

Supplementary Information

Seasonality habitat type and locality influenced bird assemblage structure in Nigeria

Sulaiman I Muhammad, Rosli Ramli and Amy Y Then

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Appendix S1: Number of individual bird species recorded during dry and wet seasons in Dutse, Nigeria

Species	Dry	Rainy	Total	Black-shouldered Kite (<i>Elanus caeruleus</i>)	7	6	13	Fine-spotted Woodpecker (<i>Campethera punctuligera</i>)	2		2
Abyssinian Roller (<i>Coracias abyssinicus</i>)	46	18	64	Blue-naped Mousebird (<i>Urocolius macrourus</i>)	5		5	Fork-tailed Drongo (<i>Dicrurus adsimilis</i>)	19	1	20
African Cuckoo (<i>Cuculus gularis</i>)	1	3	4	Brown Babbler (<i>Turdoides plebejus</i>)	340	119	459	Four-banded Sandgrouse (<i>Pterocles quadricinctus</i>)		2	2
African Golden Oriole (<i>Oriolus auratus</i>)	1	5	6	Bruce's Green Pigeon (<i>Treron waalia</i>)	20	12	32	Gabar Goshawk (<i>Micronisus gabar</i>)	24	2	26
African Grey Hornbill (<i>Tockus nasutus</i>)	34	38	72	Cattle Egret (<i>Bubulcus ibis</i>)	217	160	377	Grasshopper Buzzard (<i>Butastur rufipennis</i>)	1		1
African Harrier Hawk (<i>Polyboroides typus</i>)	1		1	Chestnut-backed Sparrow Lark (<i>Eremopterix leucotis</i>)	25		25	Great Reed Warbler (<i>Acrocephalus arundinaceus</i>)		1	1
African Palm Swift (<i>Cypsiurus parvus</i>)	98	59	157	Chestnut-bellied Starling (<i>Lamprotornis pulcher</i>)	1070	627	1697	Great Spotted Cuckoo (<i>Clamator glandarius</i>)	1		1
African Scops Owl (<i>Otus senegalensis</i>)		2	2	Chestnut-crowned Sparrow-weaver (<i>Plocepasser superciliosus</i>)	2		2	Greater Blue-eared Starling (<i>Lamprotornis chalybaeus</i>)	471	187	658
African Silverbill (<i>Euodice cantans</i>)	64	47	111	Common Bulbul (<i>Pycnonotus barbatus</i>)	102	23	125	Greater Honeyguide (<i>Indicator indicator</i>)	2	2	4
African Swallow-tailed Kite (<i>Chelictinia riocourii</i>)	1		1	Common Kestrel (<i>Falco tinnunculus</i>)	1	7	8	Green Wood-hoopoe (<i>Phoeniculus purpureus</i>)	101	65	166
African Thrush (<i>Turdus pelios</i>)		5	5	Common Redstart (<i>Phoenicurus phoenicurus</i>)	15		15	Green-backed Heron (<i>Butorides striata</i>)	5		5
Bearded Barbet (<i>Pogonornis dubius</i>)	38	43	81	Common Whitethroat (<i>Sylvia communis</i>)	183		183	Green-winged Pytilia (<i>Pytilia melba</i>)	7	3	10
Beaudouin's Snake Eagle (<i>Circaetus beaudouini</i>)	4	1	5	Crested Lark (<i>Galerida cristata</i>)	56	24	80	Grey Kestrel (<i>Falco ardosiaceus</i>)	2	5	7
Beautiful Sunbird (<i>Cinnyris pulchellus</i>)	4	73	77	Cut-throat Finch (<i>Amadina fasciata</i>)	106	6	112	Grey Woodpecker (<i>Mesopicos goertae</i>)	10	9	19
Black Kite (<i>Milvus migrans</i>)	1	1	2	Dark Chanting Goshawk (<i>Melierax metabates</i>)	2	1	3	Grey-backed Camaroptera (<i>Camaroptera brachyura</i>)	106	49	155
Black Scrub Robin (<i>Cercotrichas podobe</i>)	4		4	Desert Cisticola (<i>Cisticola aridulus</i>)	4		4	Hoopoe (<i>Upupa epops</i>)	4	3	7
Black-backed Cisticola (<i>Cisticola eximius</i>)	3		3	Double-spurred Francolin (<i>Pternistis bicalcaratus</i>)		3	3	House Sparrow (<i>Passer domesticus</i>)	2		2
Black-crowned Tchagra (<i>Tchagra senegalus</i>)	28	22	50	Eastern Olivaceous Warbler (<i>Iduna pallida</i>)	13		13	Lanner Falcon (<i>Falco biarmicus</i>)	2		2
Black-headed Heron (<i>Ardea melanocephala</i>)		1	1	Ethiopian Swallow (<i>Hirundo aethiopica</i>)		4	4	Laughing Dove (<i>Streptopelia senegalensis</i>)	338	183	521
Black-headed Lapwing (<i>Vanellus tectus</i>)	121	17	138					Lesser Whitethroat (<i>Sylvia</i>	1		1

