacity and transferred ornithological skills to a number of students and staff of the Elizade University community, and those from neighboring Universities; and have attracted citizen scientists, ecologists, conservationists, and researchers from across the federation during field ornithology workshop held at the Elizade University. We have also through our activities educated pupils at the primary and secondary schools levels on eco-friendly and environmental custodianship behaviors. Therefore this paper is important for any conservation steps for this area.

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