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CURRENT STATUS OF AVIFAUNA IN THE TOS CLASSIFIED FOREST (CENTRE-WEST, COTE D'IVOIRE)

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ABSTRACT

The aim of this study was to gain an understanding of the avifauna population in the Tos classified forest with a view to contributing to its sustainable management. Inventories were carried out using listening points, capture and recapture with mist nets and along linear transects. A total of 137 bird species belonging to 44 families in 15 orders were inventoried. The most diverse family is the Accipitridae. Bird species with special status included the Endangered Psittacus timneh, the Vulnerable Bycanistes cylindricus, and the Near Threatened species Bycanistes cylindricus, one Near Threatened species, Circus macrourus, 31 species from the guinean-congolian forest biome, four species from the sudano-guinean savannah biome, one restricted species and two West African endemics. These birds are of different biogeographical origins and are mainly resident. The majority (48,17 %) of these species have a preference for open environments. This confirms the state of degradation of this forest due to strong anthropic pressures.

KEYWORDS: Avifauna, Tos classified forest, degraded environment, Cote d'Ivoire.

INTRODUCTION

Birds, one of the components of biodiversity, use a wide variety of natural habitats. They are directly affected by disturbances to ecosystems. As a result, they act as bio-indicators of the state of conservation and functioning of ecosystems, landscape modification and climate change.[1,2,3,4] Their mobility enables them to react instantly to any changes in the environment. Monitoring forest specialist species within this group means measuring the intensity of the impact of the change it is facing. Birds make an active contribution to the functioning of ecosystems through pollination, seed dissemination, cleaning up the environment, etc.[5] Also, the diurnal lifestyle and visual and auditory manifestations of most species make them easily accessible to the observer. As homeothermic vertebrates, birds are among the best-known classes in the phylum. What's more, their taxonomy and worldwide geographical distribution are relatively well documented compared with other taxa[6], which makes it easier to identify them and quickly analyse the results of an ornithological study. Moreover, birds are also among the most charismatic species[7], which can help in the presentation of recommendations to decision-makers and all those concerned with their conservation, with a view to improving natural resource management policies. Despite their diverse importance, birds are confronted with the often drastic degradation of their natural habitats, linked mainly to agricultural activities, especially in developing countries.[8,9,10,11,12] In Cote d'Ivoire, especially in severely degraded environments, few studies have been carried out on birds. This state of affairs was observed in the Tos classified forest (FCT), the subject of this study. To make up for this lack of information, the aim of this study is to gain an understanding of the avifaunal population of this highly disturbed forest relic, with a view to contributing to its sustainable management.

Study site

FCT, with a surface area of 138 ha, is located on the Bonon - Bouaflé axis between latitudes 6°55‘ and 6°45’ North and between longitudes 5°56‘ and 5°55’ West. This forest belongs to the town of Bouaflé, which is located in central-western Cote d'Ivoire in the Marahoué region, between 6°55‘ and 7°01’ north latitude and 5°44‘ and 5°49’ west longitude (Figure 1). Bouaflé’s department straddles the forest zone to the south and west and the savannah zone to the north-east. It is located on the Yamoussoukro-Daloa road, 60 km from Yamoussoukro, the political capital, and 317km from Abidjan, the economic capital of Cote d'Ivoire.[13] Bouaflé is the capital of the Marahoué region. Administratively, the region is bordered to the north by

the Béré region, to the south by the Gôh region, to the east by the Gbêkê and Bélier regions, and to the west by the Haut-Sassandra region (Figure 1). The vegetation of the Bouaflé department includes semi-deciduous dense rainforest and mosaics of forest and savannah, characteristic of the 'V baoulé'.[14,15]

Wooded savannah predominates in open landscapes.[8] The relief of the region is relatively flat, consisting of low plateaux with a few shallows and hills with an average altitude of 260 m. The climate is Baoulean and characterised by two seasons. The dry season runs from november to march and the rainy season begins in april and ends in october.[16]

The region is drained by the Bandama rouge river (the Marahoué), which acts as a natural border on the eastern side, then the white Bandama, which crosses most of the study area, and the Baha, Ouréné, Bôlè, Zabré, Bouré, Dromonyi, Houda and Tenére rivers. The topography of the study area is relatively flat. It is made up of low plateaux with a few shallows and hills with an average altitude of 260 m.

