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Bird Species and Flora Diversity, Conservation Strategies of a Degraded Amahor Forest Reserve Igueben Edo state Southwestern Nigeria

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Abstract: 0sterculiaceae has the highest tree species 14 followed by Euphorbaceae 13 tree species.

Key words: Avifauna and flora, diversity habitat fragmentation agricultural intensification, ecological survey and conservation strategies.

INTRODUCTION

The lowland rain forest is a crucial ecological significance area within the tropical region, which is a serious link between natural resources management and agricultural practices (Okosodo, et al, 2016). It's a storehouse or hotspot for the conservation of important species that rural inhabitants mostly depended upon as a source of protein and at an equivalent time serving the deep interest of the conservationists for cove.Logging inevitably results in changes in biodiversity, ideally, these changes should be recognized and accepted before logging commences (Isikhuemen, *et al*, 2020).Trade-offs between costs and profit on one hand and biodiversity gains and loss on the opposite should be recognized explicitly and therefore the selection of other strategies and scenarios negotiated between stakeholders (Leslie, et al2002). The key threats to bird species revolve round the adoption of intensive agricultural management practices (Wilson et al. 2005). Changes in farm practices frequently identified as drivers of avian declines include increased field and landscape homogeneity, shorter crop rotations, loss of semi-natural or non-crop habitat, chemical use, a switch from wet to dry sowing, land drainage, a switch from hay to silage along side earlier harvesting, and therefore the decline within the availability of habitat quality at the sting of ranges (Wilson et al. 2009, Butler et al. 2010). within the future, demands for biofuel crops (Eggers et al. 2009), along side modernization, specialization, and land abandonment (Wilson et al. 2010) are considered to be ongoing drivers of change across Nigeria. Amahor forest reserve is degraded over a period of your timeand these key threats to the bird species are prevalent, thus there's a requirement to hold out this research study to record the bird species and plant species status within the study area. Thus, this research study seeks to explore the differences in bird species diversity in a logged forest within the protected habitat of Amahor Forest Reserve, Edo State

MATERIALS AND METHODS

Study Area

Amahor Forest Reserve (AFR) is found between Latitude 6º 45´ & 6º 48´N and Longitude 6º 12' & 6º 14'E (Figure 1). it's situated on the southern fringe of Amahor town in the Igueben Local Government Area of Edo State. Covering a neighborhood of 15.31 km2, AFR is bound on the north by expansive rubber plantation regrowth fallow vegetation with Amahor waterside (village) at the far end. Within the northwest is that the confluence of Ebah stream and Ossiomo River; and has Ehor Forest Reserve to the west while the union of Agbokoi and Ossiomo Rivers forms a V-shape at the southern boundary. The topography consists of a medley of plateaus and valleys crisscrossed by streams and rivulets. The soil is poorly drained with occasional or partially weathered rock fragments (regolith) which are grave, mottled, or tainted grey to dark brown. Annual rainfall varies between 1600 and 4000 ml, mean annual temperature is 30 °C and therefore the ratio isn't below 40 that in season and 100% during the wet season (Mengistu, and Salami, (2007). The study site experiences a bimodal annual rainfall pattern, between April and July and from September to October, separated by season (Isichei, 1995). Vegetation is predominantly rainforest, including wetlands along the rivers and Panicum maximum dominated open land. Among the common trees are Celtiszenkerii,

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Triplochitonscleroxylon, Antiarisafricana, Pycnanthusangolensis and Antiarisafricana, Pycnanthusangolensis and Alstoniaboonei (Keay 1989). Other non-timber forest products: fuel wood, chewing sticks, medicinal plants, construction and weaving materials, vegetables, and other food materials are exploited from the reserve.

