

Supplementary Information

Bird species richness and diversity responses to land use change in the Lake Victoria Basin, Kenya

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Table S1. The GPS locations and descriptions of the plots used in the Angurai and Busia study sites.

Site	Plot Label	UTM Zone	Eastings	Northings	Plot Description
Angurai	CULT	36N	0647709	0080225	Cultivated plot, adjacent to WDBS1. Open area without natural cover, but with Lantana thickets nearby.
	FA	36N	0623538	0050248	
	FLGZ	36N	0647727	0079662	Flat open short grassland, no tree cover, Lantana thickets on periphery. Partly turned over to sweet potato cultivation. Located in area of extensive cultivation.
	MZ	36N	0647189	0079064	
	MZCA	36N	06476331	0079631	A small, flat area with cassava, and recently harvested maize. No natural bush or tree cover. Located in an extensively cultivated area.

	WDBS	36N	0647224	0078962	Small area of natural vegetation, though changed forest growth located amongst rocky boulders difficult to farm. Some of the trees reach five to six metres, although much of the original timber has been removed. Unlike WDGR, legumes well represented with many Albizia. The leguminous trees are traditionally the richest for birds, providing them with much nourishment. Undergrowth dense and rank, retaining humidity and much gentler gradient, with flat areas and a stream. The soil retains moisture in the accumulated humus and clay substrate. More open side of boulder hill, heavily cultivated. Location heavily cultivated, however grassy slopes and dense thickets downhill from plot, and a naturally vegetated hill adjacent. The region with the most natural cover of those visited. The plot is contiguous with a scattering of native trees, and dense scrub patches interspersed with native grassland meadows providing considerable habitat for birds. The under storey is open with a very dense cover of shrubs, many of them armed, thus providing a good shelter for birds.
	WDBS1	36N	0647615	0080215	A tiny plot of natural secondary dry scrub on a steep slope, in heavily cultivated area on boulder strewn hill. Rank growth along bordering stream, but only a ribbon of natural vegetation, with a few trees.
	WDGR	36N	0645755	0078905	Broad-leaved scrub, barely four metres high, no trees except a few along boundaries. No shrubby understorey, just rank grass, overall dry biome. Well drained and situated on a steep slope of constant incline. Vegetation appears limited to a few dominant species, with legumes poorly represented. Obviously secondary growth, or all trees over four metres already

					harvested. Natural vegetation forms very small area in extensive cultivation, with thicker growth along nearby creeks and small valleys.
Busia					
	PLOT 1	36N	0623162	0048268	Contiguous with Plots 2 & 4 and cleared. Plots 1, 2 & 4 were in the same general area, and had recently been ploughed up ready for planting.
	PLOT 2	36N	0623088	0049147	Contiguous with Plots 1 & 4 and cleared
	PLOT 3	36N	0623082	0048669	An area of fallow, and had isolated scrubby bushes, rank hedgerow of the exotic <i>Lantana camara</i> and <i>Tithonia</i> . The plot provided both feeding for grammivores and a few insectivores, plus limited habitat for nesting.
	PLOT 4,	36N	0623082	0048268	Contiguous with Plots 1 & 2 and cleared. Plots 1, 2 & 4 were in the same general area, and had been recently ploughed up for planting.
	PLOT 5	36N	0623607	0047803	Consisted of a small area of low scrub, there are a few neighbouring tall trees on an adjacent school ground, but the scrub itself had a very low biodiversity, being otherwise surrounded by completely cleared land.
	PLOT 6	36N	0622881	0047811	A small area of fallow ground, but unlike Plot 3, had no scrub cover.
	PLOT 7	36N	0622861	0047139	Had a few trees including one <i>Ficus</i> , and open scrubby grassland. The chain of vegetation leading from a pristine area of swampland, meant that many adventists were able to visit this plot, thus giving a false impression of the importance of the site for birds.
	SRQP	36N	0623624	0047782	

Table S2. Species of birds observed in the modified and natural/semi natural habitats in Lambwe Valley, Busia and Angurai study sites in western Kenya during 1998-2004.