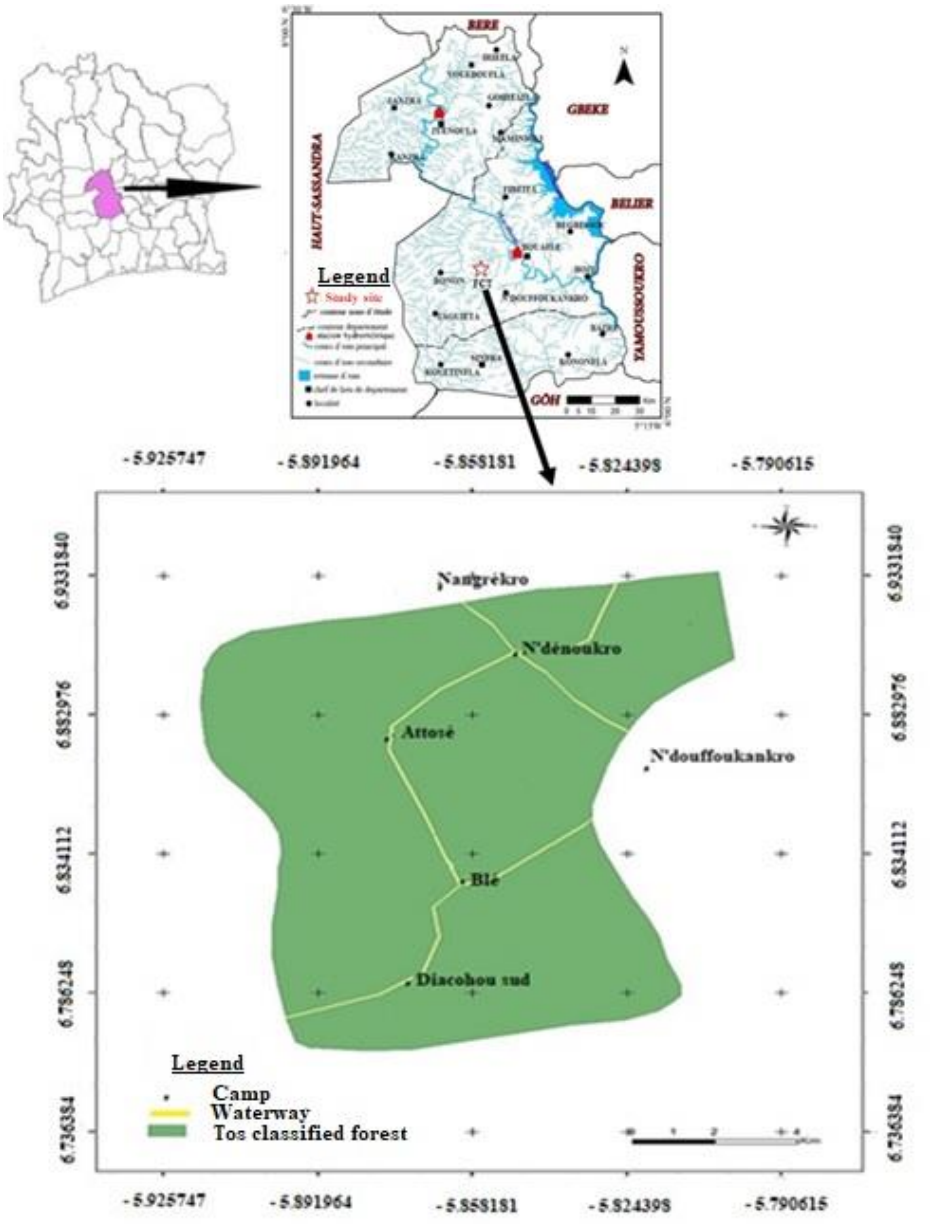

Figure 1: Location of the Tos Classified Forest (FCT) in the Bouaflé department.