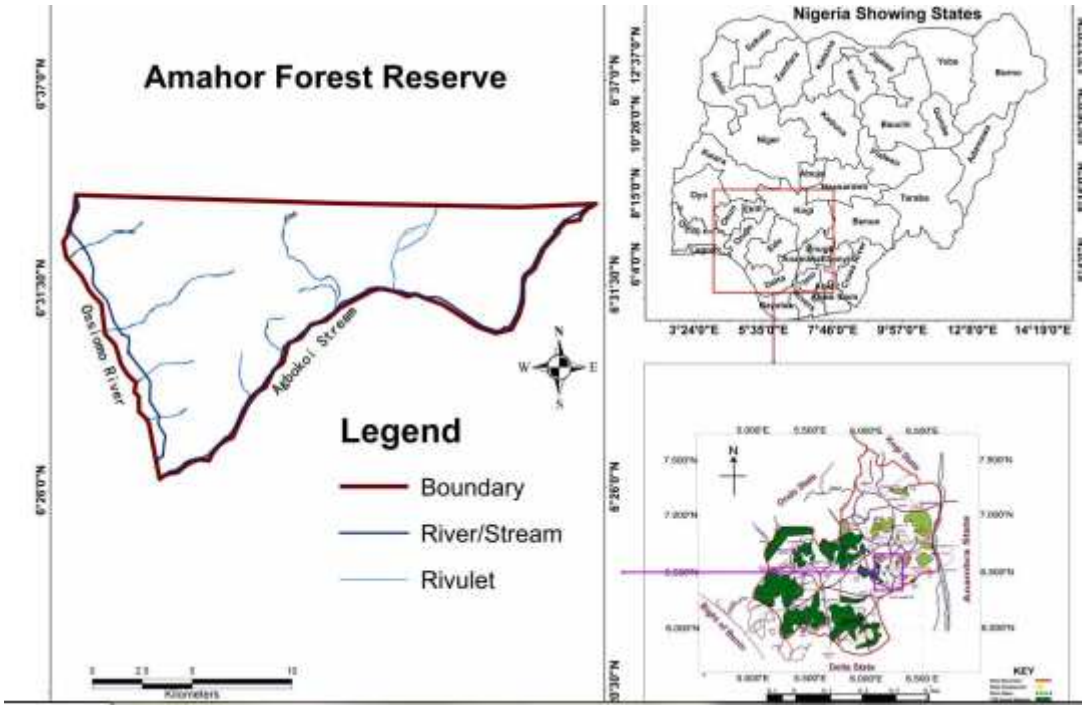

Figure 1, Map of the study area (Source Isikhuemen, *et al*, 2020)

Data Collection

The study area was divided into three compartments for the purpose of this study. Undisturbed forest, secondary forest, and, wetland area. Line transects method (Sutherland, 2009) was used to collect data on bird species diversity in the study area. 10 transect lines were randomly placed in each compartment and in all a total of 30 transect lines were used for this study. Transect lines were walked three times a week for three months in both seasons (May, July and September for wet season and November, January, and March for dry season) of the year.Survey was conducted between 0.600hours and 10.00hours and 1600 hours to 1800 hours.. All birds viewed on the ground or in the vegetation, as well as birds that are flying ahead,were identified and the number in the group recorded. Birds of the same species within 10m of each other were counted in the same group. A pair of binoculars with a magnification 7x 50 was used in the identification of bird species. Distance estimates were obtained by using a digital range finder. Physical features of birds sighted but could not be identified immediately were taken and field guide book of West African birds (Burrow and Demey, 2011) was used to identify the bird species and bird calls was used to confirmed the presence of nocturnal bird species within the study sites Okosodo et al, 2016

Habitat survey

The ecological survey for the floristic study was conducted in March 2020 (Ogunjemite and Oates 2011). . In this study, a total of 15 study plots of about 25 m × 25m Quadrants (500 sq m) size were established. All woody plants with stems rooted independently within a plot and with a DBH (measured at 1.3 m above ground for all life forms) equal to or greater than 2.5 cm were measured, inventoried and identified to species level. Multiple stems were measured separately, but all stems rooting in the same place were counted as one individual. Specimens were collected in April and May 2020. All specimens were sorted to species level and identified by matching them with vouchers identified by specialists or professional botanists. DBH measurement was taken with simple tape measure while height of trees was taken using HagaAltimetre.

Data analysis

Data obtained from the field survey were entered excel (version 15) spread sheet prior to both descriptive (tables, frequency and percentage frequency, graph, pie and bar charts) and analytical statistics Past Model was used to analyzed bird species diversity, SHE analysis floristic composition and. relationship between bird species diversity habitat variables

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RESULTS

A total of 156 bird species belonging 36 families and 18 orders were recorded in the study area, which indicates area the support bird species diversity. One hundred and (125) bird species were recorded in the secondary forest compartment, Wetland compartment(16) bird species and undisturbed forest compartment (6) bird species Figure 2. Family composition showed that the Pycnonotidae **has the highest bird species in the study area which is followed by the family Estrildidae Figure 3.** One endemic bird species *Malimbusibadanesis* and one rare species of weaver *ploceus tricolor* were encountered during the field survey. TheShannon_Hdiversity index was higher during dry season (5.011) than wet season (4.976), which indicates influx of migrants bird species to the study area Table 1. The highest occurring tree species are ***FicusEsasperata,*** and ***Ceibapentandra*** with 36 and 19 tree species respectively. DBH of 466cm was recorded in ***FicusEsasperata***followed ***FicusLatifolia*** 456 cm in the study area. .Also the highest mean height of 41m was recorded in Milliciaexcelsa and the highest occurrence of tree species was recorded in Brachystegiaeurycoma 39.Shannon_H diversity was 4.849 in the study area. The result of the family composition indicates that sterculiaceae has the highest tree species 14 followed by Euphorbaceae 13 tree species.

