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# THE BIRDS OF PENDJARI AND ARLI NATIONAL PARKS (BENIN AND UPPER VOLTA)

by A. A. Green and J. A. Sayer

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### INTRODUCTION

Pendjari National Park (27,400 km²) and Arli National Park (800 km²) are contiguous and situated in the Volta Depression across the border between north-western Benin and south-eastern Upper Volta (Fig. 1). They are surrounded by other wildlife reserves, the most notable of which is the "W" National Park (10,000 km²) lying astride the borders of Upper Volta, Niger and Benin and taking its name from the W-shaped bend in the River Niger which marks its north-eastern boundary. Quartzite cliffs of the Atacora range forming the southern boundary of the Volta Depression, mark the limit of the Pendjari National Park. The terrain of the parks is generally flat with an elevation of 160-200 m. There is a range of low hills of jaspes and quartzite in the Pendjari Park and some sandstone escarpments 100 m high at Tambarga, Gobnangou and Pagou in the Arli Park. South of these escarpments the bedrock is shale while to the north it is granite.

The parks lie within the Sudan savanna zone, the 1,000 mm isohyet and the 27.5° isotherm passing through Arli Park and the 1,100 mm isohyet passing through the southern part of the Pendjari Park. The rainy season lasts from early May until September with heaviest rainfall in August. Temperatures are moderate at this time (20° to 35°C), but during the dry season when the dusty harmattan wind blows from the north east, nights are cool (9° to 18°), days hot (33° to 37°), and humidity very low. In the late dry season in March and April it is extremely hot with night time minima of 27° to 30° and day time maxima of 39° to 44°C.

with its source in the Atacora range the Pendjari river flows throughout the year, and has an extensive floodplain with numerous marshes and ponds. These are replenished by the rains and in September by the annual inundation of the floodplain by the river itself. All other rivers are seasonal; one of the principal ones, the Arli river, retains large pools in its bed throughout the year. The only other water in the area in the dry season is some pools in the Pantiani, Podiega and Yapiti streams. One very isolated waterhole at Bali in the Podiega floodplain is significant, being the only water source in the centre of the Pendjari Park in the late dry season. Several rare and accidental birds have been seen there.

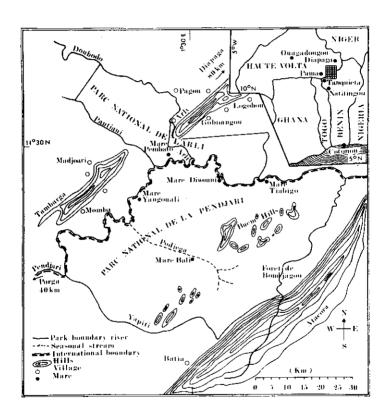


Figure 1. Map of Pendjari National Park (Benin) and Arli National Park (Upper Volta).

The parks were created in 1954 to protect the endemic large mammals. Particularly common are Buffalo Syncerus caffer, Hippopotamus Hippopotamus amphibius, Western Kob Kobus kob, Defassa Waterbuck K. defassa, Roan Antelope Hippotragus equinus, Western Hartebeest Alcelaphus buselaphus and Warthog Phacochoerus aethiopicus (Green 1979; FAO 1979). Other animals typical of the sudano-guinean zone also occur, including six more antelopes and four species of primates. Lions Panthera leo, Leopards Panthera pardus, Cheetah Acinonyx jubatus and Spotted Hyaena Crocuta crocuta also occur and their presence certainly influence the abundance and status of raptorial and scavenging birds.

There have been very few studies of the birds of Benin. Berlioz (1956) studied a small collection from the south of the country and Brunel (1958) published some observations also mainly from forested areas near the coast. Villiers (in Dekeyser 1951) gave an account of a collection made during a two week visit to an area south west of the Pendjari park, but the park itself was not studied. Thiollay (1977) has information on raptors seen during some brief visits to the parks. The present paper is based upon field work carried out while conducting surveys of the two parks in connection with the preparation of management plans (FAO 1979). A.A.G. has spent six years in the area in both of the parks and J.A.S. worked in the Pendjari for four years. The parks are normally inaccessible in the rainy season but A.A.G. has visited the area by boat and on foot then; however, our work has been much more intensive in the dry season.