MATERIALS AND METHODS

The equipment used consisted of a pair of binoculars (Bushnell, 10 x 50 mm) for direct observation of the birds; a large torch (Garrity ®) to illuminate the tracks and paths during the night-time surveys; a digital camera (Olympus 5 x wide optical zoom 4.7-23.5 mm 1: 2.8-6. 5) for taking photographs; a dictaphone (SONY ®; Cassette-Corder; TCM-150) for recording vocalisations; a bird identification guide[17] for identifying birds; a GPS (Global Positioning System) device (Garmin 60 CSx) to

record geographical coordinates, plot routes and mark the various observation points; two mist nets (10 m long, 3.5 m high, 25 mm mesh) to capture and recapture the birds. The FCT was subdivided into three study sectors in addition to the peripheral sector represented by an agrosystem. This subdivision was made on the basis of the presence or absence of wetlands, the heterogeneity of the vegetation and the degree of anthropisation (the intensity or extent of human activities) of the environment. Four sample sites, each comprising a 2 km linear transect, were identified. The study took place from january to may 2018. The methods used were, respectively, listening points[18,19,20,12], capture and recapture with mist nets[21] and fixed-term census along linear transects[22,23,24] with five-minute stopping points at the listening stations[12] The method of fixed listening and observation points was carried out throughout the day between 06:30 and 18:30 on each sample site in a location offering a good view of the entire site.

The capture and recapture with mist nets (outside the transect) was carried out at the same times as the fixed listening and observation points, but in a closed environment (6°49'58.80 'N / 5°51'39.6 'W). The nets were visited every 20 mm to identify the individuals captured, mark them and then release them. Daytime observations on linear transects took place in the morning from 06:30 to 10:30 and in the afternoon from 15:30 to 18:30. The inventories were based on a systematic count of all the bird species identified, sighted or heard along the four 2 km transects during a slow (0.5 to 1 km/h) and silent walk. For the nocturnal observations, the inventories were carried out on the transects used for sampling the diurnal species. The main method used was the technique of replaying vocalisations. The songs of all the species were recorded. The conservation status[25], preferred habitats (FF: highly forest-dependent; F: forest generalist; f: open environment; E: wetland)[26,22] and biogeographical origins (resident, Afrotropical migrant or Palaearctic migrant) were indicated for each of the species surveyed, according to[17] Restricted-range (RR) species, i.e. land bird species with a breeding range of less than 50,000 km² that make up the Upper Guinean Forest Bird Endemism Area and species endemic to West Africa (WA), were identified. Information on the biomes (sudano-guinean savannah and guineo-congolian forest) can be found in[27] and.[28]

RESULTS

Bird diversity

This study enabled 137 bird species to be inventoried, divided into 44 families of 15 orders (Table 1). Passeriformes represented 54.01% of the population, with 74 species from 21 families. Among the best represented families in terms of species richness, the Accipitridae family, with 14 species, is the most diverse at this site. Next come the Cisticolidae and Ploceidae families, with 10 species each. Next come the families Lybiidae and Nectariniidae, with nine species each. Finally, there are the families Ardeidae, Columbidae and Cuculidae, with six species each.

Species of conservation interest

Three species recorded in the FCT are of global conservation interest. They are on the International Union for Conservation of Nature (IUCN) Red List : one Endangered (EN) Psittacus timneh, one Vulnerable (VU) Bycanistes cylindricus and one Near Threatened (NT) Circus macrourus.

Thirty-one (31) bird species confined to the guineo-congolian Forest (GC) biome and three others confined to the sudano-guinean Savannah (SG) biome are present in the FCT. There is also a restricted-range species (RR) and two endemic West African species (AO).

Table 1: List of bird species recorded in the Tos classified forest.

