IJPAES

INTERNATIONAL JOURNAL OF PLANT, ANIMAL AND ENVIRONMENTAL SCIENCES

Volume-6, Issue-3, Apr-Jun-2016 **Coden: IJPAJX-CAS-USA,** **Copyrights@2016 ISSN-2231-4490**

Received: 10th Jan-2016 ***Revised: 27th Mar-2016*** ***Accepted: 5th Apr-2016***

Research article

HABITAT EFFECTS ON AVIAN SPECIES ABUNDANCE AND DIVERSITY IN IDANRE FOREST RESERVE SOUTH WESTERN NIGERIA

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ABSTRACT: Habitat effect on the Abundance and Diversity of avian species was studied in Idanre Forest Reserve, South West Nigeria. The study area was divided into three compartments based on their different land use types. A total of 30 transect lines were randomly laid out and 10 transect lines per a compartment. The minimum distance between two transect lines was 200 m. The number of transect lines was determined by the site size. Data were collected for six month (Dry and Wet seasons) in 20014. Fifty five (55) bird species were recorded in the Farmland, Seventy (70) bird species in the Fallow Area and one hundred and fifteen (115) species encountered in the Undisturbed forest area. In all, a total of 136 bird species belonging to 43 families and 18 orders were recorded in the three study sites, The Order Passeriformes had the highest frequency (51%) of the entire number of birds recorded, while the dominant families were Bucerotidae and Pycnonotidae, comprising (7.4%) of the total species One endangered bird species, African Grey Parrot and 10 species Hornbills were encountered in the study area.

Keywords: Home range; Agricultural intensification; Avian species; Habitat fragmentation.

INTRODUCTION

The increasing disappearance of fauna and flora resources over the years especially as a result of the anthropogenic activities is a great challenge that conservation authorities are facing worldwide. Tropical forests are under threat from large scale forest clearance, mineral extraction and industrialization. For example in Nigeria alone, 184 animal and plant species, as well as valuable natural spaces, including old growth forests and wetlands, are known to be at risk [1]. Furthermore, each year, around 20.4 million hectares (50.4 million acres) of tropical forest are

A total of 56 individual tree species in 16 taxa and 11 families were enumerated in the Farmland, the highest occurring tree species is *Ficus* Sur with 3 individuals sampled. The highest DBH of 101 cm was recorded in *Ficus exasperata* and the highest mean height of 31 m was recorded in *Ficus exasperate*. 96 individual tree species in 28 taxa and 17 families were enumerated in the Fallow Area, the highest occurring tree species is *Ficus exasperata* with 4 individuals sampled. The highest DBH of 145 cm was recorded in *Trculia Africana*. Also the highest mean height of 28 m was recorded in *Ficus exasperata.*

Table 1: Bird Species Composition in the Study Area.

Location	**Species**	**Family**	**Order**
Farmland	55	29	12
Fallow Area	70	27	12
Undisturbed Forest Area	115	36	16

Figure 1: Family Composition of bird species in the Study Area.

A total of 253 individual tree species in 67 taxa and 32 families were enumerated in the Undisturbed Area, the highest occurring tree species is *Musanga cecropidiodes* with 14 individuals sampled, the highest DBH of 462 cm

Table 3: Checklist of Bid Species in the Study Area.