The bird fauna of the parks is typical of the sudano-guinean zone, but special geomorphological features - particularly the cliffs and rocky habitats of the escarpments and the wetlands of the Pendjari floodplain - result in a bird fauna richer than that the parks' environs. Raptors are particularly varied and abundant, presumably because of the almost total absence of disturbance by man and the consequent abundance of small mammals, carrion of large mammals, and of birds of species which are hunted outside the protected areas.

Although birds are protected within the parks, two recent developments pose threats to some species. It is becoming increasingly common for poachers to poison the waters of the parks with agricultural pesticides misappropriated for the purpose. Endrin has been used, and very large numbers of fish and some large mammals killed as a result. We have no direct evidence of deaths of birds, but they must be threatened by sub-lethal poisoning if they eat contaminated carrion: fish-eating birds must also be affected. The second threat stems from the possibility that aerial spraying of insecticides may be used to control tsetse flies Glossina spp. to prevent them spreading into surrounding populated areas. Parts of the "W" park have already been sprayed with endosulphan, and although this insecticide is of rather low avian toxicity, it may affect insectivorous birds via non-target invertebrates. Endosulphan is highly toxic to fish and its use in the "W" park has resulted in the elimination of 90% of the fish from the Mekrou river, the park's

principal water course, presumably with adverse consequences for fish eating birds. Long term changes in the use of the land, which would result from these areas being opened up to humans and cattle, would also pose a threat to the conservation of natural communities.

### DISCUSSION

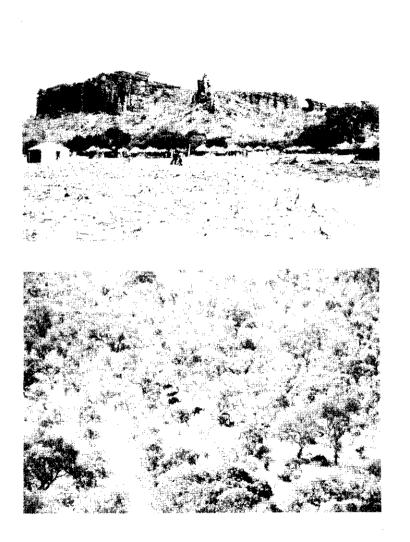
The Appendix lists the 278 species of birds that we have recorded in the area. We have attempted to indicate the migratory status and abundance of each, except those of which we have few observations. Records of certain inconspicuous species relate only to those few occasions when we used mist nets. The habitat in which we have recorded each species is shown; we recognise six main habitats supporting distinctive bird communities: riparian, dry floodplain, wetland, cliffs and rocky areas, savanna, and areas of human habitation. Scientific nomenclature follows White (1960-65) and common names Mackworth-Praed & Grant (1970).

### Riparian

There is a fringing forest of Parinari congensis, Cola laurifolia, Syzygium quineense, Pterocarpus santalinoides, etc. on the banks of the larger streams and rivers. Further back from the water courses there is often a levee dominated by Borassus aethiopium, Daniellia oliveri, Anogeissus leiocarpus, Terminalia spp., and Combretum spp. At Bondjagou, where the Pendjari river cuts through the Atacora range, there is a well developed gallery forest. Although the habitat is rich in birds, few true forest species have been recorded. Records of the Fantee Rough-Wing Swallow Psalidoprocne obscura, Sulphur-breasted Bush-Shrike Malaconotus sulfureopectus and Superb Sunbird Nectarinia superba from Bondjagou forest are the most northerly for Benin. A Little Bittern Ixobrychus minutus was observed in the riparian zone near the Mare Diwouni in September 1977 when the floodplain and marshes were entirely inundated. A solitary Skimmer Rhyncops flavirostris was seen just outside the park boundary on the Pendiari river west of the Yapiti in March 1977. White-headed Plover Vanellus albiceps, common along the Mekrou river in "W" park, is rare and irregular on the Pendjari.

### Dry floodplain

There are extensive areas of open grasslands fringed by savannas dominated by Acacia sieberiana, Mitragyna inermis, or by Terminalia macroptera. They are only flooded for a brief period in the rainy season, but the soils are water-logged for several months. They burn early in the dry season and become the habitat of White Storks Ciconia ciconia of which flocks of 20 to 60 birds are recorded each year in late November or December. Abdim's Stork C. abdimii appears



Figures 2 and 3. Fig. 2 (upper), hill and cliff habitat, Falaise de Tambarga. Fig. 3 (lower), savanna habitat, Pendjari National Park.

each year just before the onset of the rains (there is a single record for February). Crowned Cranes Balearica pavonina are quite common in the dry season, but numbers fluctuate from year to year. Several hundred were present around the Mare Diwouni in early 1975. Denham's Bustard Neotis denhami is common. The Secretary Bird Sagittarius serpentarius is present in small numbers throughout the dry season.

