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Avifaunal and environmental changes on the campus of the University of Ghana, Legon, between the 1960s and 2004

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Summary

Of 111 bird species recorded regularly and annually from late January to late April on the University of Ghana campus at Legon, in the 1960s and 1970s, only 83 were recorded in the same period in 2004. Of these, seven were considered more common and 13 less common than from 1960 to 1975. The environmental changes that have occurred during the intervening years are considered the main reason for the loss of most of the 28 species (24 Afrotropical and 4 Palaearctic). Five species not present from 1960 to 1975 were regularly recorded in 2004.

Résumé

Changements dans l'avifaune et l'environnement sur le campus de l'Université de Ghana, Legon, entre les années 1960 et 2004. Sur les 111 espèces d'oiseaux observées régulièrement chaque année de fin janvier à fin avril sur le campus de l'Université du Ghana à Legon pendant les décades de 1960 et 1970, seulement 83 furent observées pour la même période en 2004. Sur celles-ci, sept étaient considérées plus communes et 13 moins communes qu'entre 1960 et 1975. Les changements survenus entre temps dans le milieu sont considérés comme la raison principale de la perte de la plupart des 28 espèces (24 afrotropicales et 4 paléarctiques). Cinq espèces absentes entre 1960 et 1975 ont été régulièrement observées en 2004.

Introduction and methods

I was resident at Legon from 1960 to 1975 and gathered data on the birds found on and in the immediate vicinity of the University of Ghana campus. In 2004 I had the opportunity to return for the period late January to late April, and made daily observations as time allowed.

It is well documented that an increase in pollution and environmental changes and infrastructure development in a locality have direct and indirect impacts on its

avifauna (BirdLife International 2004). Many environmental changes have occurred on the University campus and its environs since the 1970s, particularly in the last decade. As rare or infrequently recorded birds would not be adequate indicators of the effect of environmental changes on a local avifauna subject to relatively limited recent observation, I limited this study to species that were invariably encountered or often found, singly or in numbers, in their preferred habitats at Legon from late January through to end of April in the 1960s and 1970s (taken from Grimes 1987), and that were recorded annually or which bred.

Nomenclature and sequence follow Brown *et al.* (1982), Urban *et al.* (1986, 1997), Fry *et al*. (1988, 2000), Keith *et al.* (1992) and Fry & Keith (2004).

Changes in the environment

In the 1960s, the campus was part of the transition zone between the grass savanna and the thicket zone of the Accra Plains and was surrounded by a mixture of grassland, thicket and scattered trees which characterised the western sector of the plains (Brammer 1967). Some indigenous trees grew on the campus but it was landscaped by mainly exotic species. The suburbs of Accra were beginning to spread northwards and by the mid 1970s had reached the International Airport some 5 km south of Legon. Just 1 km or so north from Legon along the Dodowa road was the village of Madina, and on the plains northeast of Legon the only major construction was the Atomic Reactor and associated staff housing at Kwabenya. Today, in marked contrast, the campus is effectively an island in a sea of urbanisation in which Madina and Kwabenya have been swallowed.

The number of staff bungalows in Little Legon, Legon Hill, Lower Hill, East Legon and Ayido Valley (Fig. 1) had not changed but, since 1993, further residential areas have been built south of Little Legon on land formerly the research site of the Physics Department. An international student hostel has been erected between East Legon and South Legon and other student accommodation has replaced the cricket pitch south of Mensah Sarbah Hall. In the late 1970s several student annexes were built south of Akuafo Hall, Legon Hall and Mensah Sarbah Hall (Fig. 1) and the areas in between converted to playing fields, which through over use were in 2004 bare of grass. In addition, some science faculties erected extra buildings, mainly on the north side of University Avenue (Fig. 1) and several new buildings were under construction in 2004. Extensions to the Balme Library were started in early February and plans for a new physics laboratory were well advanced by the time I left.