<i>curruca</i>)				<i>platura</i>)				Village Indigobird (<i>Vidua chalybeata</i>)	47	50	97
Little Swift (<i>Apus affinis</i>)	1	7	8	Red-billed Firefinch (<i>Lagonosticta senegala</i>)	40	19	59	Village Weaver (<i>Ploceus cucullatus</i>)	136	38	174
Little Weaver (<i>Ploceus luteolus</i>)	57	66	123	Red-billed Quelea (<i>Quelea quelea</i>)	118		118	Vinaceous Dove (<i>Streptopelia vinacea</i>)	112	130	242
Lizard Buzzard (<i>Kaupifalco monogrammicus</i>)		7	7	Red-cheeked Cordon-bleu (<i>Uraeginthus bengalus</i>)	230	93	323	Western Bonelli's Warbler (<i>Phylloscopus bonelli</i>)	6		6
Long-billed Pipit (<i>Anthus similis</i>)	2		2	Red-necked Buzzard (<i>Buteo auguralis</i>)		2	2	Western Grey Plantain-Eater (<i>Crinifer piscator</i>)	11	5	16
Long-tailed Glossy Starling (<i>Lamprotornis caudatus</i>)	335	251	586	Red-necked Falcon (<i>Falco chicquera</i>)	1	1	2	Western Marsh Harrier (<i>Circus aeruginosus</i>)	1		1
Montagu's Harrier (<i>Circus pygargus</i>)	2		2	Rose-ringed Parakeet (<i>Psittacula krameri</i>)	475	354	829	White helmetshrike (<i>Prionops plumatus</i>)	19	2	21
Mosque Swallow (<i>Cecropis senegalensis</i>)		1	1	Rufous Scrub Robin (<i>Cercotrichas podobe</i>)	9		9	White-billed Buffalo Weaver (<i>Bubalornis albirostris</i>)	1472	910	2382
Namaqua Dove (<i>Oena capensis</i>)	14	3	17	Rufous-crowned Roller (<i>Coracias naevius</i>)	6	17	23	White-headed Barbet (<i>Lybius leucocephalus</i>)	2		2
Northern Anteater Chat (<i>Myrmecocichla aethiops</i>)	16	9	25	Sahel Paradise Whydah (<i>Vidua orientalis</i>)	4	21	25	White-rumped Seedeater (<i>Crithagra Leucopygia</i>)	348	49	397
Northern Black Flycatcher (<i>Melaenornis edolioides</i>)	1	14	15	Scarlet-chested Sunbird (<i>Chalcomitra senegalensis</i>)	41	11	52	Wood Warbler (<i>Phylloscopus sibilatrix</i>)	5		5
Northern Crombec (<i>Sylvietta brachyura</i>)		1	1	Senegal Coucal (<i>Centropus senegalensis</i>)	16	30	46	Woodchat Shrike (<i>Lanius senator</i>)	5		5
Northern Grey-headed Sparrow (<i>Passer griseus</i>)	235	381	616	Senegal Eremomela (<i>Eremomela pusilla</i>)	6	3	9	Yellow-crowned Bishop (<i>Euplectes afer</i>)		4	4
Northern Red Bishop (<i>Euplectes franciscanus</i>)	16	156	172	Senegal Parrot (<i>Poicephalus senegalus</i>)	80	67	147	Yellow Wagtail (<i>Motacilla flava</i>)		2	2
Northern Red-billed Hornbill (<i>Tockus erythrorhynchus</i>)	83	66	149	Shikra (<i>Accipiter badius</i>)		4	4	Yellow-billed Oxpecker (<i>Buphagus africanus</i>)	17	17	34
Northern Wheatear <i>Oenanthe oenanthe</i>	45		45	Speckle-fronted Weaver (<i>Sporopipes frontalis</i>)	121	110	231	Yellow-billed Shrike (<i>Corvinella corvina</i>)	59	59	118
Orange-cheeked Waxbill (<i>Estrilda melpoda</i>)	2	8	10	Speckled Pigeon (<i>Columba guinea</i>)	61	28	89	Yellow-crowned Gonolek (<i>Laniarius barbarus</i>)	19	16	35
Pallid Harrier (<i>Circus macrourus</i>)	1		1	Squacco Heron (<i>Ardeola ralloides</i>)	1		1	Yellow-fronted Tinkerbird (<i>Pogoniulus chrysoconus</i>)	19	2	21
Pearl-spotted Owlet (<i>Glaucidium perlatum</i>)	3	1	4	Subalpine Warbler (<i>Sylvia cantillans</i>)	1		1	Zebra Waxbill (<i>Amandava subflava</i>)		8	8
Piapiac (<i>Ptilostomus afer</i>)	87	86	173	Sudan Golden Sparrow (<i>Passer luteus</i>)	1		1	Zitting Cisticola (<i>Cisticola juncidis</i>)	3	136	139
Pied Crow (<i>Corvus albus</i>)		1	1	Tawny-flanked Prinia (<i>Prinia subflava</i>)	74	99	173	TOTAL	8407	5239	13646
Purple Glossy Starling (<i>Lamprotornis purpureus</i>)	146	45	191	Vieillot's Barbet (<i>Lybius vieilloti</i>)		1	1				
Purple Heron (<i>Ardea purpurea</i>)	1		1								
Pygmy Sunbird (<i>Anthodiaeta</i>	79	9	88								