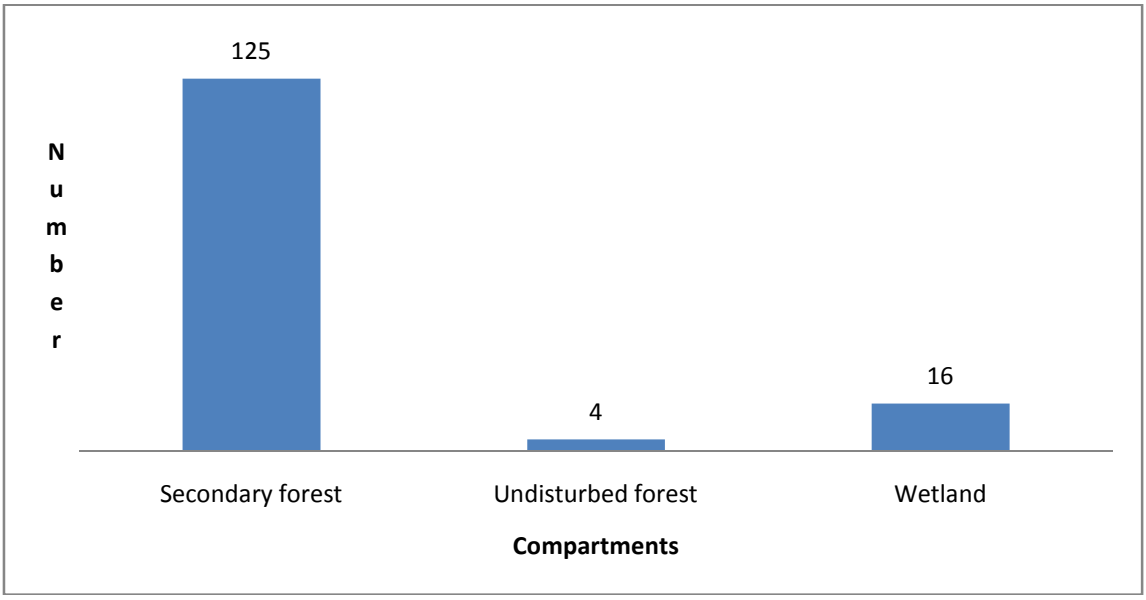

Figure 2, Bird species in each compartment in the study area

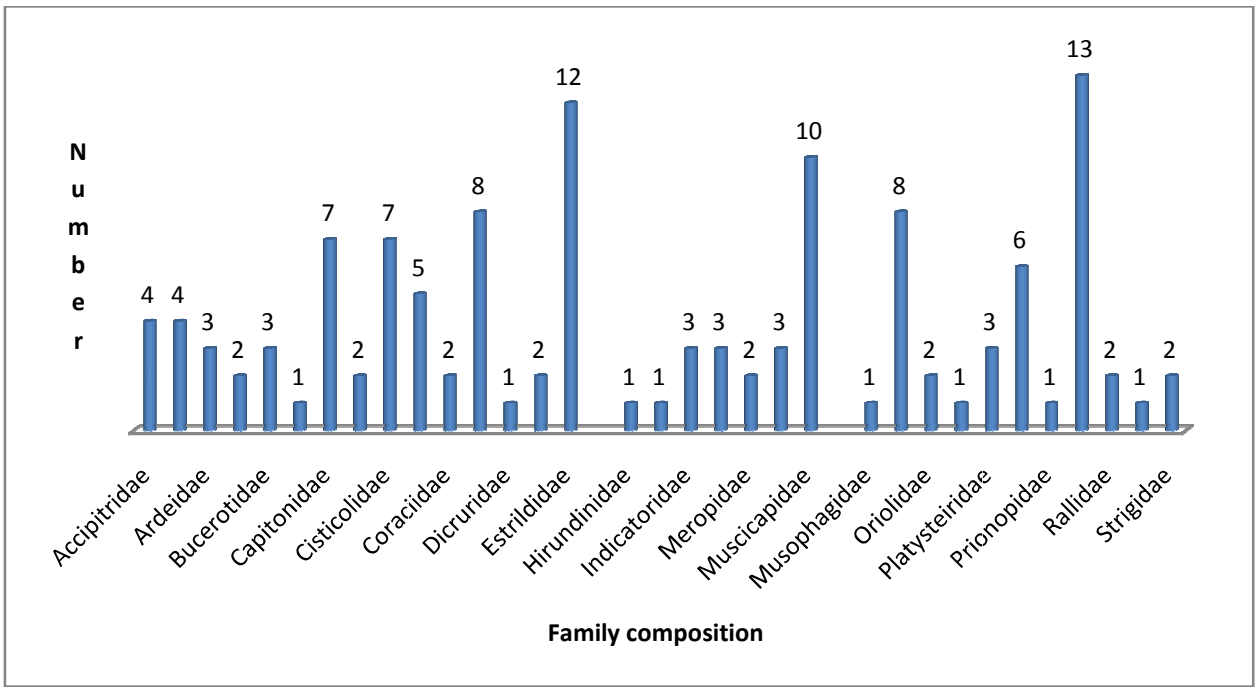

Figure 3, Family composition of bird species in the study area

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Table 1, Diversity index of bird species in the study area

