

## NAMIBIA BIRD CLUB

a branch of the Scientific Society of Namibia  
and the  
Southern African Ornithological Society

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## BIRDS OF THE WEST CAPRIVI STRIP, NAMIBIA

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## SUMMARY

A socio-ecological survey of the West Caprivi Strip from 2-17 April 1990 provided an opportunity to produce the first comprehensive list of birds for the region. 285 bird species were recorded, bringing the total for the region to 339 species. At least 71 additional species are expected, these being birds confirmed from both the adjacent regions of Kavango and East Caprivi. Riparian woodland and wetland habitats were identified as of greatest conservation importance in the West Caprivi, as 54% and 42% of the birds in these respective habitats are listed in the Namibian Red Data Book on birds.

## INTRODUCTION

The avifauna of the West Caprivi Strip, Namibia, is almost unknown. The area was closed to all but military personnel for over 20 years, and only in 1989 were members of the Directorate of Wildlife and Conservation allowed limited access to certain parts of the area, despite the fact that most of the West Caprivi has been a proclaimed game park since 1963.

The adjacent areas of the Kavango and East Caprivi, to the west and east respectively, have been better studied. A total of 417 bird species have been recorded in the Kavango (Winterbottom 1966; Clancey 1980; Hines 1985-7; Namibian Bird Atlas Project (NBAP)) and 430 species in East Caprivi (Leppan 1944; Smithers 1964; Kemp 1971; Koen 1988; NBAP).

The first list of birds for the West Caprivi was that of Tinley (1966), who undertook the first ecological survey of the area in May and June 1966. He recorded 188 species, but listed only those birds which he considered were confined to the northeast of Namibia in the tropical woodland and floodplain biotas (62 species). In 1970 Kemp (1971) spent a week on the west bank of the Kwando River, on the extreme eastern side of the West Caprivi, where he recorded 112 species. A bird atlas project has been running in Namibia since 1977 (now part of the Southern African Bird Atlas Project) and data are collected per quarter degree square per month, or parts thereof. Most of the data for the West Caprivi come from sightings along the public road linking Kavango and East Caprivi, and only in

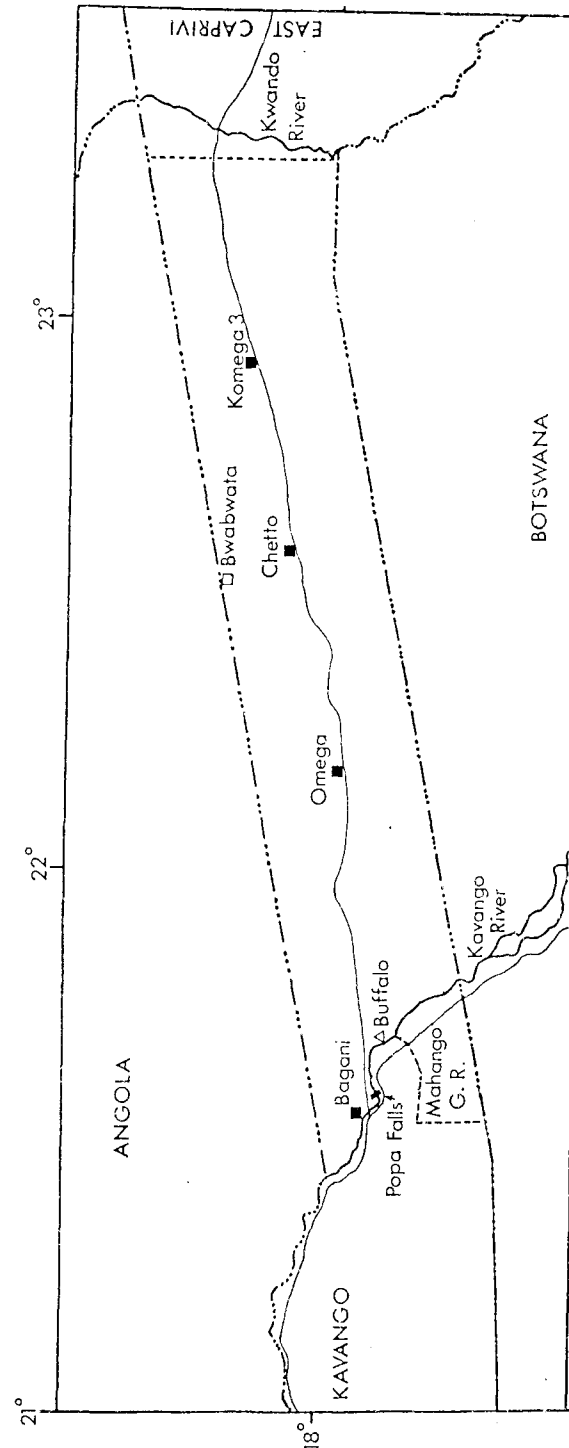


FIGURE 1: The West Caprivi Strip, showing the main features of the region, including the public road running through the centre and the rivers forming the east and west boundaries.

the past year has better coverage of the area been obtained, on an opportunistic basis, by Directorate of Wildlife and Conservation staff.