Appendix S2: Number of individual bird species across woodland and shrubland habitats in Dutse, Nigeria

Species	Shrub land	Wood land	Grand Total	<i>pulchellus</i> Black Kite (<i>Milvus migrans</i>)			<i>superciliosus</i> Common Bulbul (<i>Pycnonotus</i>		
Abyssinian Roller (<i>Coracias abyssinicus</i>)	18	46	64	Black Scrub Robin (<i>Cercotrichas podobe</i>)	2	2	<i>barbatus</i>)	125	125
African Cuckoo (<i>Cuculus gularis</i>)	2	2	4	Black-backed Cisticola (<i>Cisticola eximius</i>)	3	3	Common Kestrel (<i>Falco tinnunculus</i>)	8	8
African Golden Oriole (<i>Oriolus auratus</i>)		6	6	Black-crowned Tchagra (<i>Tchagra senegalus</i>)	47	3	Common Redstart (<i>Phoenicurus phoenicurus</i>)	4	11
African Grey Hornbill (<i>Tockus nasutus</i>)	14	58	72	Black-headed Heron (<i>Ardea melanocephala</i>)		1	Common Whitethroat (<i>Sylvia communis</i>)	118	65
African Harrier Hawk (<i>Polyboroides typus</i>)		1	1	Black-headed Lapwing (<i>Vanellus tectus</i>)	32	106	Crested Lark (<i>Galerida cristata</i>)	43	37
African Palm Swift (<i>Cypsiurus parvus</i>)	15	132	157	Black-shouldered Kite (<i>Elanus caeruleus</i>)	5	8	Cut-throat Finch (<i>Amadina fasciata</i>)	2	110
African Scops Owl (<i>Otus senegalensis</i>)		2	2	Blue-naped Mousebird (<i>Urocolius macrourus</i>)	5	5	Dark Chanting Goshawk (<i>Melierax metabates</i>)	1	2
African Silverbill (<i>Euodice cantans</i>)	11	100	111	Brown Babbler (<i>Turdoides plebejus</i>)	20	439	Desert Cisticola (<i>Cisticola aridulus</i>)		4
African Swallow-tailed Kite (<i>Chelictinia riocourii</i>)		1	1	Bruce's Green Pigeon (<i>Treron waalia</i>)		32	Double-spurred Francolin (<i>Pternistis bicalcaratus</i>)		3
African Thrush (<i>Turdus pelios</i>)		5	5	Cattle Egret (<i>Bubulcus ibis</i>)	100	277	Eastern Olivaceous Warbler (<i>Iduna pallida</i>)		13
Bearded Barbet (<i>Pogonornis dubius</i>)	4	77	81	Chestnut-backed Sparrow		25	Ethiopian Swallow (<i>Hirundo aethiopica</i>)		4
Beaudouin's Snake Eagle (<i>Circaetus beaudouini</i>)		5	5	Lark (<i>Eremopterix leucotis</i>)			Fine-spotted Woodpecker (<i>Campethera punctuligera</i>)		2
Beautiful Sunbird (<i>Cinnyris</i>	10	67	77	Chestnut-bellied Starling (<i>Lamprotornis pulcher</i>)	299	1398	Fork-tailed Drongo (<i>Dicrurus adsimilis</i>)	8	12
				Chestnut-crowned Sparrow-weaver (<i>Plocepasser</i>	2	2			20