### Wetlands

Several, but not all, of the large shallow open-water lakes dry up during the dry season. Some are surrounded by tall grasses and shrubs; others, particularly those regularly visited by the large herbivores, have open, muddy margins suitable for waders. Large concentrations of water birds such as those found on the Niger river do not occur, but several species of ducks, storks and herons occur in small numbers. The Saddle-bill Ephippiorhynchus senegalensis breeds in the area, and the Open-bill Anastomus lamelligerus is rare although we have recorded it frequently in the "W" park along the Niger river. We have isolated records of Pink-backed Pelican Pelecanus rufescens, Osprey Pandion haliaetus, White-winged Black Tern Sterna leucoptera and Black Tern S. nigra.

### Hill and cliffs (Fig. 2)

The rocky cliffs are sparsely wooded with Burkia africana, Detarium microcarpum, Lannea acida, Sterculia setigera, and Combretum ghasalense. On deeper soils on the summits of the Gobnangou and Atacora escarpments a wooded savanna of greater species diversity occurs, dominated by Isoberlinia doka and Afzelia africana. Cliff Chats Myrmecocichla cinnamomeiventris occur on many of the rocky escarpments. Hall and Moreau (1970) describe only the white-crowned form M. c. coronata from this area, but we have (as yet unsubstantiated) observations of males with the black crowns characteristic of the westerly subspecies M. c. bambarae and M. c. cavernicola. If sympatry of two of these forms is confirmed then their subspecific status would need to be reviewed. The Rock-living Cisticola Cisticola aberrans is common on the Gobnangou escarpment but has not been recorded further south.

### Savanna (Fig. 3)

The largest area of the parks is covered by wooded or scrub savanna; the former contains those tree species mentioned for the rocky habitats, with Pterocarpus erinaceus and Butyrospermum paradoxum. The scrub savanna is dominated by Combretum spp., Acacia spp. and Crossopteryx febrifuga. This habitat is poor in bird species; the arid scrub areas have fewer birds than the more humid, more densely wooded ones in the southern part of the region. The

African Oriole Oriolus auratus and the Bearded Barbet Lybius dubius are more frequent in the south. Species occurring in the driest areas include the Red-billed Hornbill Tockus erythrorhynchus, Heuglin's Red-breasted Wheatear Oenanthe heuglinii, Vieillot's Barbet Lybius vieilloti, Red-tailed Bush-lark Mirafra nigricans and Temminck's Courser Cursorius temminckii. The Yellow-mantled Widow-bird Euplectes macrourus, which is quite frequent in Pendjari park, has not been recorded north of the Pendjari river floodplain.

### Human occupation sites

The parks are uninhabited except for a small number of staff who remain throughout the year at the Pendjari hotel near the Mare Diwouni and for a few families of fishermen at Arli village. Certain species associated with villages are not encountered in the parks except in these two locations. The Pied Crow Corvus albus is common both to the north and south of the parks, but has not been recorded from within their boundaries. The Red-rumped Swallow Hirundo daurica is quite scarce in the parks, but is abundant in the surrounding villages. Weaver-birds are particularly abundant around the Pendjari hotel and around villages outside the park boundaries.

The parks are notable for their abundance of raptors. This can perhaps be attributed to the vast area of parks and reserves with its sparse human population and to the high density of mammals. From game censuses in 1973-74 we have estimated that the herbivore biomass exceeds 2,000 kg/km² for Arli National Park (Green 1979). Vultures are associated with the large population of game animals. Up to 12 Lappet-faced Vultures Aegypius tracheliotus have been seen together at the Mare Nabindo west of Arli park. The Ruppell's Griffon Gyps ruppellii breeds in the dry season (October-May) on the cliffs of Pagou and Tambarga adjacent to Arli park (Green 1977). This species is known to breed in West Africa only in a very few locations in Cameroon, Nigeria, Mali and Senegal.