Species			Sites					
Common name	Scientific name	Guild	Lambwe Valley Disturbed	Nat ural	Busia		Angur ai	
					Disturbed	Natural	Disturbed	Natural
Abdim's Stork	<i>Ciconia abdimii</i>	insectivore	0	1	0	0	0	0
Abyssinian Scimitarbill	<i>Rhinopomastus minor</i>	insectivore	0	1	0	0	0	0

African black swift	<i>Cypseloides niger</i>	insectivore	0	0	0	1	0	1
African citril	<i>Serinus citrinelloides</i>	granivore	0	0	0	1	0	1
African Grey Hornbill	<i>Tockus nasutus</i> ,	frugivore	0	1	0	0	0	0
African Moustached Warbler	<i>Acrocephalus melanopogon</i>	insectivore	1	0	0	1	0	1
African palm swift	<i>Cypsiurus parvus</i>	insectivore	0	0	0	1	0	0
African Paradise Flycatcher	<i>Bradornis microrhynchus</i>	insectivore	0	1	0	0	0	0
African pied wagtail	<i>Motacilla alba yarrellii</i>	insectivore	0	0	1	1	0	0
Angola Swallow	<i>Hirundo angolensis</i>	insectivore	0	1	0	0	0	0
Baglafecht Weaver	<i>Ploceus baglafecht</i>	insectivore	0	0	1	1	0	1
Bar breasted firefinch	<i>Lagonosticta rufopicta</i>	granivore	0	0	0	1	0	0
Bare faced Go-away-bird	<i>Corythaixoides personatus</i>	frugivore	0	1	0	0	0	0
Barn swallow	<i>Hirundo rustica</i>	insectivore	0	1	0	1	0	0
Beautiful Sunbird	<i>Cinnyris pulchella</i>	nectarivore	1	0	0	0	0	0
Black & white mannikin	<i>Lonchura bicolor</i>	granivore	0	0	0	1	0	1
Black and White Cuckoo	<i>Cuculus clamosus</i>	insectivore/frugivore	0	1	0	0	0	0
Black bellied Bustard	<i>Lissotis melanogaster</i>	omnivores	0	1	0	0	0	0
Black bellied firefinch	<i>Lagonosticta rara</i>	granivore	0	0	0	0	0	1
Black billed barbet	<i>Lybius guifsobalito</i>	insectivore/frugivore	0	0	0	0	0	1
Black chested Snake Eagle	<i>Circaetus pectoralis)</i>	Carnivore	0	1	0	0	0	0
Black Cuckoo Shrike	<i>Coracina novaehollandiae</i>	insectivore	1	0	0	0	0	0
Black faced waxbill	<i>Estrilda atricapilla</i>	granivore	0	0	0	0	0	1
Black headed batis	<i>Batis minor</i>	insectivore	0	0	0	0	0	1
Black headed gonolek	<i>Laniarius erythrogaster</i>	insectivore	1	0	0	1	0	1
Black headed heron	<i>Ardea melanocephala</i>	insectivore/carnivore	0	0	0	0	0	1
Black headed weaver	<i>Ploceus melanocephalus</i>	insectivore/granivore	0	0	0	1	0	1
Black lored Babbler	<i>Turdoides melanops</i>	insectivore	1	1	0	0	0	0
Black necked Weaver	<i>Ploceus nigricollis</i>	insectivore	0	1	0	0	0	0
Black rumped waxbill	<i>Estrilda troglodytes</i>	granivore	0	0	0	0	0	1
Black shouldered kite	<i>Elanus axillaris</i>	Carnivore	0	1	1	1	0	1
Black throated Wattle-eye	<i>Platysteira peltata</i>	insectivore	0	1	0	0	0	0
Blue flycatcher	<i>Eumyias sordida</i> ,	insectivore	0	0	0	0	0	1