Family	Scintific Name	Common Name
Accipitridae	*Polyboroides typus*	African Harrier Hawk
	Aviceda cuculoides	African Cuckoo Hawk
	Gypohierax angolensis	Palm -Nut Vulture
	Spizaetus africanus	Cassin's Hawk Eagle
	Kaupifalco monogrammicus	Lizard Burzard
	Lophaetus occipitalis	Long Crested Eagle
	Urotriorchis macrourus	Long Tailed Hawk
Anatidae	*Dendrocygna viduta*	White Faced Whistling Duck
Alcedinidae	*Ispidina lecontei*	African Dwarf Kingfisher
	Halcyon badia	Chocolate Backed Kingfisher
Apodidae	*Cypsiurus parvus*	African Palm Swift
	Apus batesi	Bates Swift
	Telacanthura melanopygia	Black Spinetail
	Neafrapus cassini	Cassin's Spinetail
	Rhaphidura sabini	Sabines's Spinetail
Bucerotidae	*Ocyceros griseus*	African Dwarf Hornbill
	Tockus nasutus	Africa Grey Hornbill
	Tockus fasciatus	African Pied Hornbill
	Ceratogymna subcylindricus	Black And White Casqued Hornbill
	Ceratogymna atrata	Black Casqued Hornbill
	Tockus hartlaubi	Blck Dwarf Hornbill
	Ceratogymna fistulator	Pipping Hornbill
	Tockus camurus	Red Billd Dwarf Hornbill
	Ceratogymna albotibialis	White Thinghed Hornbill
	Ceratogymna elata	Yellow Casqued Hornbill
Campephagidae	*Coracina azurea*	Blue Cuckoo Shrike
	Coracina pectoralis	Western Wattle Cuckoo Strike
Capitonidae	*Gymnobucco peli*	Bristle-Nosed Barbet
	Tricholaema hirsuta	Hairy Barbet
	Pogoniulus atroflavus	Red Rumped Tinkerbird
	Gymnobucco calvus	Naked Faced Barbet
	Pogoniulus chrysoconus	Yellow Fronted Tinkerbird
	Pogoniulus bilineatus	Yellow Rumped Tinkerbird
	Pogoniulus subsulphureus	Yellow Throated Tinkerbird
Caprimulgidae	*Macrodipteryx longipennis*	Standard Winged Nightjar
Cisticolidae	*Prinia bairdii*	Banded Prinnia
	Apalis flavida	Yellow Breasted Apalis
	Apalis jacksoni	Black Throated Apalis

	Sheppardia cyornithopsis	Lowland Akalat
Musophagidae	*Corythaeola cristata*	Great Blue Turaco
	Tauraco persa	Green Crested Turaco
Nectariniidae	*Chalcomitra adelberti*	Buff Throated Sunbird
	Hedydipna collaris	Collard Sunbird
	Cinnyris coccinigaster	Splendid Sunbird
	Cinnyris venustus	Variable Sunbird
Numididae	*Guttera pucherani*	Crested Guinea Fowl
Oriolidae	*oriolus hosii*	Black Winged Oriole
Phoeniculidae	*Phoeniculus castaneiceps*	Forest Wood Hoopoe
Phsianidae	*Francolinus lathami*	Latam's Forest Francolins
	Ptiopachus petrosus	Stone Partridge
	Francolinus bicalcaratus	Double Spurred Francolin
Picidae	*Campethera caroli*	Brown -Eared Woodpecker
	Campethera nivosa	Buff Throated Woodpecker
	Dendropicos pyrrhogaster	Fire-Bellied Woodpecker
Pittidae	*Pitta angolensis*	African Pitta
Platysteiridae	*Platysteira castanea*	Chestnut Wattle Eye
	Platysteira cyanea	Common Wattle Eye
	Platysteira concreta	
Ploceidae	*Ploceus melanocephalus*	Black Headed Weaver
	Ploceus cucullatus	Village Weaver
	Malimbus scutalus	Red Vented Malimbe
	Ploceus nigricollis	Black Neck Weaver
	Malimbus erythrogaster	Red Headed Malimbe
	Ploceus tricolor	Yellow Mantled Weaver
Psittacidae	*Psittacus erithacus*	Grey Parrot
Pycnonotidae	*Andropadus ansorgei*	Anssorges Greenbull
	Bleda syndactyla	Common Bristlebill
	Pycnonotus barbatus	Common Bulbul
	Bleda eximius	Green Tailed Bristlebill
	Bleda canicapilla	Grey Headed Bristlebill
	Phyllastrephus icterinus	Icterine Greenbull
	Andropadus virens	Little Greenbull
	Chlorocichla simplex	Simple Greenbull
	Chlorocichla simplex	Simple Leave Love
	Nicator chloris	Western Nicator
Rallidae	*Canirallus oculeus*	Grey Throated Rail
	Crex egregia	African Crake
	Himantornis haematopus	Nkulengu Rail
	Sarothrura pulchra	White Spotted Flutail