The Bateleur Terathopius caudatus was noted by Thiollay (1977) as being ten times more abundant in the parks than elsewhere in the area; it breeds in tall trees along the Pendjari river. In 1976-77 a pair nested in a Daniellia oliveri next to our camp at Mare Diwouni; in October 1978 a pair appeared to be preparing to nest again here. Short-toed Eagles Circaetus gallicus are common in the savanna, but we have not observed the Brown Harrier-eagle C. g. beaudouini which was recorded by Thiollay (1977) from Pendjari park. Thiollay also recorded the Hobby Falco cuvieri from the Borassus aethiopium woodlands along the Pendjari river; we have recorded the Red-necked Falcon Falco chiquera only in this habitat, where it is quite frequent. The Fish Eagle Haliaetus vocifer breeds commonly along the Pendjari and Arli rivers. Of the harriers we have found Montagu's Circus pygargus to be much more common than the Pale Circus macrourus.

Verreaux's Eagle-owl Bubo lacteus breeds near Mare Diwouni, where a pair was observed in 1977 from January to July and in 1978

from July to December. This species was also observed along the Arli river south of Arli village in April 1974. The Fishing Owl Scotopeli peli has been observed during boat trips on the Pendjari river and along the Arli river near Pagou. In December 1972 a single Marsh Owl Asio capensis was killed by a vehicle near the Pantiani stream in the west of Arli park.

### **ACKNOWLEDGEMENTS**

This work was carried out while A.A.G. was assigned by the Peace Corps to the forestry service in Upper Volta from 1971 to 1975, and to an FAO/UNDP national park's development project in Benin from 1976 to 1978. J.A.S. was assigned to this project in Benin from 1974 to 1978. We are grateful to the directors of the Peace Corps in Upper Volta and Benin and to FAO for permission to publish this paper.

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  - A. A. Green and J. A. Sayer\*, FAO/UNDP, Projet d'Amenagement de la Faune et des Parcs Nationaux, B.P. 506, Cotonou, Republique Populaire du Benin
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ANNOTATED LIST OF BIRDS OBSERVED IN PENDJARI AND ARLI NATIONAL PARKS (BENIN AND UPPER VOLTA) DURING 1972-1978 APPENDIX,

to	Sequence and nomenclature follow White (1960-65).
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P, palaearctic A, intra-African migrant; A, one or two sightings; B, rare; C, frequent; D, common; E, abundant. I, irregular visitor; w, regroent whose year; migrant. Abundance Status

Indicates the months during which the species has been observed. A cross indicates a definite breeding record within the parks.

Nesting

Habi tat

Month

The The habitats in which each species is most commonly observed is indicated by a cross. habitats are

A: Riparian B: Dry floodplain D: Cliffs and rocky hills E: Savanna

F: Human occupation site.

C: Wetland

Gaps in the table indicate that inadequate information was available.