Notwithstanding these developments, the campus was an oasis of relatively lush vegetation. All roads were still lined with trees planted in the 1950s, e.g. Copper Pod *Peltophorum pterocarpum* along the Estate and Akuafo Roads, *Millingtonia hortensis* along the roads leading into Lower Hill, Mahogany *Khaya senegalensis* along the University Avenue and *Tabebuia mimosa* trees, infected with mistletoe, along roads

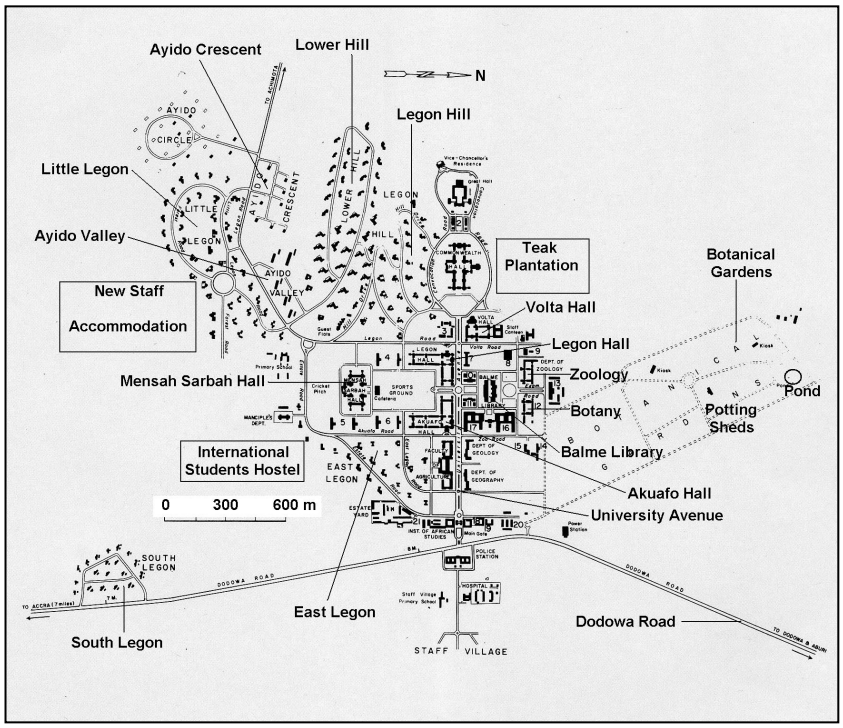

Figure 1. The campus of the University of Ghana in 1993 and the approximate locations of the new staff and students accommodation built since 1993, and the newly planted Teak plantation.

bordering the Botany and Zoology Departments. The majority were more than twice their 1970s height and their canopies were often continuous. Specimens of Rain Tree *Samanea saman* were still flourishing in older residential areas and several Silk Cotton *Ceiba pentandra* trees on Legon Hill were now large enough to house a vulture's nest each. Open parkland, of grass with scattered trees and shrubs, existed between most of the houses, though some areas, *e.g.* between Ayido Crescent and Ayido Valley and southwest of Little Legon, were overgrown with thicket of mainly Neem *Azadirachta indica* saplings. Houses with gardens had mixed borders of shrubs and trees and those on the periphery of the campus had small plantations of cassava, and clumps of banana and paw-paw trees, much as they did in the 1970s. In the 1970s, Legon Hill had staff residences on the south side and the west and north sides were covered with lush grass, thicket patches and shrub vegetation. By 2004 this vegetation

was degraded through cut and burn farming and that on the north side had been cleared and replaced by a young teak plantation.

Although the infrastructure of the Botanical Garden (Fig.1) had been neglected, the variety of trees and their density were little changed. The Mother of Cocoa *Gliricidia sepium* plantation still existed south of the pond (Fig. 1) but the large Silk Cotton tree that grew near it, and housed a vulture's nest in the 1970s, had fallen. The canopy of the semi-deciduous forest trees planted in the 1950s near the potting sheds was now continuous and the light intensity at ground level was low.

The most important factor that has affected the environment has been the increase in student numbers, particularly in the last decade. Numbers were 2360 in 1971–2, reached 16000 in 2001–2 and then shot up to just over 24800 in 2003–4. Public transport and service vehicles have increased in step with student numbers, and a continuous flow of traffic occurred throughout the day along most roads linking the faculties and student residences (Fig. 1). Short-cut tracks, between lecture rooms and accommodation blocks, criss-crossed the campus everywhere, and grass cover in the central campus was minimal, particularly between Volta Hall, the Balme Library and the Science block. Noise pollution and litter of plastic bags and bottles did not exist in the 1970s but both were now major concerns. In addition, many food stalls contributed to the general pollution.