Recurvirostridae	*Himantopus himantopus*	Black Winged Stilt
Strigidae	*Strix woodfordii*	African Wood Owl
	Bubo shelleyi	Shelley's Eagle Owl
Sturnidae	*Poeoptera lugubris*	Narrow Tailed Starling
	Lamprotornis purpureiceps	Purple Headed Starling
Sylviidae	*Sylvietta virens*	Green Combec
	Hylia prasina	Green Hylia
	Macrosphenus concolor	Grey Longbill
	Eremomela badiceps	Rufous Crowned Eremomela
Timaliidae	*Illadopsis cleaveri*	Black- Capped Illadopsis
Trogonidae	*Apaloderma narina*	Narina's Trogon
Turdidae	*Alethe castanea*	Fire Tailed Alethe
	Zoothera princei	Grey Ground Thrush
	Alethe diademata	White Tailed Alethe
	Neocossyphus poensis	White Tailed Ant Thrush
Viduidae	*Vidua macroura*	Pin Tail Whaydah

Table 4: Pyto-sociological Parameters of Tree Species in the Four Study Area.

Location	Individual Tree Species	Taxas	Family	Family Highest Occurrence	Tree Species Highest occurrence	Highest DBH (cm)	Mean Height (m)
Farm Land	56	16	11	Leguminosae 4	*Ficus* Sur 3	*Ficus* exexaperata 101	*Ficus* Sur 27
Fallow Area	96	28	17	Moracea 2	*Ficus* exasperata 4	Treculia African 145	*Ficus* exasperata 28
Undisturbed Forest	253	67	32	Meliaceae and Moraceae 6	Musanga cecropidiodes 14	*Ceiba pentandra* 462	*Ceiba pentandra* 34

secondary forests possibly was more homogeneous than near-primary forest. The relative abundance of avian species in the study area was higher in the farmland than the rest study sites. This agrees with previous work by Ref. [23] who also reported high abundance of bird species in cultivated areas, which could be due to food availability. This is also consistent with the result obtained by Best et al. [24] that the extent of change in bird species composition and abundance depends on the specificity of each bird species habitat requirement, in other words the species tolerance to changes to its environment. Species with restricted habitat changes pattern are more vulnerable to changes in land use practices than those occupying a wider variety of environment. From the result of diversity bird species it was higher in the Undisturbed Area (4.64) than the rest two other compartments Fallow Area (4.65) and Farmland (3.65). This result is supported by the previous work were [25] who surveyed bird diversity in Abiriw sacred grove in Eastern Ghana and used Shannon diversity index recorded a value of 4.46 for the grove a near primary forest and 3.36 for the surrounding cultivated areas. The Undisturbed Area is a primary forest with three strata layers, bird species that utilizes tall emergence trees such the (Black and White Casqued Hornbill and Great Blue Turaco) were encountered and bird species that utilizes under story such as the (Little Greenbull, Common Bulbul, White Tailed Aletheetc) were also sighted. This is consistent with MacArthur [26] who reported that diversity increases with the number of layers in the vegetation. In Ref. [27] reported that tropical wet evergreen forest support more rare bird species than other habitats. In Ref. [28] reported that birds select vegetation variables according to the manner by which an individual habitat affects access to food, mates or its vulnerability to predators. This is also in agreement with the report that altering habitats and changing population structure affects avian population. The result also revealed the values for Shannon diversity index, showed that there was no significant difference in bird species diversity between Farmland and Fallow Area, this is expected presumably because of the edge effect in farm land area. This is supported by previous studies, edge effects are described to be remarkably diverse, ranging from changes in species abundance [28,29]. Bird species are important indicators of environmental quality and ecological functionality. In this study, we provided data on the response of bird species to certain structural attributes of a natural forest, such as the presence of mature and heterogeneous forest stands (high level of DBH). This study shows that Undisturbed Forest Area which is near primary forest is the best habitats for the birds as far as the numbers and diversity is concerned. As the most serious loss of the biodiversity value occurs in the transformation of original landscapes to croplands due to human interference [30]. Reduction in habitats quality is thought to be the main underlying causes of the declines in most farmland bird species [31].

In the farmlands we have few trees and less (DBH) resulting in the decline of bird species abundance and richness. This is supported by previous work of Ref. [32,33] who reported that the conversion of greater areas of land to farming has reduced habitat heterogeneity and led to reductions in species richness and declines in bird species which were once common forest species [34-36].