Four-banded Sandgrouse (<i>Pterocles quadricinctus</i>)	2		2	Lanner Falcon (<i>Falco</i> <i>biarmicus</i>)		2	2	Northern Red Bishop (<i>Euplectes franciscanus</i>)	16	156	172
Gabar Goshawk (<i>Micronisus</i> <i>gabar</i>)	5	21	26	Laughing Dove (<i>Streptopelia</i> <i>senegalensis</i>)	88	433	521	Northern Red-billed Hornbill (<i>Tockus erythrorhynchus</i>)	16	133	149
Grasshopper Buzzard (<i>Butastur rufipennis</i>)		1	1	Lesser Whitethroat (<i>Sylvia</i> <i>curruca</i>)		1	1	Northern Wheatear <i>Oenanthe</i> <i>oenanthe</i>	26	19	45
Great Reed Warbler (<i>Acrocephalus arundinaceus</i>)	1		1	Little Swift (<i>Apus affinis</i>)	2	6	8	Orange-cheeked Waxbill (<i>Estrilda melpoda</i>)	8	2	10
Great Spotted Cuckoo (<i>Clamator glandarius</i>)		1	1	Little Weaver (<i>Ploceus</i> <i>luteolus</i>)	24	99	123	Pallid Harrier (<i>Circus</i> <i>macrourus</i>)		1	1
Greater Blue-eared Starling (<i>Lamprotornis chalybaeus</i>)	58	600	658	Lizard Buzzard (<i>Kaupifalco</i> <i>monogrammicus</i>)	1	6	7	Pearl-spotted Owlet (<i>Glaucidium perlatum</i>)		4	4
Greater Honeyguide (<i>Indicator indicator</i>)	2	2	4	Long-billed Pipit (<i>Anthus</i> <i>similis</i>)		2	2	Piapiac (<i>Ptilostomus afer</i>)	13	160	173
Green Wood-hoopoe (<i>Phoeniculus purpureus</i>)	19	147	166	Long-tailed Glossy Starling (<i>Lamprotornis caudatus</i>)	51	535	586	Pied Crow (<i>Corvus albus</i>)		1	1
Green-backed Heron (<i>Butorides striata</i>)		5	5	Montagu's Harrier (<i>Circus</i> <i>pygargus</i>)	1	1	2	Purple Glossy Starling (<i>Lamprotornis purpureus</i>)		191	191
Green-winged Pytilia (<i>Pytilia</i> <i>melba</i>)	8	2	10	Mosque Swallow (<i>Cecropis</i> <i>senegalensis</i>)	1		1	Purple Heron (<i>Ardea</i> <i>purpurea</i>)		1	1
Grey Kestrel (<i>Falco</i> <i>ardosiaceus</i>)		7	7	Namaqua Dove (<i>Oena</i> <i>capensis</i>)	11	6	17	Pygmy Sunbird (<i>Anthodiaeta</i> <i>platura</i>)	12	76	88
Grey Woodpecker (<i>Mesopicos</i> <i>goertae</i>)	3	16	19	Northern Anteater Chat (<i>Myrmecocichla aethiops</i>)	1	24	25	Red-billed Firefinch (<i>Lagonosticta senegala</i>)	3	56	59
Grey-backed Camaroptera (<i>Camaroptera brachyura</i>)	102	53	155	Northern Black Flycatcher (<i>Melaenornis edolioides</i>)	5	10	15	Red-billed Quelea (<i>Quelea</i> <i>quelea</i>)		118	118
Hoopoe (<i>Upupa epops</i>)	2	5	7	Northern Crombec (<i>Sylvietta</i> <i>brachyura</i>)	1		1	Red-cheeked Cordon-bleu (<i>Uraeginthus bengalus</i>)	15	308	323
House Sparrow (<i>Passer</i> <i>domesticus</i>)		2	2	Northern Grey-headed Sparrow (<i>Passer griseus</i>)	68	548	616	Red-necked Buzzard (<i>Buteo</i> <i>auguralis</i>)		2	2