From 2-17 April 1990 a socio-ecological survey of the West Caprivi Strip was carried out by a multi-disciplinary team to propose a land-use plan for the region. This survey provided the first opportunity to obtain good coverage of the avifauna of the West Caprivi Strip. All important habitats were visited, as were 13 of the 19 quarter degree squares in the region.

#### STUDY AREA

The West Caprivi Strip (Figure 1) is about 180 km long and 32 km wide. It is bounded to the west and east by the Kavango and Kwando Rivers respectively, to the north by Angola and the south by Botswana. The area lies at just under 1000 m above sea level and receives about 650 mm of rain per year, mostly as summer thunderstorms. The rate of evaporation is about three times that of the annual rainfall. Frost is rare and usually confined to the drainage lines.

The area is composed of three physiographic features (Tinley 1966): (a) the perennial rivers and flood plains of the Kavango and Kwando Rivers, (b) a parallel system of drainage lines (omirumba, plural; omurumba, singular) which trend ESE-WNW between the two perennial rivers, and (c) the extensive, deep, aeolian Kalahari sands, in places formed into linear dunes 30-60 m high and supporting large tree woodlands. The habitats recognised within each of the physiographic features (Tinley 1966; Hines 1985-7) are as follows:

##### (a) Kavango and Kwando Rivers

- (i) Open water - permanent, flowing water of the main river, side channels and including sandbanks and reed beds of mainly Phragmites spp.
- (ii) Back swamps, oxbow lakes and floodplains - stagnant water and seasonally flooded areas, dominated by Phragmites spp., Cyperus papyrus and floating mats of Echinochloa grasses. Areas flooded only in years of above average rainfall are dominated by grass and sedge species.
- (iii) Riparian woodland/forest - varies from relatively open woodland to tall, dense forest, characterised by Diospyros mespiliformis, Garcinia livingstonei, Lonchocarpus capassa, Acacia nigrescens and Phoenix reclinata and Hyphaene palms, the latter usually in shrub-form.

##### (b) Omirumba

This habitat has temporary, non-flowing water from local precipitation, but large areas of omirumba never flood. The lower regions are dominated by short to tall grasses while the margins support Acacia, Combretum and Croton spp., Dichrostachys cinerea and Ziziphus mucronata.

##### (c) Woodlands

This habitat description covers short (usually <5 m in height) to tall (>10 m) deciduous woodland on Kalahari sands. Characteristic trees are Burkea africana, Pterocarpus angolensis, Baikiaea plurijuga, Guibortia coleosperma, several Grewia and Combretum species and a sparse to moderate grass cover of mainly Aristida and Stipagrostis spp.

#### SYSTEMATIC LIST

A total of 285 bird species were recorded during the socio-ecological survey in April 1990, bringing to 339 the number of birds recorded for the West Caprivi (Table 1). The only species recorded for the West Caprivi not also recorded in one or (usually) both of the adjacent regions of Kavango and East Caprivi was that of the Redthroated Twinspot. A family party of five birds (including two males) was unexpectedly recorded on the edge of the Kavango River about 6 km SE of Buffalo in an Acacia thicket surrounded by flooded grassland.

At least 71 additional species are likely to be recorded for the West Caprivi, these being species confirmed for both adjacent regions of Kavango and East Caprivi. Table 1 also lists the habitat preferences of the birds as well as an indication of their status (common, uncommon or rare) in the region.

#### DISCUSSION

The conservation status of the birds of the West Caprivi, within their preferred habitats, is given in Table 2. The most threatened group of birds are those restricted to the riparian woodland, with over 50% listed in the Namibian Red Data Book of birds (Williams & Brown in prep). These are followed by wetland birds at 42%. In all other habitats, on average about 10% (range 0-17%) of the species recorded are listed in the Red Data Book. It is clear that in the West Caprivi, and indeed, throughout the northern regions of this country, the habitats that should obtain the highest conservation priority are the riparian woodlands and the various wetland systems.