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trosus R D x 1-12 x x Himancopus himantopus P B 1,3  trosus R D x 1-12 x x Himancopus himantopus P C 11-4  AE R X 1-12 x X GLAREOLIDAE  Pluvianus aegyptius I A 2,4  Cursorius temminckii A 1  C. chalcopterus B 3-4  Inhancola pratincola  C x 11-6 x X Rhuncops flavirostris I A 3	Francolinus bicalcaratus	ፎ		1-12	×	×	Calidris minuta	Д	Æ	<b>-</b>		×	
trosus R D x 1-12 x x Himantopus himantopus P C 11-4  is R E x 1-12 x x GLARBOLIDAE  AE Pluvianus aegyptius I A 2,4  cursorius temminckii A 1  C. chalcopterus B 3-4  nina R C x 1-12 x Glareola pratincola C 1-4  IARIDAE  C x 11-6 x x Rhuncops flavirostris I A 3	Coturnix sp.		Ü	11-3	×		Philomachus pugnax	Д	Д	1,3		×	
is         R E x 1-12         x         GLAREOLIDAE           AE         Pluvianus aegyptius         I A 2,4           ensis         R C 1-12         X         Cursorius temminckii         A 1           C. chalcopterus         B 3-4           nina         R C x 1-12         X X         Glareola pratincola         C 1-4           C x 11-6         X         Rhuncops flavirostris         I A 3	Ptilopachus petrosus	ĸ			×	×	Himantopus himantopus	Д	U	11 - 4		×	
AE Pluvianus aegyptius 1 A 2,4 ensis R C 1-12 x Cursorius temminckii A 1 C. chalcopterus B 3-4 nina R C x 1-12 x Clareola pratincola C 1-4 LARIDAE C x 11-6 x x Rhuncops flavirostris I A 3	Numida meleagris	ĸ			×	×	GLAREOLIDAE						
ensis R C 1-12 x Cursorius temminckii A 1 C. chalcopterus B 3-4 nina R C x 1-12 x x Clareola pratincola C 1-4 LARIDAE C x 11-6 x x Rhuncops flavirostris I A 3	HELIORNITHIDAE						Pluvianus aegyptius	Τ	∢	2,4	×		
nina R C x 1-12 x x Glareola pratincola C 1-4  LARIDADE C x 11-6 x x Rhuncops flavirostris I A 3	Podica senegalensis	æ	Ç	1-12	×		Cursorius temminckii		Ø	<del></del>	×		
nina R C x 1-12 x x Glareola pratincola C 1-4 LARIDAE C x 11-6 x x Rhuncops flavirostris I A 3	GRUIDAE						C. chalcopterus		മ	3-4			×
C x 11-6 x x Rhuncops flavirostris I A 3	Balearica pavonina	ፚ					Glareola pratincola		ပ	1-4		×	
$C \times 11-6 \times \times  Rhuncops\ flavirostris I A 3$	OTIDAE						LARIDAE						
the state of the s	Neotis denhami		S	11-6	×	×	Rhyncops flavirostris	Η	A	<b>س</b>	×		

SPECIES	SUTATS	ABUNDANCE NESTING	MONTH	HABITAT ABCDE	AT E F	SPECIES	SUTATE	ABUNDANCE NESTING	MONTH	HABITAT ABCDE	TAT DEF
Sterna leucoptera	1 1	er:	4	×		STRIGIDAE					
S. nigra	1	ď	1,3	×		Tyto alba	ĸ	χ m	1-12	×	
PTEROCLIDIDAE						Otus scops	æ	Ω	1-12	×	×
Pterocles quadricinctus	_	۵	11-5		×	O. leucotis		Ø	σο	×	
TURNICIDAE						Bubo africanus	×	ວ	1-12		×
Turnix sylvatica		×	1-4	×		.B. lacteus	æ	Вх	1-12	×	×
Ortyxelos meiffrenii	-	Æ	12	×		Scotopelia peli		ш	2,8	×	
COLUMBIDAE						Glaucidium perlatum	œ	Δ	1 - 12	×	×
Columba guinea	ĸ	×	1-12	×		Asio capensis		Æ,	12,1	×	×
Streptopelia semitorguata	r.	Ω	1-12	×		CAPRIMULGIDAE					
S. vinacea	æ	×	1-12	×	×	Caprimulgus tristigma	ď	υ	1-12		×
S. senegalensis	~	۵	1-12		×	C. climacurus		Ø	1-2	×	
Oena capensis	_	۵	11-6	×	×	Macrodipteryx longipennis	at	O	11-5	×	×
Turtur abyssinicus	~	62	1-12	×	×	APODIDAE					
Treron waalia	~	G.	1-12	×	×	Apus melba		Ą	-	×	
T. australis	_	<b>( )</b>	12-4	×	×	A. apus	凸	U	10-4	×	×
Poicephalus senegalus	~	Δ	1-12	×	×	A. caffer		ø	-	×	
PSITTACIDAE						A. affinis	ĸ	×	1 - 12		×
Psittacula krameri wncobbactbae	œ.	υ	1-12	×	×	Cypsiurus parvus	ĸ	ЭX	x 1-12	×	×
MUSUPRAGIDAE	ı					ALCEDINIDAE	-	i	•		
musopnaga violacea	×	1	71-17	×		Ceryle maxima	OK.	υ	1-12	×	
Crinifer piscator	~	۵	1 - 12	×	×	C. rudis	ĸ	U	1 - 12	×	
CUCULIDAE						Alcedo quadribrachys		Д	4	×	
Clamator jacobinus		<b>6</b>	1-2		×	A. cristata	æ	Ω	1-12	×	
C. levaillantii	~	t)	1-4	×	×	Ceyx picta	æ	Ω	1-12	×	×
Cuculus canorus P	P,R (	U	1,4,8		×	Halcyon senėgalensis	ĸ	ы	1 - 12	×	×
Centropus toulou		кC	11	×		H. malimbica	24	Ω	1-12	×	
C. senegalensis	2	<u>[4]</u>	1 - 12	×	×	H. chelicuti	œ	Δ	1 - 12		×