Diversity Index	Dry Season	Lower	Upper	Wet Season	Lower	Upper
Taxa_S	156	152	155	147	132	145
Individuals	402	402	402	280	280	280
Dominance_D	0.006881	0.008119	0.009109	0.006964	0.008801	0.01026
Shannon_H	5.011	4.855	4.917	4.976	4.731	4.845
Evenness_e^H/S	0.9684	0.834	0.8835	0.986	0.8399	0.8875
Brillouin	4.476	4.348	4.399	4.319	4.144	4.219
Menhinick	7.731	7.581	7.731	8.785	7.889	8.665
Margalef	25.68	25.18	25.68	25.91	23.25	25.56
Equitability_J	0.9936	0.964	0.9754	0.9972	0.9646	0.9758

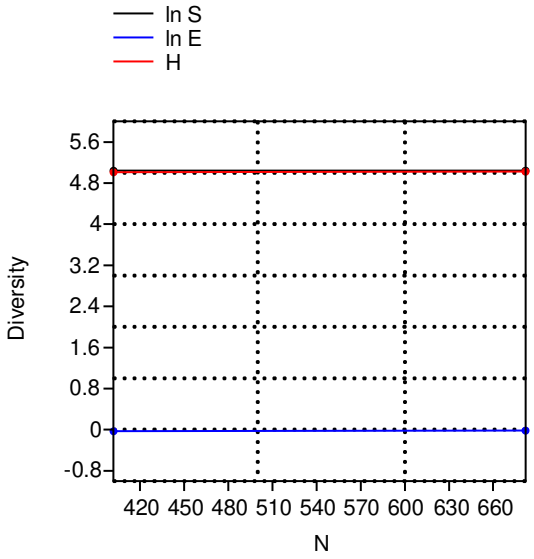

Figure 4, SHE analysis of bird species in the study area

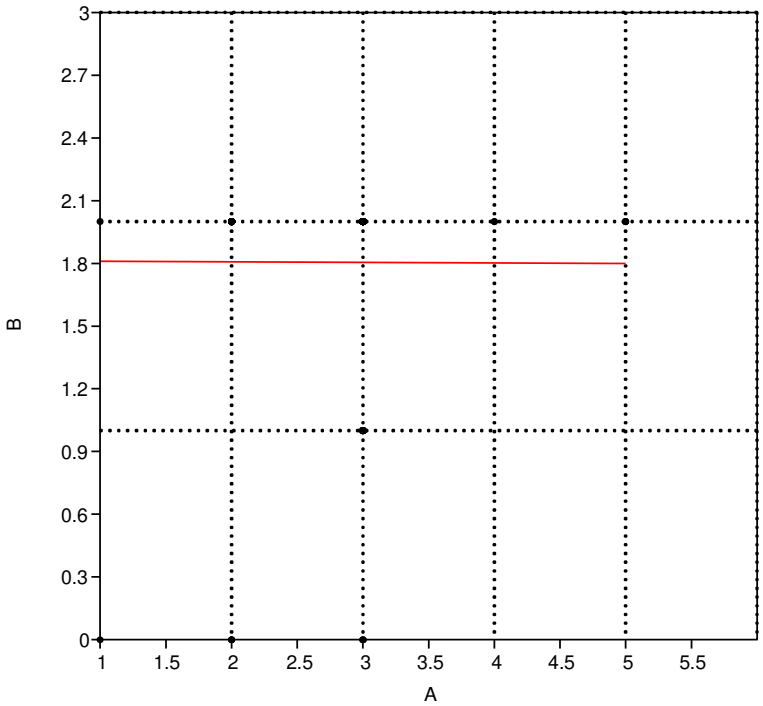

Figure 5. Densities of bird species against habitat variable in the study area

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DISCUSSION

The modification in the habitat by human activities affected the bird species diversity recorded in the study area. One hundred and twenty five (125) bird species enumerated in the study area were secondary forest andfallow land bird species. This finding is consistent with (Isikhuemen, *et al,* 2020) who reported low diversity due massive logging, poaching and faming in the same Amahorforest reserve. The result of the family composition in the study area indicate that Pycnonotidae has 13 bird species which was followed by Estrildidae has 12. These families which bird species utilized secondary forest and fallow land. This suggests that the anthropogenic activities took place in the area this is consistent with who reported that in the absence of good forest management planning, illegal and/or uncontrolled logging leads to the loss or destruction of forests; and the concomitant habitat and biodiversity losses threaten the survival of important flora and fauna species (FAO and UNEP, 2020).One endemic species Malimbusibadanensis and rare species of weaver Ploceus tricolor were recorded in the study area, the watershed This result agrees from many studies conducted in various forest ecosystems around the world, for example boreal pine in Canada (Venier and Pearce, 2005), Mediterranean oak and pine in Spain (Gil-Tena et al., 2007) and eucalypt in Tasmania (Hingston and Grove, 2010).This also agrees with(Sustainable Ecosystems Institute (20017) who reported that serious loss of the biodiversity value occurs in the transformation of original landscapes to croplands due to human interference. The diversity index showed that it was higher in the dry season (5.011) than wet season (4.976). This is probably due to migratory birds species that utilized the wetland area during the dry season. Example of such of migratory bird species are Common Redshank, Common Sandpiper, Common Greenshank,Collared, Pratincole, Grey Pratincole Pied Flycatcher, and African Grey Hornbill. As a result of the disturbance taking place in the study area these bird species are threatened. This agrees with (Wilcove and Wikelski 2008) who reported that worldwide migratory birds have suffered population declines and range constriction due to increase in anthropogenic pressures. Growing evidence links this to agricultural expansion (Inouye et al. 2000, Murphy 2003). The SHE analysis was used to examines the relationship between richness and the Shannon-Wiener diversity index) and (evenness as measured using the Shannon-Wiener evenness. The result indicates that was positive relationship between the species richness and species evenness in the study area Figure3, The density of bird species and habitat variables was positive, majority of bird species encountered as core forest bird species have move out of the study area.