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TABLE 1

Birds recorded in the West Caprivi Strip (a) during this survey (2-17 April 1990), (b) as part of the Namibian Bird Atlas Project (NBAP), (c) by Tinley (1966) and (d) by Kemp (1971), and birds recorded in adjacent regions of (e) Kavango (Winterbottom 1966; Clancey 1980; Hines 1987; NBAP) and (f) East Caprivi (Leppan 1944; Smithers 1964; Kemp 1971; Koen 1989; NBAP). The habitat preference of each species is then given together with an indication of status: C = common, U = uncommon and R = rare. The habitats are: Kavango and Kwando Rivers: O = open water, B = back swamps, oxbow lakes and floodplains, R = riparian woodland/forest; and Woodland savanna: M = omiramba with grassland and Acacia, W = deciduous short to tall woodland. Scientific and common names follow Maclean (1985).

Species	Survey						Habitat							
							Kavango River		Woodland savanna		Kwando River			
	a	b	c	d	e	f	O	B	R	M	W	O	B	R
Ostrich <i>Struthio camelus</i>	*	*			*	*						U	U	
Great Crested Grebe <i>Podiceps cristatus</i>						*								
Blacknecked Grebe <i>Podiceps nigricollis</i>					*									
Dabchick <i>Tachybaptus ruficollis</i>	*	*			*	*		C						C
White Pelican <i>Pelecanus onocrotalus</i>		*			*									R
Pinkbacked Pelican <i>Pelecanus rufescens</i>					*									
Whitebreasted Cormorant <i>Phalacrocorax carbo</i>	*	*			*	*	U	U						U
Reed Cormorant <i>Phalacrocorax africanus</i>	*	*	*		*	*	C	C						C
Darter <i>Anhinga melanogaster</i>	*	*	*		*	*	C	C						C
Grey Heron <i>Ardea cinerea</i>	*	*			*	*	U	U						U
Blackheaded Heron <i>Ardea melanocephala</i>	*	*			*	*			R					R
Goliath Heron <i>Ardea goliath</i>	*	*			*	*			U					U
Purple Heron <i>Ardea purpurea</i>	*	*	*	*	*	*			U					U
Great White Egret <i>Egretta alba</i>	*	*			*	*	U	U						U
Little Egret <i>Egretta garzetta</i>	*	*			*	*	C	C						C
Yellowbilled Egret <i>Egretta intermedia</i>	*	*			*	*			U					U
Black Egret <i>Egretta ardesiaca</i>	*	*			*	*			U					U
Slaty Egret <i>Egretta vinaceigula</i>	*	*			*	*			R					R
Cattle Egret <i>Bubulcus ibis</i>	*	*			*	*			C		U	R		C
Squacco Heron <i>Ardeola ralloides</i>	*	*	*	*	*	*			C					C
Greenbacked Heron <i>Butorides striatus</i>	*	*	*		*	*			U	C				U
Rufousbellied Heron <i>Butorides rufiventris</i>	*	*	*	*	*	*			C	C				U
Blackcrowned Night Heron <i>Nycticorax nycticorax</i>	*	*			*	*			C	C				U
Whitebacked Night Heron <i>Gorsachius leuconotus</i>					*	*								U
Little Bittern <i>Ixobrychus minutus</i>	*	*			*	*			U	U				U
Dwarf Bittern <i>Ixobrychus sturmii</i>	*	*			*	*			U	U				C
Hamerkop <i>Scopus umbretta</i>	*	*	*		*	*	C	C	C					C
White Stork <i>Ciconia ciconia</i>	*				*	*			R		R	R		R
Black Stork <i>Ciconia nigra</i>					*	*								
Abdi's Stork <i>Ciconia abdimii</i>	*	*			*	*			C		C	C		C
Woollynecked Stork <i>Ciconia episcopus</i>	*	*			*	*	C	C						U
Openbilled Stork <i>Anastomus lamelligerus</i>	*				*	*			C					C
Saddlebilled Stork <i>Ephippiorhynchus senegalensis</i>	*	*			*	*			U					U
Marabout Stork <i>Leptoptilos crumeniferus</i>	*	*	*		*	*	C	C			R	R		C
Yellowbilled Stork <i>Mycteria ibis</i>	*				*	*			U					U
Sacred Ibis <i>Threskiornis aethiopicus</i>	*				*	*			U	U				U
Glossy Ibis <i>Plegadis falcinellus</i>	*				*	*			C	C				C
Hadeda Ibis <i>Bostrychia hagedash</i>	*	*	*	*	*	*			C	C				C