SPECIES	SUTATZ	ABUNDANCE	MONTH MONTH	A H	HABITAT B C D E F	SPECIES		SUTATE	PBUNDANCE NESTING	MONTH	HABITAT ABCDE	ТАТ D В F
H. leucocephala		υ	1-4,9	×		C. abingoni	ŭ 2	p	a; (	1-12	××	*
Mercos orientalis		U	12-8		×	Mesopicos goertae		4 04	טנ	1-12	•	: ×
M. nubicus		×		×	×	ALAUDIDAE						
M. albicollis	ď	Д	10-11		×	Mirafra javanica			œ.	4	×	
M. pusillus		М	12-1,9	×		M. rufocinnamomea		æ	ບ	1-12		×
M. bulocki	œ	ы	x 1-12	×		M. nigricans			·m	m		×
CORACIIDAE						Eremopterix leucotis	S		Ω	12-4		×
Coracias garrulus	д	Ф	12-1	×		HIRUNDINIDAE						
C. abyssinica	ρ;	Ω	1-12	×	×	Riparia riparia		μ	æ	4	×	
C. cyanogaster		U	12-4	×	×	R. paludicola		Ж	x O	1-12	×	
Eurystomus glaucurus	4	ပ	3-11	×		Hirundo rustica		P,R C	ပ	1-12	×	
UPUPIDAE						H. smithii		ĸ	ф	8-1	×	
Upupa epops		υ	11-5		×	H. senegalensis			മ	4	×	
Phoeniculus purpureus	æ	Ω	1 - 12	×	×	H. daurica		ď	Д	1-12	×	×
P. aterrimus		ပ	1-12	×	×	H. abyssinica			υ		×	
BUCEROTIDAE						H. griseopyga			щ	10-4	×	
Tockus nasutus	R, A	R,A D	1-12		×	H. fuligula			Æ	4		×
<ol> <li>erythrorhynchus</li> </ol>	æ	ပ	1 - 12		×	Delichon urbica			æ	1	×	
Bucorvus abyssinicus	œ	Ų	1-12	×	×	Psalidoprocne obscura	ra		æ	4	×	
CAPITONIDAE						MOTACILLIDAE						
Lybius dubius		υ	1-12		×	Motacilla flava		ρι	щ	3-4	×	
L. vieilloti		ט	1 - 12		×	M. alba			ď	7	×	
Pogoniulus chrysoconus	<u>~</u>	O	1-12		×	: Anthus trivialis		Д,	Æ	Ŋ	×	
INDICATORIDAE						A. cervinus		щ	ø	m	×	
Indicator indicator	ᅂ	υ	1-12	×	×	LANIIDAE						
PICIDAE						Prionops plumata		ĸ	ပ	1-12		×
Campethera punctuligera		Ø	7	×		Dryoscopus gambensis	S	œ	Д	1-12	×	×