The result of the ecological survey carried out showed the most econ3mic trees have been cut down. This resulted the to the study area becoming a secondary forest which has low DBH, Low mean height and most trees left unlogged are fruit trees, example are FicusEsasperata, FicusglumosaFicusglumosa,, FicusthoniigiiFicussur, which affected bird species in the study area. Most forest bird species that utilized forest ecosystem have move away from the area, bird species such as Black Casqued Hornbill, Black and White Casqued Hornbill, Great Blue Turaco, Crested Guinea fowl Frasser Owl were not sighted in the study area. This observation agrees with Usher (2009) reported that diversity is the most frequent adopted criteion for evaluation of conservation schemes and that diversity indicies correlated with stability of the ecosystem and will be high in biologically protected areas. Deforestation such as logging, firewood collection, charcoal making cutting of raffia palm, cutting coco nut, agriculture (bush burning, use of herbicides and destruction of out- growth shrubs) and soil excavation are major activities that caused major changes in the ecosystem. This finding is consistent(Ajonina, and Usongo, (2001)with for, agriculture, farming, drainage destruction of wetlands, human settlement, the building of infrastructures and industries among others have altered lots of habitats Myers (2002) reported that the loss of tropical ecosystem is of particular concern because the biome contains over half of the world species. Many studies have examined the impact of habitat loss and fragmentation due to agriculture on tropical bird communities (Okosodo, et al, 2019).

CONCLUSION AND RECONMENDATION

The presence of some endangered and threatened bird species in the study area is a sign of hope. However, their conservation must be guaranteed and that will only be achieved by the conservation of extensive areas of natural vegetation.

The conservation strategy must integrate the physical, economic, social and cultural condition of the farmers and Local people so as to come up with innovations and technologies that conserve and sustain biodiversity. The research strategy must integrate the physical, economic, social and cultural condition of the farmers so as to come up with innovations and technologies that conserve and sustain biodiversity.

To maintain the avifauna diversity of the area, land use planning that both protects the native tree species and emphasizes on bird-friendly landscape design may enhance avian and tree species diversity within the area.

Strict law enforcement on farming practices that will have negative effects on avifauna in the study area should be discouraged community education and promotion of alternative income-generating activities should be encouraged and community education and promotion of alternative income-generating activities should be encouraged.

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All forms of exploitation or logging activities should be prohibited; concerted effort should be made to establish source of income. This should go hand in hand with the restoration of the ecosystem through reforestation is most degraded areas by enrich process

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Appendix 1, Bird species recorded in the study area

Family	Scientific Name	Common Name
Accipitridae	Aquila africana	Cassin's hawk Eagle
	Kaupifalcoonogrammicus	Lizard Buzzard
	Polyboroidestypus	African Harrier Hawk
Alcedinidae	Ceyxlecontei	African Dwarf Kingfisher
	Halcyon badia	Chocolate-Backed Kingfisher
	Halcyon malimbica	Blue-Bresated Kingfisher
	Halcyon senegalensis	Woodland Kingfisher
Apodidae	Cypsiurusparvus	African Palm Swift
	Apusaffinis	Little Swift
Bucerotidae	Tockusfaciatus	African Pied Hornbill
	Lophocerosnasutus	African Grey Hornbill
	Bycanistesfistulator	Piping Hornbill
	Horizocerusalbocristatus	white-Crested Hornbill
Campephagidae	Cyanograucalusazureus	Blue Cuckoo Shrike
CapitonidaeLybiidae	Tricholaemahirsuta	Hairy-Breasted Barbet
	Pogoniulusatroflavus	Red-RumpedTinkeredbird
	Gymnobuccocalvus	Naked-Faced Barbet
	Pogoniulusscolopaceus	Speckled Tinkerbird
	Pogoniuluschrysoconus	Yellow-Fronted Tinkerbird
	Gymnobuccopeli	Bristled-Nosed Barbet
	Pogoniulussubsulphureus	Yellow-Throated Tinkerbird
Caprimulgidae	Caprimulguslongipennis	Standard-Winged Nightjar
	Caprimulgusnigriscapularis	Black-Shouldered Nightjar
Cisticolidae	Bathmocercuscerviniventris	Black-Head Rufous Warbler
	Cisticolaerythrops	Red-Faced Ccisticola
	Camaropterachloronota	Olive-Green Camaroptera
	Priniabairdii	Banded Prinia
	Camaropterabrevicaudata	Grey Backed Camaroptera
	Priniasubflava	Tawny- Flanked Prinia
	Apalisjacksoni	Black Throated Apalis
Columbtdae	Treroncalvus	African Green Pigeon
	Turturbrehmeri	Blue Headed Wood Dove
	Spilopeliasenegalensis	Llaughing Dove
	Streptopeliasemitorquata	Red Eyed Dove
	Turturtympanistria	Tambourine Dove
Coraciidae	urystomusglaucurus	Broad Billed Roller
	Coraciasabyssinicus	Abyssinian Roller
	Coraciascyanogaster	Blue Bellied Rolle
Cuculidae	Chrysococcyxcupreus	African Emerald Cuckoo
	Centropusgrillii	Black Coucal
	Cuculusclamosus	Black Cuckoo
	hrysococcyxcaprius	Diederik Cuckoo
	Cercococcyxmechowi	Dusky Long-Tailed Cuckoo
	Chrysococcyxklaas	Klaas's cuckoo
	Centropussenegalensis	Senegal Coucal
	Ceuthmocharesaereus	Yellowwbill
Dicruridae	Dicrurusadsimilis	Fork-Tailed Drongo
Estrildidae	Spermestes bicolor	Black-and-White Mannikin