Results

The 111 indicator species selected, which were recorded in the period late January to late April in the 1960s and 1970s, are listed in Table 1, together with their assessed status for the same months in 2004. Of the 83 present in 2004, seven were more common and 13 less common.

Table 1. Bird species regularly and commonly recorded at Legon from late January to late April in the 1960s and 1970s, and their status in 2004. Status symbols: + more common; = no change; – less common; 0 not recorded.

	Status in 2004
Ardeidae	
Nycticorax nycticorax Black-crowned Night Heron	0
Bubulcus ibis Cattle Egret	+
Accipitridae	
Elanus caeruleus Black-shouldered Kite	–
Milvus migrans Black Kite	+
Necrosyrtes monachus Hooded Vulture	+
Accipiter badius Shikra	=
Kaupifalco monogrammicus Lizard Buzzard	=

	Status in 2004
Falconidae	
Falco tinnunculus Common Kestrel	0
F. ardosiaceus Grey Kestrel	–
F. subbuteo African Hobby	=
Phasianidae	
Francolinus bicalcaratus Double-spurred Francolin	–
Rallidae	
Amaurornis flavirostris Black Crake	=
Jacanidae	
Actophilornis africana African Jacana	=
Charadriidae	
Vanellus senegallus Wattled Plover	=
V. lugubris Senegal Plover	–
Columbidae	
Treron calva African Green Pigeon	0
Turtur afer Red-billed Wood Dove	=
T. abyssinicus Black-billed Wood Dove	=
Streptopelia semitorquata Red-eyed Dove	=
S. vinacea Vinaceous Dove	0
S. senegalensis Laughing Dove	=
Psittacidae	
Poicephalus senegalus Senegal Parrot	+
Musophagidae	
Tauraco persa Green Turaco	–
Musophaga violacea Violet Plantain-eater	=
Crinifer piscator Grey Plantain-eater	=
Cuculidae	
Oxylophus levaillantii Levaillant's Cuckoo	=
Cuculus gularis African Cuckoo	=
Chrysococcyx klaas Klaas's Cuckoo	=
C. caprius Didric Cuckoo	=
Centropus senegalensis Senegal Coucal	=
Tytonidae	
Tyto alba Barn Owl	=
Strigidae	
Otus scops senegalensis Common Scops Owl	=
O. leucotis White-faced Scops Owl	–
Glaucidium perlatum Pearl-spotted Owlet	=
Caprimulgidae	
Caprimulgus climacurus Long-tailed Nightjar	=
Macrodipteryx longipennis Standard-winged Nightjar	0

	Status in 2004
Apodidae	
Cypsiurus parvus African Palm Swift	=
Apus affinis Little Swift	=
Alcedinidae	
Halcyon senegalensis Woodland Kingfisher	=
H. chelicuti Striped Kingfisher	0
Ceyx picta African Pygmy Kingfisher	=
Meropidae	
Merops pusillus Little Bee-eater	=
M. albicollis White-throated Bee-eater	=
M. apiaster European Bee-eater	0
M. malimbicus Rosy Bee-eater	0
Coraciidae	
Eurystomus glaucurus Broad-billed Roller	=
Phoeniculidae	
Phoeniculus purpureus Red-billed Wood-Hoopoe	=
Bucerotidae	
Tockus fasciatus African Pied Hornbill	=
T. nasutus African Grey Hornbill	=
Capitonidae	
Pogoniulus chrysoconus Yellow-fronted Tinkerbird	=
Lybius vieilloti Vieillot's Barbet	–
L. bidentatus Tooth-billed Barbet	=
Picidae	
Campethera punctuligera Fine-spotted Woodpecker	=
Dendropicos goertae Grey Woodpecker	=
Alaudidae	
Mirafra rufocinnamomea Flappet Lark	0
Hirundinidae	
Hirundo senegalensis Mosque Swallow	–
Motacillidae	
Motacilla flava flava Blue-headed Wagtail	0
M. f. thunbergi Grey-headed Wagtail	0
Anthus leucophrys Plain-backed Pipit	0
A. trivialis Tree Pipit	0
Macronyx croceus Yellow-throated Longclaw	0
Campephagidae	
Campephaga phoenicea Red-shouldered Cuckoo-Shrike	=
Pycnonotidae	
Andropadus virens Little Greenbul	0
Chlorocichla simplex Simple Greenbul	=