SCIENTIFIC NAME	COMMON NAME	SC	HP	SB	BIO GC/SG	RR	END AO
GALLIFORMES							
NUMIDIDAE							
Numida meleagris (Linnaeus, 1758)	Helmeted Guineafowl	LC	f	R			
PHASIANIDAE							
Pternistis ahantensis (Temminck, 1854)	Ahanta Spurfowl	LC	F	R	GC		
Pternistis bicalcaratus (Linnaeus, 1766)	Double-spurred Spurfowl	LC	f	R			
COLUMBIFORMES							
COLUMBIDAE							
Treron calvus (Temminck, 1811)	African Green-pigeon	LC	F	R			
Turtur brehmeri (Hartlaub, 1865)	Blue-headed Wood-dove	LC	F	R	GC		
Turtur tympanistria (Temminck, 1809)	Tambourine Dove	LC	F	R			
Turtur afer (Linnaeus, 1766)	Blue-spotted Wood-dove	LC	f	R			
Streptopelia semitorquata (Rüppell, 1837)	Red-eyed Dove	LC	f	R			
Spilopelia senegalensis (Linné, 1766)	Laughing Dove	LC	f	R			
CAPRIMULGIFORMES							
CAPRIMULGIDAE							
Caprimulgus europaeus (Linnaeus, 1758)*	European Nightjar	LC	f	P			

Caprimulgus longipennis (Shaw, 1796)*	Standard-winged Nightjar	LC	f	M			
CUCULIFORMES							
CUCULIDAE							
Chrysococcyx cupreus (Shaw, 1792)	African Emerald Cuckoo	LC	F	R			
Chrysococcyx klaas (Stephens, 1815)	Klaas's Cuckoo	LC	f	R/M			
Chrysococcyx caprius (Boddaert, 1783)	Diederik Cuckoo	LC	f	R/M			
Ceuthmochares aereus (Vieillot, 1817)	Chattering Yellowbill	LC	f	R			
Centropus grillii (Hartlaub, 1861)	Black Coucal	LC	f	M/R			
Centropus senegalensis (Linnaeus, 1766)	Senegal Coucal	LC	f	R			
MUSOPHAGIFORMES							
MUSOPHAGIDAE							
Corythaeola cristata (Vieillot, 1816)	Great Blue Turaco	LC	FF	R			
Tauraco persa (Linnaeus, 1758)	Green Turaco	LC	FF	R	GC		
Tauraco macrorhynchus (Fraser, 1839)	Yellow-billed Turaco	LC	FF	R	GC		
Crinifer piscator (Boddaert, 1783)	Western Plantain-eater	LC	f	R			
PELECANIFORMES							
ARDEIDAE							
Nycticorax nycticorax (Linnaeus, 1758)	Black-crowned Night Heron	LC	E	R			
Bubulcus ibis (Linnaeus, 1758)	Cattle Egret	LC	E	R/M			
Butorides striata (Linnaeus, 1758)	Green-backed Heron	LC	E	R			