Blue headed coucal	<i>Centropus monachus</i>	omnivores	0	0	0	1	0	0
Blue naped Mousebird	<i>Urocolius macrourus</i>	frugivore	0	1	0	0	0	0
Blue spotted wood dove	<i>Turtur afer</i>	granivore	0	0	0	1	0	1
brimstone canary	<i>Serinus sulphuratus</i>	granivore	0	0	0	1	1	0
Broad tailed Warbler	<i>Schoenicola platyura platyurus</i>	insectivore	0	1	0	0	0	0
Bronze mannikin	<i>Lonchura cucullata</i>	granivore	0	0	1	1	1	1
Bronze sunbird	<i>Nectarinia kilimensis</i>	insectivore	0	0	0	0	0	1
Brown babbler	<i>Pellorneum fuscicapillum,</i>	omnivores	0	0	0	1	0	0
Brown backed scrub robin	<i>Cercotrichas hartlaubi</i>	insectivore	0	0	0	0	0	1
Brown crowned tchagra	<i>Tchagra australis</i>	insectivore	0	0	0	1	0	1
Brown parrot	<i>Pionopsitta haematotis</i>	frugivore	0	1	1	0	0	0
Brown throated wattle eye	<i>Platysteira cyanea</i>	insectivore	0	0	0	0	0	1
Cabanis greenbul	<i>Phyllastrephus cabanisi</i>	insectivore	0	0	0	0	0	1
Cattle Egret	<i>Bubulcus ibis,</i>	insectivore	1	0	0	0	0	0
Common bulbul	<i>Pycnonotus barbatus,</i>	frugivore	0	0	1	1	1	1
Common fiscal	<i>Lanius collaris</i>	insectivore	0	0	1	1	0	0
Common waxbill	<i>Estrilda astrild</i>	granivore	0	0	0	1	0	1
Compact weaver	<i>Pachtphantes superciliosus</i>	granivore	0	0	1	1	0	1
Copper sunbird	<i>Cinnyris cupreus</i>	insectivore/nec tarivore	0	0	1	1	0	1
Crested francolin	<i>Francolinus sephaena</i>	omnivore	0	0	1	1	0	1
Croaking cisticola	<i>Cisticola natalensis,</i>	insectivore	0	0	0	0	0	1
Crowned Lapwing	<i>Vanellus coronatus</i>	insectivore	1	0	0	0	0	0
Dark capped yellow warbler	<i>Chloropeta natalensis</i>	insectivore	0	0	0	1	0	1
Diederik cuckoo	<i>Chrysococcyx caprius</i>	insectivore	0	0	0	1	0	1
Eastern grey plantain eater	<i>Crinifer zonurus,</i>	frugivore	0	0	0	1	0	0
Emerald sp. Wood Dove	<i>Chalcophaps indica</i>	granivore	0	1	0	0	0	0
Eurasian Hobby	<i>Falco subbuteo</i>	Carnivore	0	1	0	0	0	0
European Bee-eater	<i>Merops apiaster</i>	insectivore	0	1	0	0	0	0
fawn breasted waxbill	<i>Estrilda paludicola</i>	granivore	0	0	0	1	0	0
Fork tailed Drongo	<i>Dicrurus adsimilis,</i>	insectivore	0	1	0	0	0	0
Gabar Goshawk	<i>Micronisus gabar</i>	Carnivore	0	1	0	0	0	0
Great sparrowhawk	<i>Accipiter melanoleucus</i>	Carnivore	0	0	0	0	0	1
Greater honeyguide	<i>Indicator indicator</i>	insectivore/wa x feeder	0	0	0	0	0	1