SPECIES	SUTATE	VENUDANCE VESTING	MONTH	HAE	HABITAT B C D E F	SPECIES	SUTATS	MESTING ABUNDANCE	MONTH	HABITAT ABCDEF
Tchagra senegala	×	Δ	1-12		×	Cercomela familiaris		Æ	4	*
Laniarius barbarus	æ	Ω	1-12	×		Myrmecocichla	æ	Ü	1 - 12	×
naiaconotus sulfureopectus		Æ	4	×		Phoenicurs phoenicurs	Ъ	Ö	12-2	×
M. blanchoti		ø			×	Cossypha albicapilla	ď	ט	1-12	×
Corvinella corvina	ĸ	Ω	1-12	×	×	C. niveicapilla	ĸ	Ö	1-12	×
Lanius senator	Ы	U	12-3	×		Luscinia svecica	Д	ĸ	-	×
ORIOLIDAE						Turdus pelios	ĸ	Ŋ	1-12	×
Oriolus auratus	R,A C	Ų	1-12	×	×	Turdoides plebejus	Ж	U	1-12	×
DICRURIDAE						T. reinwardii		щ	2	×
Dicrurus adsimilis	ĸ	Д	1-12	×	×	Acrocephalus arundinaceus	S P	Æ		×
STURNIDAE						Hippolais pallida		æ		×
Lamprotornis purpureus	ĸ	U	1-12	×	×	Phylloscopus trochilus	Д	Ø	2	×
L. caudatus	М	ſω	1-12	×	×	P. collybita	Д	Ą	2	×
Cinnyricinculus	ĸ	ū	7 2 7	;	,	Cisticola erythrops		Ω	2-9	×
leucogaster	Ç	Ď.	11017	<	<	C. aberrans	ĸ	Q	1-12	×
Buphagus africanus	œ	ပ	1-12	×	×	C. natalensis		Ω	3	×
CORVIDAE						C. juncidis		ပ	4	×
Ptilostomus afer	щ	Ω	1 - 12	×	×	Prinia subflava	C.	Д	1 - 12	×
Corvus albus	ĸ	U	1-12		×	Camaroptera brachyura		ш	1,7	×
CAMPEPHAGIDAE						Eremomela pusilla		O	7,11	×
Campephaga phoenicea	I	m	4,7-8	×		Sylvietta brachyura		ш	8-9	×
PYCNONOTIDAE						Muscicapa aquatica			7	×
Pycnonotus barbatus	ĸ	Ω	1-12	×	×	M. caerulescens			2,7	×
MUSCICAPIDAE						Ficedula hypoleuca	Д	Æ	4	×
Saxicola rubetra	Δŧ	ပ	1-4		×	Melaenornis edolioides	œ	O	1-12	×
Ocnanthe oenanthe	д	Ç	1-2	×		Bradornis pallidus		Ø	12	×
Dortton C		ر	1-4		>	Batic senegalonsis	C	{	,	

SPECIES	SUTATZ	PECTING PECTING	MONTH	HABITAT ABCDE	TAT	SPECIES	SUTATZ	ABUNDANCE NESTING	MONTH	HAI A B C	HABITAT B C D E	ſ±,
Platysteira cyanea	pz;	Д	1-12	×		E. hordaceus		O	7-11	×	×	×
Trochocercus longicauda	œ	U	1-12	×		E. macrourus		ပ	7-11		×	×
Terpsiphone viridis	æ	υ	1-12	×	×	E. orix		Ω	6-12	×	×	×
PARIDAE						Passer griseus		ບ	1-2			×
Parus leucomelas	æ	ပ	1-12	×	×	Petronia dentata		ບ	·1		×	
REMIZIDAE						Vidua macroura	œ	ပ	1-12	×	×	×
Remiz parvulus	æ	Ω	1-12	×	×	V. chalybeata	24	'n	1-12		×	×
NECTARINIIDAE						V. orientalis	œ	ပ	1-12	×	×	×
Anthreptes longuemarei	ρĸ	ပ	1-12	×		Pytilia hypogrammica		æ	-		×	
A. platura	œ	υ	1-12		×	P. phoenicoptera		ပ	2,10-11 x	×		
Nectarinia senegalensis	œ	O	1-12	×	×	Estrilda melpoda	œ	Δ	1-12	×	×	
N. puchella	æ	υ	1-12	×	×	E. troglodytes		М	2			
N. superba		Ą	4	×		E. caerulescens	ß,	Ω	1-12	×	×	×
ZOSTEROPIDAE						E. bengala	æ	ပ	1-12	×	×	×
Zosterops senegalensis	æ	Q	1-12	×	×	E. larvata		ф	12-1,8	×	×	
EMBERIZIDAE						Lagonosticta senegala	æ	Ω	1-12	×	×	×
Emberiza flaviventris		В	2-3		×	L. rubricata	æ	а	1-12	×	×	×
E. tahapisi		ပ	7,111		×	Ortygospiza atricollis		ပ	4	×		
FRINGILLIDAE						Lonchura malabarica		щ	3,12		×	×
Serinus mozambicus		υ	1-12		×	L. cucullata		Ω	1-12		×	
PLOCEIDAE												
Ploceus luteolus	œ	χ U		×								
P. velatus	œ	ς Σ	1-12	×								
P. cucullatus	ď	X Q		×	×							
P. melanocephalus	æ	Ŋ		×								
Quelea erythrops	æ	Ü	7,9	×								
O. quelea		Ų	4,8-9	×	×							
Euplectes afer		U	7-10	×	×							