Ardea intermedia (Wagler, 1829)	Intermediate Egret	LC	E	R			
Ardea alba (Linnaeus, 1758)	Great White Egret	LC	E	R			
Ardea cinerea (Linnaeus, 1758)	Grey Heron	LC	E	R/P			
SCOPIDAE							
Scopus umbretta (Gmelin, 1789)	Hamerkop	LC	E	R			
CHARADRIIFORMES							
CHARADRIIDAE							
Vanellus senegallus (Linnaeus, 1766)	Wattled Lapwing	LC	E	R			
JACANIDAE							
Actophilornis africanus (Gmelin, 1789)	African Jacana	LC	E	R			
Microparra capensis (Smith, 1839)	Lesser Jacana	LC	E	M			
STRIGIFORMES							
TYTONIDAE							
Tyto alba (Scopoli, 1769)*	Common Barn-owl	LC	f	R			
STRIGIDAE							
Ptilopsis leucotis (Temminck, 1820)*	Northern White-faced Owl	LC	f	R			
Jubula lettii (Büttikofer, 1889)*	Maned Owl	DD	FF	R	GC		
Strix woodfordii (Smith, 1834)*	African Wood-owl	LC	F	R			
ACCIPITRIFORMES							
ACCIPITRIDAE							
Pernis apivorus (Linnaeus, 1758)	European Honey-buzzard	LC	f	P			
Macheiramphus alcinus Westermann, 1851	Bat Hawk	LC	F	R			
Elanus caeruleus (Desfontaines, 1789)	Black-winged Kite	LC	f	R			
Milvus aegyptius (Boddaert, 1783)	Yellow-billed Kite	LC	f	M			
Gypohierax angolensis (Gmelin, 1788)	Palm-nut Vulture	LC	F	R			
Polyboroides typus (Smith, 1829)	African Harrier-hawk	LC	F	R			
Circus macrourus (Gmelin, 1770)	Pallid Harrier	NT	f	P			
Circus pygargus (Linnaeus, 1758)	Montagu's Harrier	LC	f	P			
Micronisus gabar (Daudin, 1800)	Gabar Goshawk	LC	f	R			
Aerospiza toussenelii (Verreaux & Verreaux, 1855)	Red-chested Goshawk	LC	FF	R			
Accipiter badius (Gmelin, 1788)	shikra	LC	f	R			
Kaupifalco monogrammicus (Temminck, 1824)	Lizard Buzzard	LC	f	R			
Aquila rapax (Temminck, 1828)	Tawny Eagle	VU	f	R			
Hieraaetus ayresii (Gurney, 1862)	Ayres's Hawk-eagle	LC	FF	R			
BUCEROTIFORMES							
BUCEROTIDAE							
Horizocerus albocristatus (Cassin, 1848)	White-crested Hornbill	LC	FF	R	GC		
Lophoceros semifasciatus (Hartlaub, 1855)	West African Pied Hornbill	LC	F	R	GC		