Greater swamp warbler	<i>Acrocephalus rufescens</i>	insectivore	0	0	0	1	0	0
Green headed sunbird	<i>Cyanomitra verticalis</i>	insectivore/nec tarivore	0	0	0	0	0	1
Green Wood-Hoopoe	<i>Phoeniculus purpureus</i>	insectivore	0	1	0	0	0	0
Grey backed camaroptera	<i>Camaroptera brachyura</i>	insectivore	0	1	0	0	0	1
Grey capped camaroptera	<i>Camaroptera brevicaudata</i>	insectivore	0	0	0	1	0	0
Grey capped warbler	<i>Eminia lepida</i>	insectivore	0	0	0	1	0	1
Grey headed sparrow	<i>Passer griseus</i>	granivore	0	0	0	1	0	1
Grey winged robin chat	<i>Cossypha polioptera</i>	insectivore	0	0	0	0	0	1
Grey woodpecker	<i>Dendropicos goertae</i>	insectivore	0	0	0	1	0	0
Grey-backed Fiscal	<i>Lanius excubitoroides</i>	insectivore/car nivore	1	0	0	0	0	0
Greyish eagle owl	<i>Bubo cinerascens</i>	Carnivore	0	0	0	0	0	1
Hadada ibis	<i>Bostrychia hagedash</i>	insectivore	0	1	0	1	0	0
Helmeted Guineafowl	<i>Numida meleagris</i>	omnivores	0	1	0	0	0	0
Holub's golden weaver	<i>Ploceus xanthops</i>	insectivore	0	0	0	1	0	0
Klaas' cuckoo	<i>Chrysococcyx klaas</i>	insectivore	0	0	0	1	0	1
Laughing dove	<i>Streptopelia senegalensis</i>	granivore	0	0	0	1	0	1
Lesser honeyguide	<i>Indicator minor</i>	insectivore/wa x feeder	0	0	0	1	0	0
Lesser Masked Weaver	<i>Ploceus intermedius</i>	granivore	1	0	0	0	0	0
Lesser striped swallow	<i>Cecropis abyssinica</i>	insectivore	1	0	0	1	0	0
Little bee eater	<i>Merops pusillus</i>	insectivore	0	0	0	1	0	0
Little greenbul	<i>Andropadus virens</i>	frugivore	0	0	0	0	0	1
Little Swift	<i>Apus affinis</i>	insectivore	0	1	0	0	0	0
Long-crested Eagle	<i>Lophaetus occipitalis</i>)	Carnivore	0	1	0	0	0	0
Marsh tchagra	<i>Tchagra minuta</i>	insectivore	0	0	0	1	0	1
Northern Black Flycatcher	<i>Melaenornis edolioides,</i>	insectivore	0	1	0	0	0	0
Olive bellied sunbird	<i>Cinnyris chloropygius</i>	insectivore/nec tarivore	0	0	0	1	1	1
Olive sunbird	<i>Cinnyris jugularis</i>	insectivore/nec tarivore	0	0	0	0	0	1
Pale Flycatcher	<i>Bradornis pallidus</i>	insectivore	1	0	0	0	0	0
Papyrus canary	<i>Serinus koliensis</i>	frugivore	0	0	0	1	0	0
Paradise flycatcher	<i>Terpsiphone viridis</i>	insectivore	0	0	0	0	0	1
Parasitic weaver	<i>Ispidina picta</i>	granivore	0	0	0	0	0	1
Pied crow	<i>Corvus albus</i>	omnivores	0	0	0	1	0	0
Pigmy kingfisher	<i>Ispidina picta</i>	insectivore	0	0	0	1	0	1
Pin tailed whydah	<i>Vidua macroura,</i>	granivore	0	0	1	1	0	0
Purple banded Sunbird	<i>Cinnyris bifasciatus</i>	insectivore/nec tarivore	0	1	0	0	0	1