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	Nigrita bicolor	Chestnut-Breasted Nigrita
	Nigritacanicapillus	Grey-Headed Nigrita
	Nigritaluteifrons	Pale-Fronted Nigrita
	Lagonostictasenegala	Red-Billed Firefinch
	Cryptospizareichenovii	Red-Faced Crimsonwing
	Spermophagaruficapilla	Red-Headed Bluebill
	Spermophagahaematina	Western Bluebill
	Nigritafusconotus	White-Breasted Nigrita
	Parmoptilarubrifrons	Red-Fronted Antpecker
	Parmoptilawoodhousei	Woodhouse's (Red- Headed) Antpecker
	Spermestescucullata	Spermestescucullatus
Hirundinidae	Cecropissemirufa	Red-Breasted Swallow
	Prodotiscusinsignis	Cassin's honeyguide
	Dryoscopussenegalensis	Red-Eyed Puffback
	Malaconotuslagdeni	Lagden's Bush Shrike
Malaconotidae	Dryoscopussabini	Large-Billed Puffback
	Dryoscopussabini	Sabine's Puffback
Meropidae	Meropsgularis	Black Bee-Eater
	Meropspusillus	Little Bee- Eater
	Meropsalbicollis	White-Throated Bee- Eater
Monarchidae	Myiagracastaneigular	Chestnut -Capped Flycatcher
Muscicapidae	Fraseriaocreata	African Forest-Flycatcher,
	Trochocercusnitens	Blue- Headed Crested Flycatcher
	Cossyphacyanocampter	Blue- Shouldered Robin- Chat
	Stiphrorniserythrothorax	Forest Robin
	Cercotrichasleucosticta	Forest Scrub Robin
	Sheppardiacyornithopsis	Lowland Akalat
	Ficedulahypoleuca	Pied Flycatcher
	Muscicapainfuscata	Sooty Flycatcher
Musophagidae	Tauracopersa	Guinea Turaco
Nectariniidae	Cinnyrischloropygius	Olive-Bellied Sunbird
	Chalcomitraadelberti	Buff-Throated Sunbird
	Hedydipnacollaris	Collard Sunbird
	Cyanomitraverticalis	Green-Headed Sunbird
	Anabathmisreichenbachii	Reichenbach1's Sunbird
	Sheppardiacyornithopsis	Splendid Sunbird
	Cinnyriscoccinigastrus	Supberb Sunbird
	Cinnyrisvenustus	Variable Sunbird
Oriolidae	Orioluslarvatus	Western Black-Headed Oriole
	Oriolushosii	Black-Winged Oriole
Phoeniculidae	Phoeniculuscastaneiceps	Forest Wood- Hoopoe
Platysteiridae	Platysteiracastanea	Chestnut Wattle-Eye
	Megabyasflammulatus	African shrike-flycatcher
	Platysteiracyanea	Common Wattle-Eye
Ploceidae	Malimbusrubricollis	Red- Headed Malimbe
	Ploceusnigerrimus	Velliot's Black Weaver
	Malimbusscutatus	Red-Vented Malimbe
	Ploceus tricolor	Yellow Mantted Weaver
	Ploceuscuculatus	Village Weaver
	Malimbusibadanensis	Ibadan Malimbe
Prionopidae	Prionopscaniceps	Red Billled Helmet-Strike
Pycnonotidae	Eurillasansorgei	Ansorge'sgreenbul
	Bledasyndactylus	Red-Tailed Bristlebill
	Pycnonotusbarbatus	Common Bulbul
	Bledaeximius	Green-Tailed Bristlebill