Lophoceros nasutus (Linnaeus, 1766)	African Grey Hornbill	LC	f	R			
Bycanistes fistulator (Cassin, 1852)	Western Piping Hornbill	LC	f	R	GC		
Bycanistes cylindricus (Temminck, 1824)	Brown-cheeked Hornbill	VU	FF	R	GC	RR	
CORACIIFORMES							
MEROPIDAE							
Merops albicollis (Vieillot, 1817)	White-throated Bee-eater	LC	f	M			
Merops apiaster (Linnaeus, 1758)	European Bee-eater	LC	f	P			
CORACIIDAE							
Coracias cyanogaster (Cuvier, 1817)	Blue-bellied Roller	LC	f	R	SG		
Eurystomus gularis (Vieillot, 1819)	Blue-throated Roller	LC	F	R	GC		
ALCEDINIDAE							
Halcyon malimbica (Shaw, 1811)	Blue-breasted Kingfisher	LC	F	R			
Halcyon senegalensis (Linnaeus, 1766)	Woodland Kingfisher	LC	f	R			
Corythornis cristatus (Pallas, 1764)	Malachite Kingfisher	LC	E	R			
PICIFORMES							
LYBIIDAE							
Gymnobucco peli (Hartlaub, 1857)	Bristle-nosed Barbet	LC	F	R	GC		
Gymnobucco calvus (Lafresnaye, 1841)	Naked-faced Barbet	LC	F	R	GC		
Pogoniulus atroflavus (Sparrman, 1798)	Red-rumped Tinkerbird	LC	FF	R	GC		
Pogoniulus subsulphureus (Fraser, 1843)	Yellow-throated Tinkerbird	LC	FF	R	GC		
Pogoniulus bilineatus (Sundevall, 1850)	Yellow-rumped Tinkerbird	LC	F	R			
Tricholaema hirsuta (Swainson, 1821)	Hairy-breasted Barbet	LC	F	R	GC		
Lybius vieilloti (Leach, 1815)	Vieillot's Barbet	LC	f	R			
Pogonornis bidentatus (Shaw, 1798)	Double-toothed Barbet	LC	f	R			
Pogonornis dubius (Gmelin, 1788)	Bearded Barbet	LC	f	R	SG		AO
PICIDAE							
Dendropicos pyrrhogaster (Malherbe, 1845)	Fire-bellied Woodpecker	LC	F	R	GC		
FALCONIFORMES							
FALCONIDAE							
Falco ardosiaceus (Vieillot, 1823)	Grey Kestrel	LC	f	R			
Falco cuvierii (Smith, 1830)	African Hobby	LC	f	R			
PSITTACIFORMES							
PSITTACIDAE							
Psittacus timneh (Fraser, 1844)	Timneh Parrot	EN	FF	R			
PASSERIFORMES							
PITTIDAE							
Pitta angolensis (Vieillot, 1816)	African Pitta	LC	F	M			
ORIOLIDAE							
Oriolus nigripennis (Verreaux & Verreaux, 1855)	Black-winged Oriole	LC	FF	R	GC		
Oriolus brachyrynchus (Swainson, 1837)	Western Oriole	LC	F	R	GC		
CAMPEPHAGIDAE							
Campephaga quiscalina (Finsch, 1869)	Purple-throated Cuckooshrike	LC	F	R			
VANGIDAE							
Bias musicus (Vieillot, 1818)	Black-and-white Shrike-flycatcher	LC	f	R			
PLATYSTEIRIDAE							
Platysteira cyanea (Müller, 1776)	Brown-throated Wattle-eye	LC	f	R			
MALACONOTIDAE							
Tchagra senegalus (Linnaeus, 1766)	Black-crowned Tchagra	LC	f	R			
Dryoscopus gambensis (Lichtenstein, 1823)	Northern Puffback	LC	F	R			
Laniarius leucorhynchus (Hartlaub, 1848)	Lowland Sooty Boubou	LC	f	R	GC		
DICRURIDAE							
Dicrurus atripennis (Swainson, 1837)	Shining Drongo	LC	FF	R	GC		
Dicrurus modestus (Hartlaub, 1849)	Velvet-mantled Drongo	LC	F	R			
MONARCHIDAE							
Terpsiphone rufiventer (Swainson, 1837)	Red-bellied Paradise-flycatcher	LC	F	R	GC		
LANIIDAE							
Lanius collaris (Linnaeus, 1766)	Common Fiscal	LC	f	R			
CORVIDAE							