	Status in 2004
Pycnonotus barbatus Common Bulbul	=
Turdidae	
Luscinia megarhynchos Nightingale	0
Cossypha niveicapilla Snowy-crowned Robin-Chat	=
Turdus pelios African Thrush	=
Sylviidae	
Melocichla mentalis Moustached Grass-Warbler	0
Hippolais polyglotta Melodious Warbler	=
Cisticola erythrops Red-faced Cisticola	–
C. cantans Singing Cisticola	0
C. natalensis Croaking Cisticola	0
C. brachypterus Siffling Cisticola	0
C. juncidis Fan-tailed Cisticola	0
Prinia subflava Tawny-flanked Prinia	=
Heliolais erythroptera Red-winged Warbler	=
Camaroptera brachyura Bleating Warbler	=
Eremomela pusilla Senegal Eremomela	=
Phylloscopus trochilus Willow Warbler	=
P. sibilatrix Wood Warbler	=
Muscicapidae	
Muscicapa striata Spotted Flycatcher	–
Timaliidae	
Turdoides plebejus Brown Babbler	=
T. reinwardtii Blackcap Babbler	=
Nectariniidae	
Cyanomitra verticalis Green-headed Sunbird	=
Cinnyris chloropygia Olive-bellied Sunbird	0
C. coccinigastra Splendid Sunbird	=
C. cuprea Copper Sunbird	=
Zosteropidae	
Zosterops senegalensis Yellow White-eye	0
Laniidae	
*Corvinella corvina*Yellow-billed Shrike	+
Malaconotidae	
Malaconotus blanchoti Grey-headed Bush-Shrike	=
M. sulfureopectus Orange-breasted Bush-Shrike	=
Tchagra senegala Black-crowned Tchagra	=
Dryoscopus gambensis Northern Puffback	=
Laniarius aethiopicus Tropical Boubou	–
L. barbarus Yellow-crowned Gonelek	–
Nilaus afer Brubru	0

	Status in 2004
Prionopidae	
Prionops plumatus White Helmet-Shrike	0
Dicruridae	
Dicrurus adsimilis Fork-tailed Drongo	=
Corvidae	
Corvus alba Pied Crow	+
Sturnidae	
Lamprotornis purpureus Purple Glossy Starling	=
L. chloropterus Lesser Blue-eared Starling	0
Cinnyricinclus leucogaster Amethyst Starling	=
Passeridae	
Passer griseus Northern Grey-headed Sparrow	+
Ploceidae	
Ploceus nigricollis Black-necked Weaver	=
P. heuglini Heuglin's Masked Weaver	=
P. cucullatus Village Weaver	=
Euplectes macroura Yellow-mantled Widowbird	0
Estrildidae	
Lagonosticta rufopicta Bar-breasted Firefinch	–
Spermestes cucullatus Bronze Mannikin	=
Viduidae	
Vidua macroura Pin-tailed Whydah	0
V. wilsoni Bar-breasted Firefinch Indigobird	0

Birds more common in 2004

In the following, the first sentence gives status in the 1960s and 70s; second sentence 2004.

Cattle Egret. Visited campus each day but did not roost there. A roost of at least 300 in trees overhanging the pond in the Botanical Gardens and many in breeding dress in late April.

Black Kite. Roosted in small numbers in the Botanical Gardens and a pair nested near the University Guest Centre. At least 30 roosted regularly within the gardens and two pairs bred, one on Legon Hill and the other at the site used in the 1970s.