Red-necked Falcon (<i>Falco</i> <i>chicquera</i>)	2	2		Tawny-flanked Prinia (<i>Prinia</i> <i>subflava</i>)	105	68	173	(<i>Euplectes afer</i>)			
Rose-ringed Parakeet (<i>Psittacula krameri</i>)	72	757	829	Vieillot's Barbet (<i>Lybius</i> <i>vieilloti</i>)	1		1	Yellow Wagtail (<i>Motacilla</i> <i>flava</i>)		2	2
Rufous Scrub Robin (<i>Cercotrichas podobe</i>)	6	3	9	Village Indigobird (<i>Vidua</i> <i>chalybeata</i>)	1	96	97	Yellow-billed Oxpecker (<i>Buphagus africanus</i>)	4	30	34
Rufous-crowned Roller (<i>Coracias naevius</i>)	8	15	23	Village Weaver (<i>Ploceus</i> <i>cucullatus</i>)	28	146	174	Yellow-billed Shrike (<i>Corvinella corvina</i>)	14	104	118
Sahel Paradise Whydah (<i>Vidua orientalis</i>)	19	6	25	Vinaceous Dove (<i>Streptopelia</i> <i>vinacea</i>)	34	208	242	Yellow-crowned Gonolek (<i>Laniarius barbarus</i>)	12	23	35
Scarlet-chested Sunbird (<i>Chalcomitra senegalensis</i>)	1	51	52	Western Bonelli's Warbler (<i>Phylloscopus bonelli</i>)		6	6	Yellow-fronted Tinkerbird (<i>Pogoniulus chrysoconus</i>)		21	21
Senegal Coucal (<i>Centropus</i> <i>senegalensis</i>)	12	34	46	Western Grey Plantain-Eater (<i>Crinifer piscator</i>)		16	16	Zebra Waxbill (<i>Amandava</i> <i>subflava</i>)	6	2	8
Senegal Eremomela (<i>Eremomela pusilla</i>)	5	4	9	Western Marsh Harrier (<i>Circus aeruginosus</i>)		1	1	Zitting Cisticola (<i>Cisticola</i> <i>juncidis</i>)	77	62	139
Senegal Parrot (<i>Poicephalus</i> <i>senegalus</i>)		147	147	White helmetshrike (<i>Prionops</i> <i>plumatus</i>)		21	21	TOTAL	2570	11066	13646
Shikra (<i>Accipiter badius</i>)	2	2	4	White-billed Buffalo Weaver (<i>Bubalornis albirostris</i>)	712	1670	2382				
Speckle-fronted Weaver (<i>Sporopipes frontalis</i>)	65	166	231	White-headed Barbet (<i>Lybius</i> <i>leucocephalus</i>)		2	2				
Speckled Pigeon (<i>Columba</i> <i>guinea</i>)	1	88	89	White-rumped Seedeater (<i>Crithagra Leucopygia</i>)	52	345	397				
Squacco Heron (<i>Ardeola</i> <i>ralloides</i>)		1	1	Wood Warbler (<i>Phylloscopus</i> <i>sibilatrix</i>)		5	5				
Subalpine Warbler (<i>Sylvia</i> <i>cantillans</i>)		1	1	Woodchat Shrike (<i>Lanius</i> <i>senator</i>)	3	2	5				
Sudan Golden Sparrow (<i>Passer luteus</i>)		1	1	Yellow-crowned Bishop		4	4				

Appendix S3: Bird species richness and diversity as a function of tree and shrub abundance in Dutse, Nigeria