Purple grenadier	<i>Uraeginthus</i>	granivore	0	0	0	0	0	1
	<i>ianthinogaster</i>							
Pygmy kingfisher	<i>Lagonostica</i>	granivore	0	0	0	0	0	1
	<i>senegala</i>							
Rattling Cisticola	<i>Cisticola chiniana</i>	insectivore	1	0	0	0	0	0
Red billed	<i>Lagonosticta</i>	granivore	0	0	0	1	1	1
firefinch	<i>senegala</i>							
Red billed	<i>Buphagus</i>	insectivore	0	0	0	1	0	0
oxpecker	<i>erythrorhynchus</i>							
Red billed Quelea	<i>Quelea quelea</i>	granivore	1	0	0	0	0	0
Red cheeked	<i>Uraeginthus</i>	granivore	0	0	0	1	0	1
cordons bleu	<i>bengalus</i>							
Red chested	<i>Cinnyris</i>	insectivore/nec	0	0	0	1	0	0
sunbird	<i>erythrocerca</i>	tarivore						
Red crested	<i>Cuculus solitarius</i>	granivore	0	0	0	0	0	1
cuckoo								
Red eyed dove	<i>Streptopelia</i>	granivore	0	1	0	1	0	1
	<i>semitorquata</i>							
Red faced	<i>Cisticola erythroptus</i>	insectivore	0	0	1	1	0	1
cisticola								
Red fronted	<i>Pogoniulus</i>	insectivore/fru	0	1	0	0	0	0
Tinkerbird	<i>pusillus</i>	givore						
Red headed	<i>Agapornis</i>	granivore	0	0	0	0	0	1
lovebird	<i>pullarius.</i>							
Red winged	<i>Heliolais</i>	insectivore	0	0	0	0	0	1
warbler	<i>erythropterus</i>							
Red-faced	<i>Sylvietta whytii</i>	insectivore	0	1	0	0	0	0
Crombec								
Red-necked	<i>Fringilla afer</i>	omnivore	0	1	0	0	0	0
Spurfowl								
Ring-necked	<i>Streptopelia</i>	granivore	0	1	0	0	0	0
Dove	<i>capicola),</i>							
Ross's turaco	<i>Musophaga rossae</i>	frugivore	0	0	0	0	0	1
Rüppell's Long-t.	<i>Lamprolaima</i>	omnivores	0	1	0	1	0	0
Starling	<i>purpuropterus</i>							
Scarlet chested	<i>Chalcomitra</i>	insectivore/nec	0	0	1	1	0	1
Sunbird	<i>senegalensis</i>	tarivore						
Scarlet-breasted	<i>Aethopyga</i>	nectarivore	0	1	0	0	0	0
Sunbird	<i>mystacalis</i>							
Senegal coucal	<i>Centropus</i>	omnivores	0	0	0	1	0	0
	<i>senegalensis</i>							
Siffling cisticola	<i>Cisticola</i>	insectivore	0	0	0	0	0	1
	<i>brachypterus</i>							
Singing cisticola	<i>Cisticola cantans</i>	insectivore	0	0	0	0	1	1
Slate-coloured	<i>Laniarius funebris</i>	insectivore	0	1	0	0	0	0
Boubou								
Slender billed	<i>Ploceus pelzelni</i>	insectivore	0	0	0	1	0	0
weaver								
Snowy headed	<i>Cossypha</i>	insectivore	0	0	0	0	0	1
robin chat	<i>niveicapilla</i>							
Speckled	<i>Colius striatus</i>	frugivore	0	1	0	1	0	1
mousebird								
Speckled pigeon	<i>Columba guinea</i>	granivore	0	0	0	0	0	1
Spectacled	<i>Ploceus ocularis</i>	insectivore	0	1	0	1	0	1
weaver								
Spotted	<i>Muscicapa striata,</i>	insectivore	0	1	0	0	0	0
Flycatcher								
Striped kingfisher	<i>Halcyon chelicuti</i>	insectivore	0	0	0	1	1	0
Sulphur breasted	<i>Telophorus</i>	insectivore	0	0	0	0	0	1
bush shrike	<i>sulfureopectus</i>							

Yellow bellied waxbill	<i>Estrilda melanotis</i>	insectivore/gra nivore	0	0	0	1	0	1
Total			13	41	13	60	7	67