Corvus albus (Müller, 1776)	Pied Crow	LC	f	R			
MACROSPHENIDAE							
Sylvietta virens (Cassin, 1859)	Green Crombec	LC	F	R	GC		
CISTICOLIDAE							
Camaroptera brachyura (Vieillot, 1820)	Bleating Camaroptera	LC	f	R			
Camaroptera chloronota Reichenow, 1895	Olive-green Camaroptera	LC	FF	R	GC		
Cisticola erythrops (Hartlaub, 1857)	Red-faced Cisticola	LC	f	R			
Cisticola lateralis (Fraser, 1843)	Whistling Cisticola	LC	f	R			
Prinia subflava (Gmelin, 1789)	Whistling Cisticola	LC	f	R			
Prinia erythroptera (Jardine, 1849)	Red-winged Prinia	LC	f	R			
HIRUNDINIDAE							
Delichon urbicum (Linnaeus, 1758)	Northern House Martin	LC	f	P			
Cecropis semirufa (Sundevall, 1850)	Red-breasted Swallow	LC	f	R			
Cecropis abyssinica (Guérin-Méneville, 1843)	Lesser Striped-Swallow	LC	f	R			
Hirundo rustica (Linnaeus, 1758)	European Swallow	LC	f	P			
PYCNONOTIDAE							
Stelgidillas gracilirostris (Strickland, 1844)	Slender-billed Greenbul	LC	FF	R			
Chlorocichla simplex (Hartlaub, 1855)	Simple Greenbul	LC	F	R	GC		
Eurillas latirostris (Strickland, 1844)	Yellow-whiskered Greenbul	LC	F	R			
Eurillas virens (Cassin, 1858)	Little Greenbul	LC	F	R			
Eurillas curvirostris (Cassin, 1860)	Plain Greenbul	LC	FF	R	GC		
Pycnonotus barbatus (Desfontaine, 1789)	Common Bulbul	LC	f	R			
SCOTOCERCIDAE							
Hylia prasina (Cassin, 1855)	Green Hylia	LC	f	R	GC		
ZOSTEROPIDAE							
Zosterops senegalensis Bonaparte, 1850	African Yellow White-eye	LC	f	R			
STURNIDAE							
Lamprotornis splendidus (Vieillot, 1822)	Splendid Starling	LC	F	R			
MUSCICAPIDAE							
Muscicapa striata (Pallas, 1764)	Spotted Flycatcher	LC	f	R			
Muscicapa cassini Heine, 1859	Cassin's Flycatcher	LC	F	R	GC		
Ficedula hypoleuca (Pallas, 1764)	European Pied Flycatcher	LC	f	P			
Saxicola rubetra (Linnaeus, 1758)	Whinchat	LC	f	P			
NECTARINIIDAE							
Anthreptes longuemarei (Lesson, 1831)	Western Violet-backed Sunbird	LC	F	R			
Hedydipna collaris (Vieillot, 1819)	Collared Sunbird	LC	f	R			
Cyanomitra verticalis (Latham, 1790)	Green-headed Sunbird	LC	F	R			
Cyanomitra olivacea (Smith, 1840)	Olive Sunbird	LC	FF	R			
Chalcomitra adelberti (Gervais, 1833)	Buff-throated Sunbird	LC	F	R	GC		AO
Chalcomitra senegalensis (Linnaeus, 1766)	Scarlet-chested Sunbird	LC	FF	R			
Cinnyris chloropygius (Jardine, 1842)	Olive-bellied Sunbird	LC	f	R			
Cinnyris coccinigastrus (Latham, 1801)	Splendid Sunbird	LC	f	R	SG		
Cinnyris cupreus (Shaw, 1811)	Copper Sunbird	LC	f	R			
PLOCEIDAE							
Quelea erythrops (Hartlaub, 1848)	Red-headed Quelea	LC	f	R/M			
Quelea quelea (Linnaeus, 1758)	Red-billed Quelea	LC	f	O			
Euplectes hordeaceus (Linnaeus, 1758)	Black-winged Bishop	LC	f	R			
Euplectes macroura (Gmelin, 1789)	Yellow-mantled Widowbird	LC	f	R			
Ploceus heuglini Reichenow, 1886	Heuglin's Masked Weaver	LC	f	R	SG		
Ploceus cucullatus (Müller, 1776)	Village Weaver	LC	f	R			
Ploceus tricolor (Hartlaub, 1854)	Yellow-mantled Weaver	LC	FF	R	GC		
Ploceus superciliosus (Shelley, 1873)	Compact Weaver	LC	f	R			
Ploceus nigerrimus Vieillot, 1819	Vieillot's Black Weaver	LC	f	R	GC		
Malimbus rubricollis (Swainson, 1838)	Red-headed Malimbe	LC	f	R	GC		
ESTRILDIDAE							
Estrilda melpoda (Vieillot, 1817)	Orange-cheeked Waxbill	LC	f	R			
Spermestes cucullata Swainson, 1837	Bronze Mannikin	LC	f	R			
Spermestes bicolor (Fraser, 1843)	Black-and-white Mannikin	LC	f	R			