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	Baeopogon indicator	HoneyguideGreenbul
	Phyllastrephusicterinus	IcterineGreenbul
	Eurillasvirens	Little Greenbul
	Eurillascurvirostris	Plain Greenbul
	Chlorocichla simplex	Simple Greenbul
	Phyllastrephusscandens	Red-tailed leaflove
	Nicatorchloris	Western Nicator
	Eurillaslatirostris	Yellow Whiskered Greenbull
Rallidae	Sarothrurapulchra	White Spotted Flutail
	Gallinulachloropus	Common Moorhen
Recurvirostridae	Himantopushimantopus	Black-Winged Stilt
Strigidae	Strixwoodfordii	African Wood Owl
Sturnidae	Poeopteralugubris	Narrow-Tailed Starling
	Hylopsarpurpureiceps	Purple-Headed Starling
Macrosphenidae	Sylviettavirens	Green Combec
Hyliidae	Hyliaprasina	Green Hylia
Macrosphenidae	Macrosphenusconcolor	Grey Longbill
Cisticolidae	Eremomelabadiceps	Rufous- Crowned Eremomela
Muscicapidae	Alethecastanea	Fire Crested Alethe
Turdidae	Geokichla prince	Grey Ground Thrush
Muscicapidae	Alethediademata	White-Tailed Alethe
Turdidae	Neocossyphuspoensis	White-Tailed Ant Thrush
Viduidae	Viduamacroura	Pin-Tail Whaydah
Zosteropidae	Platysteiraconcreta	Yellow White Eye
Scolopacidae	Tringanebularia	Common Redshank
	Tringatocanus	Redshank
	Tringaerythropus	Spotted Redshank
	Tringaochropus	Green Sandpiper
	ActitisHypoleucos	Common Sandpiper
	Calidris alba	Sanderling
Charadriidae	Charadriustricollaris	Three Banded Plover
	Charadriusforbesi	ForberaessPlo
	Charadriuspecuarious	kittlitzs Plover
	Charadriushiaticula	Common Ring Plover
	Charadriusalexandrinus	Kentish Plover
	Vanelluslugubris	Lesser Black Winged Lapwing
	Vanallusspinosus	Spur Winged Lapwing
	Vanallussenegallus	African Wattled Lapwing
Glareolidae	Glareolapratincola	Collard Pratincole
	Glareolacinerea	Grey Pratincole
Scopidae	Scopus umbretta	Hamerkop
Ardeidae	Ardea alba	Great Egret
	Egrettagarzetta	Little Egret
	Butoridesstriata	Green-Backed Heron

Appendix 2, Trees species recorded in the study area

Name of Tree Species	DBH	MH	Frequency
Adenostemmaperrotteii	35	13	7
Adenialobate	43	17	6
Adenostemmaperrotteii	40	19	2
Afzelia Africana	233	34	9
Albizacoriaria	188	31	1
Albizagummifera	199	29	8
Albiziaferruginea	212	32	19
Albiziazygia	246	32	6

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Allanblackia floribunda	178	35	4
Alstoniaboonei	280	31	4
Alstoniacongensis	145	30	6
Altrocarpusheterophylla	47	17	9
Amphimaspterocarpoides	190	29	2
Anarcadiumoccidentalis	57	17	6
Angylocalyxzenkeri	133	28	8
Anonamuricata	34	14	6
Anonidiummanni	48	18	4
Anopyxisklianeana	67	21	5
Anthoceleistanobilis	76	24	3
Anthonothamacrophylla	59	21	4
Antiarisafricana	233	35	3
Antiariswelwitschii	222	36	2
Antrocaryonmicraster	97	28	5
Aristolochinaningens	111	27	4
Artocarpusattilis	79	27	7
Aviceniagermirans	87	30	5
Azadirachtaindica	99	24	9
Balaniteswilsonana	43	13	5
Baphianitida	110	28	7
Bateriafistulosa	57	21	4
Berliniagrandiflora	77	25	8
Berlinia SPP	65	25	3
Bidenspilosa	14	8	3
Blighiasapida	122	27	2
Blighiawelwithil	34	12	6
Bombaxbrevicuspe	133	28	6
Bosqueiaangolensis	112	22	6
Brachystegiaeurycoma	431	35	13
Brachystegianigerica	344	39	19
Brideliaferruginea	375	21	4
Brideliamicrantha	57	24	6
Bryophyllumpinnantum	89	21	9
Canariumschweinfurthii	76	21	7
Carpolobialutea	64	23	4
Cassia alata	10	8	5
Cassia hrusta	87	24	7
Cathiumhispicum	66	21	9
Ceibapentandra	398	35	36
Celtisaldolfi- friderici	98	23	4
Celtismildibraedii	56	21	5
Celtismildibraedii	87	23	6
Celtiszenkeri	111	21	5
Chrysophyllumabidun	231	31	4
Chrysophyllumdelevoyi	234	30	4
Chrysopyllumafricana	67	21	5
Cissampelosmucronata	41	20	2
Cleistopholis patens	65	21	8
Cola acuminate	110	25	8
Cola ginganta	221	31	8
Cola lateritia	245	31	8
Cola melleni	64	21	5
Combretodendronmacrocarpum	131	24	8
Cordiamillenii	132	25	5