Hooded Vulture. A pair nested annually in a Silk Cotton tree near the pool in the Botanical Gardens. Twelve nests with young were located on the campus, three clustered around Commonwealth Hall, three in trees along the University Avenue, two in Little Legon and the rest on Legon Hill; up to 50 birds rested during mid-day on a watered playing field near Mensah Sarbah Hall and many roosted on the campus.

Senegal Parrot. Infrequent in the mid-1960s but their numbers increased in the 1970s as trees increased in size and their foliage became more profuse. This was even

more apparent in 2004, when noisy flocks were daily present in the Botanical Gardens and in all of the residential areas; pairs were investigating nest holes.

Yellow-billed Shrike. Twenty-three groups (*c*. 276 birds) present in Mar 1973 (Grimes 1980). Thirty-three groups (*c*. 297 shrikes) there in Mar 2004 (Grimes 2006).
Pied Crow. Regular visitor to Legon and nested there but nearest roost was at Achimota, some 8 km to the west. Large roosts present in trees along University Avenue and within Legon and Akuafo halls: in a 10-min. period at dusk on 27 Feb 2004, 66 birds moved into the Legon Hall roost from the west; several pairs beginning to build nests, early April.

Northern Grey-headed Sparrow. Present and some pairs nested. Pairs were breeding in all the halls of residence and in roofs of staff houses.

Birds less common in 2004

As in the previous section, the first sentence gives status in the 1960s and 70s; second sentence 2004.

Black-shouldered Kite. Regularly sighted, usually above Legon Hill and within the Botanical Gardens, including a nest with two eggs, 5 Feb 1974, in a tree which also contained a Yellow-billed Shrike's nest. Only record one bird near southern edge of campus, 3 Mar.

Grey Kestrel. Nested in 1970s and regularly sighted on campus. Single birds only seen, 20 Feb and 13 Mar.

Double-spurred Francolin. Frequent in cassava farms bordering campus and in thickets in Botanical Gardens. Only occasional in farms bordering Little Legon.

Senegal Plover. Frequently visited playing fields at night, usually in noisy groups of 4–6. Only once heard near Legon Hall, 7 Mar.

White-faced Owl. Regularly recorded and bred annually, Oct–Feb. Only one, 7 Apr.

Green Turaco. Usually seen, singly or in pairs, on each visit to the Botanical Gardens. Only once recorded there, 16 Apr.

Vieillot's Barbet. Duetting pairs were a feature of the acoustical landscape and bred in the residential areas. Only heard duetting 18 Apr.

Mosque Swallow. Often recorded hawking over Legon. Few sightings.

Red-faced Cisticola. Duets a feature of the acoustical landscape in areas with rank grass and thickets. Only recorded in Little Legon on four occasions.

Spotted Flycatcher. Regular visitor to well established gardens in Little Legon. Only twice recorded.

Tropical Boubou. Bell-like calls a feature of the thicket areas of the Botanical Gardens and on Legon Hill. Only heard 23 Apr.

Gonolek. Occurred in all thicket patches within the Botanical Gardens and in the residential areas and heard regularly. Only two pairs regularly heard in Little Legon.

Bar-breasted Fire-Finch. Frequent in small groups in mature gardens, often visiting garden pools. Only recorded Little Legon, 8 Mar.