VIDUIDAE							
Vidua macroura (Pallas, 1764)	Pin-tailed Whydah	LC	f	R			
Anomalospiza imberbis (Cabanis, 1868)	Cuckoo-finch	LC	f	R			
PASSERIDAE							
Passer griseus (Vieillot, 1817)	Northern Grey-headed Sparrow	LC	f	R			

HP: Preferred habitat; F: Forest generalist; FF: Forest specialist; f: Open environment; E: Wetland; SC: Conservation status; LC: Least concern; DD: Data deficient; NT: Near threatened; EN: Endangered; VU: Vulnerable; SB: Biogeographical status; M: Intra-African migrant; P: Palearctic migrant; R: Resident; O: Occasional; Bio: Biome; SG: species belonging to the sudano-guinean savannah biome; GC: species belonging to the guineo-congolese forest biome; RR: restricted distribution species; End: Endemic to West Africa; *: nocturnal species.

Stand characterisation

The data on the species' preferred habitats show that 30 species (21.90%) are forest specialists (FF), 30 species (21.90%) are generalists of forests (F), 66 species (48.17%) of open environments (f) and 11 species (8.03%) associated with wetlands (E). In terms of biogeographical origins, the population is largely dominated by residents (R), with 121 species (88.32%) strictly resident. Ten species (7.30%) are strictly migratory, including five (3.65%) intra-African migratory species (M) and five (3.65%) Palaearctic migratory species (P). Mixed-status species (R/M ; M/R and R/P) represent 4.38% of the bird species population. Figure 2 shows images of some of the bird species found in the FCT.

Figure 2: Photograph of some of the bird species inventoried in the Tos classified forest.

DISCUSSION

The FCT's qualitative bird inventories have identified 137 species of bird, divided into 44 families and 15 orders. The species richness of the birds is relatively high given the scale of the threats (habitat loss, poaching, capture for trade and consumption, pollution of watercourses by agricultural inputs, grazing, etc.) facing the birds in this 138 ha forest relic. It is higher than in the classified forests of Téné (FCTé; 29700 ha) and N'Ganda N'Ganda (FCN; 4813 ha), which record 103[29] and 132[30] bird species respectively. These differences could be explained, on the one hand, by the combination of sampling techniques (fixed observation points, listening to songs and calls, capture and recapture with mist nets) and, on the other hand, by the inclusion of nocturnal birds in the inventory of the present study. However, it should be noted that for the same methods used in the Besso classified forest (FCB; 21565 ha), the work of[31] enabled many more bird species to be counted (170 species) than those obtained in our study. This difference

could be linked to the abundance of food resources, the heterogeneity of habitats in this forest massif (FCB) undergoing full rehabilitation, and above all, the sampling efforts deployed in these different studies. However, following the example of the studies carried out in the FCB[31] and FCTé[29], the results showed that the order Passeriformes was the best represented. This dominance of the Passeriformes would no doubt reflect their importance at global level in terms of species richness. They are represented by 5,700 species and 96 families, i.e. 60% of avian species.[32,33]

Our work shows that the Accipitridae family, with 14 species, is the most diverse. Our results corroborate those of[34] in the Tanoé-Ehy marsh forest, where the Accipitridae family, with 20 species, was the best represented in the avifaunal population. However, they differ from those of[31] and[29] where the most represented families were the Pycnonotidae (17 species) and the Nectariniidae (11 species) respectively.

In addition, the relatively low number of 31 species confined to the guineo-congolese forest biome compared with the 185 species reported from Cote d'Ivoire[28] and the higher percentage (48.17%) of species from open environments compared with forest species (21.90%) obtained in our study, could reflect the advanced state of degradation of this FCT forest due essentially to anthropogenic activities. The same observations were made by[29] and[35] respectively in the Téné classified forest, where the environment was disturbed by cocoa farming, and in the Haut Bandama Flora and Fauna Reserve, where farming, grazing and poaching activities were intensified. Nevertheless, the observation of three bird species (Psittacus timneh (EN); Bycanistes cylindricus (VU); Circus macrourus (NT)) whose protection is of worldwide interest; 35 bird species with particular biomes, including 31 from the Guinean-Congolese forest (GC) and four from the sudano-guinean savannahs (SG); one species with a restricted distribution and two species endemic to West Africa (WA) in FCT indicates that this forest relic deserves special attention. It is therefore vital to take immediate decisions to curb the threats and restore the natural habitats in order to conserve the bird species that depend on it.

CONCLUSION

The study of the avifauna of the FCT identified 137 species divided into 44 families of 15 orders. These data are fairly representative of the avifauna of the classified forests of Cote d'Ivoire. It highlights the advanced state of degradation of this forest, with a high proportion (48.17%) of species from open environments. Despite heavy human pressure, the FCT contains species of global conservation interest listed on the IUCN Red List, such as Psittacus timneh (EN) and Bycanistes cylindricus (VU). Hence the need for the Direction de la Faune et des Ressources Cynégétiques (DFRC) to commission additional studies, in particular to preserve Psittacus timneh populations that are highly threatened by human activities and intensively captured for sale. In addition, appropriate conservation efforts should be made by the managers of this classified forest to restore the natural habitats and their wildlife resources, particularly birds, with a view to sustainable and efficient management for present and future generations.

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