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Crescentiacujete	46	20	11
Cylicodiscusgabunensis	76	26	6
Cymbopogoncitratus	99	27	0
Spathodeacompanulata	132	21	8
Daniellaogea	341	34	4
Deinbollia piñata	88	24	5
Desplatsiasubericarpa	42	21	3
Dialiumguineense	131	24	9
DIoprosnigerica	121	23	6
Diospyrosalboflavescens	67	21	7
Diospyrosdendo	55	20	9
Diospyrosmesipiliformis	62	25	6
Distemonanthusbenthamianus	87	26	6
Elaesisguineesis	110	27	6
Entada Africana	122	28	9
Entandrophragmaangolense	365	34	7
Entandrophragma utile	366	38	19
Erythrophleumsuaveolens	174	25	6
Fagaramacrophylla	95	21	4
Ficussur	133	27	5
Ficuscapensis	121	23	5
FicusEsasperata	466	39	36
Ficusglumosa	98	25	0
Ficusglumosa	57	21	0
Ficuslatifolia	456	20	3
Ficusthoniigii	54	21	3
Funtumia Africana	136	28	14
Funtumia elastic	90	23	3
Garcinia kola	122	21	3
Gossweilorodendronbalsaminiferum	34	14	1
Grewiavenusta	43	20	2
Guareacedrata	79	27	1
Guibourtia sp.	89	23	1
Halleacilata	38	12	1
Hannoaklaineana	76	23	1
Heveabrasiliensis	85	25	1
Homaliumaylmeri	39	11	1
Hunteria umbellate	63	23	2
Hymenostegiaafzelii	42	21	2
Icacinatrichantha	56	23	1
Irvingiagabonensis	172	28	2
Irvingiagrandifolia	129	30	1
Khayaivorensis	34	12	1
Kigelia Africana	199	32	3
Lanneawelwitschi	73	23	2
Lonchocarpusgriffonianus	72	21	5
Lophiraalata	401	29	1
Lovoatrichilioides	155	21	1
Maesobotryabateri	122	24	2
Maesopsiseminii	26	8	7
MagniferalIndical	67	26	1
Memocylonblakeoides	210	34	8
Miliciaexcelsa	239	45	3
Milleticecerriceus	56	24	2
monodoramyristica	45	21	1

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Musangacecropioides	131	21	1
Myrianthusarboreus	133	23	3
Napoleoneavogelii	98	20	2
Naucleadiderrichii	67	22	13
Nesogordoniapapaverifera	79	20	5
Newbouldialaevis	73	21	5
Ntrocaryonmicraster	84	22	1
Okoubakaaubrevillei	54	21	1
Olaxsubscorpioidea	59	20	1
Oxytenantheraabyssinica	78	21	2
Pachyelasmatessmannii	53	20	2
Panda oleasa	45	21	3
Pausinystaliamacroceras	87	24	2
Pentaclethramacrophylla	99	23	3
Pentaclethramacrophylla	87	26	3
Pentaclethramacrophylla	84	27	1
Pentadesmabutyracea	55	21	3
Piptadeniastrumafricanum	145	29	1
Polyalthiasuaveolens	34	8	2
Polyceratocarpusparviflorus	122	23	1
Psidiumguajava	13	5	1
Pterocarpussoyauxii	28	7	3
Pterocarpusosun	117	26	2
Pycanthusangolensis	231	39	1
Rauvolfiavomitoria	98	24	1
Ravolfiatraphylla	23	7	2
Ricinodendronheudelotii	32	9	3
Rothmanniahispida	67	24	1
Saacharumofficinarum	14	7	1
Scottelliacoriacea	54	20	3
Snysepalumdulcificum	13	9	1
Sopondiamombin	63	21	3
Spathodeacampanulatu	46	22	1
Staudtiastipitata	76	20	2
Sterculiaoblonga	49	21	3
Sterculiatragacantha	54	22	2
Sterculliacoriata	34	23	1
Stombosiagrandifolia	53	28	1
Strombosia postulate	63	27	3
Tabernaemontanapachysiphen	122	29	1
Terminaliaivorensis	143	29	4
Terminaliasuperba	167	30	2
Tetracarpidiumconophorom	112	21	1
Tetrapleuratetaptera	143	25	2
Theobroma cacao	13	7	6
Tramaorientalis	25	10	2
Treculia Africana	175	30	4
Trichilialanata	54	21	1
Trichiliaprieuriana	54	21	1
Triplochitonscleroxylon	257	37	4
Triumfettapentandra	38	21	2
Uvariopsisdioica	11	5	4
Xylopiaaethiopica	29	17	4

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