Birds not recorded in 2004

Because the 28 species not recorded were readily identifiable in the field, either through sight or sound or both, I am confident that they would have been detected if they had been present. Of these species, the following illustrate typical data collected in the 1960s and 1970s. Black-crowned Night Heron occurred regularly in the Botanical Gardens and roosted near the pond. African Green Pigeon was resident and found within the residential areas and the Botanical Gardens. Standard-winged Nightjars were regularly spotted at night on roads around Legon Hill. Striped Kingfishers frequented playing fields and were particularly vocal mid-Feb to mid-Mar. The European Bee-eater was infrequently recorded in the early 1960s but flocks of ≥ 20 birds were present in the 1970s, either feeding within cassava plots or hawking over the campus, and flocks (≥ 10 birds) of Rosy Bee-eaters were regularly recorded hawking over the campus in the early morning in the 1970s. In the 1960s, Little Greenbuls, Nightingales and Olive-bellied Sunbirds were regularly heard singing or calling from within an extensive area of thicket in the Botanical Gardens. Initially this was protected because of its unique structure, density and composition but by the mid-1970s much of this had been removed and all three species suffered, the Little Greenbul and Olive-bellied Sunbirds being extirpated before the Nightingale. The Yellow Wagtail was a regular visitor and foraged on landscaped grassed areas of the campus and on playing fields, late Sep to end of Mar or early Apr; my only record in 2004 was at Sakumo lagoon, some 30 km east of Legon, 18 Apr. Both Plain-backed and Tree Pipits occurred on playing fields and open parkland, the latter often with wagtails. Family groups of White Helmet-Shrikes often passed through the residential areas of Little Legon and Legon Hill in the late 1960s and 70s, suggesting that some groups were probably resident elsewhere on the plains. The distinctive songs, song flights or calls of the Vinaceous Dove, Flappet Lark, Yellow-throated Longclaw, Moustached Grass-Warbler, the four cisticolas, Yellow White-eye, Brubru, Yellow-mantled Widowbird and Pin-tailed Whydah were a feature of the acoustical landscape in the 1960s and 70s, and males of the last two species were in breeding dress in late Mar or early Apr. The only male pin-tails located in Mar and Apr 2004 were in the Aburi Botanical gardens, some 30 km north of Legon.

Species not recorded on the campus in the 1960s and 1970s but present in 2004

Of the species not present at Legon in the 1960s and 1970s, two had been recorded elsewhere on the Accra plains in the 1970s: Rose-ringed Parakeet *Psittacula krameri* in the Shai Hills *c.* 50 km east of Legon and Blue-breasted Kingfisher *Halcyon malimbica* at Achimota *c.* 8 km to the west (not at Legon as stated in Grimes 1978). The Red-fronted Parrot *Poicephalus gulielmi*, a rain forest species, sighted in a flock of Senegal Parrots (13 Feb 2004) was probably an escapee as it is often kept as a captive bird in Accra (R.J. Dowsett *in litt*.).

Both the Splendid and Long-tailed Glossy Starlings were established species at Legon in 2004 and one at least was breeding. The Splendid, a mainly lowland forest species, was the most abundant and noisiest glossy starling on the campus, even at 3h00,

and the most pugnacious. It competed for nesting sites with Long-tailed in trees near Commonwealth Hall chapel and with Purple Glossy Starling elsewhere on the campus. One pair was feeding young in a nest hole in a tree near the University Guest Centre in February and early April. Its arrival time in the Accra area is not known, though flocks were twice recorded at Legon in 1988 (Dutson & Branscombe 1990, see also Allan 1996). In the 1970s, Long-tailed inhabited the drier areas north of the forest belt. In 2004, a group of three was always present in trees just south of Commonwealth Chapel and in nearby areas of Legon Hill, one was twice recorded in the Botanical Gardens (2 Feb, 6 Mar), and an adult was seen carrying a leaf on several occasions in Feb. It is not known when Long-tailed Glossy Starling reached the Accra Plains but small numbers were recorded in Accra, though not at Legon, as early as 1988 (Dutson & Branscombe 1990). It may well have arrived on the Plains through the drier Volta Region corridor.

Discussion

The reduction in size of thicket, grass savanna and playing fields, and the general degradation of the vegetation surrounding the Legon campus can adequately account for the absence of most of the 28 species that were not seen in 2004 and the reduction in numbers of 13 others. In addition, the general disturbance and noise due to the 10-fold increase in student numbers would also make the campus unattractive to many species. At the same time, the easy availability of food from the numerous food stalls and undisposed waste on the campus would account for the increase in numbers of the Black Kite, Hooded Vulture, Pied Crow and Grey-headed Sparrow. The likely causes for the change in status of other species are more difficult to identify and would require longer observation. The species list will permit assessment of future changes in the avifauna at Legon due to environmental changes. These will undoubtedly occur as a further increase in student numbers is planned. I was pleasantly surprised to find the campus much as I remembered it and it was a delight to walk in familiar territory and hear familiar and new sounds. It remained a haven of rest for visitors from bustling Accra despite the explosion in student numbers, and may it long continue so.

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