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Species	Survey						Habitat							
							Kavango River		Woodland savanna		Kwando River			
	a	b	c	d	e	f	O	B	R	M	W	O	B	R
African Spoonbill		*						U					U	
Greater Flamingo						*								
Whitefaced Duck		*						U					U	
Fulvous Duck		*						R					U	
Whitebacked Duck						*								
Egyptian Goose		*						C	C			U	U	
Yellowbilled Duck		*						R	R			U	U	
Cape Teal						*								
Hottentot Teal		*						U					U	
Redbilled Teal		*						C				C		
Cape Shoveller		*						U				R		
Southern Pochard						*								
Pygmy Goose		*	*	*				C				C		
Knobbilled Duck		*						C	C			C	C	
Spurwinged Goose		*	*	*				C	C			U	U	
Maccoa Duck		*						R				R		
Secretarybird		*	*	*	*					U	U			
Hooded Vulture		*	*	*	*			R	R	R		R		
Whitebacked Vulture		*	*	*	*			C	C	C		C		
Lappetfaced Vulture		*	*	*	*					U	U			
Whiteheaded Vulture		*	*	*	*					U	U			
Yellowbilled Kite		*	*	*	*			C	C	C	C	C	C	
Black Kite		*	*	*	*			C	C	C	C	C	C	
Blackshouldered Kite		*	*	*	*			U	U	U	U	U		
Cuckoo Hawk		*						R	R					
Bat Hawk						*								
Honey Buzzard						*								
Tawny Eagle		*	*	*	*					U	U			
Steppe Eagle		*			*			U	U	U	U	U	U	
Lesser Spotted Eagle		*			*			U	U	U	U	U	U	
Wahlberg's Eagle		*	*	*	*			C	C	C		C		
Booted Eagle		*			*									
African Hawk Eagle		*	*	*	*			U	U	U		U		
Ayres' Eagle		*			*			R				R		
Longcrested Eagle		*	*	*	*			U	U	U		U	U	
Martial Eagle		*	*	*	*			U	U	U		U	U	
Brown Snake Eagle		*	*	*	*			U	U	U		U	U	
Blackbreasted Snake Eagle		*	*	*	*			U	U			U		
Western Banded Snake Eagle		*	*	*	*			U				U		
Bateleur		*	*	*	*			C	C	C		U	U	U
African Fish Eagle		*	*	*	*			C	C			U	U	U
Steppe Buzzard		*			*			U	U	U		U	U	
Lizard Buzzard		*	*	*	*			U	U			U	U	
Ovambo Sparrowhawk		*	*	*	*			U	U	U		U	U	
Little Sparrowhawk		*	*	*	*			U	U	U		U	U	
Black Sparrowhawk		*	*	*	*			U	U	U		U	U	
Little Banded Goshawk		*	*	*	*			U	U	C		U	U	
African Goshawk		*	*	*	*			U	C	C		U	U	
Gabar Goshawk		*	*	*	*			U	C	C		U	U	
Pale Chanting Goshawk		*	*	*	*									

Species	Survey						Habitat							
							Kavango River		Woodland savanna		Kwando River			
	a	b	c	d	e	f	O	B	R	M	W	O	B	R
Dark Chanting Goshawk	*	*			*	*							U	
African Marsh Harrier	*	*	*		*	*		C					U	U
Gynogone	*	*			*	*			U	U	U		U	U
Osprey					*	*								
Peregrine Falcon					*	*								
Lanner Falcon		*			*	*			R	R	R		R	R
Hobby Falcon		*			*	*			U	U	U		U	U
African Hobby Falcon					*	*								
Rednecked Falco					*	*								
Western Redfooted Kestrel		*			*	*		C		C	C		C	C
Eastern Redfooted Kestrel					*	*								
Rock Kestrel					*	*								
Greater Kestrel					*	*								
Lesser Kestrel					*	*								
Dickinson's Kestrel	*	*	*	*	*	*			U		U		U	U
Coqui Francolin	*	*	*	*	*	*						C		
Crested Francolin	*	*	*	*	*	*			C	C			C	C
Redbilled Francolin	*	*	*	*	*	*			C	C			C	C
Swainson's Francolin	*	*	*	*	*	*			C	C	C		C	C
Common Quail	*	*	*	*	*	*			U		U			
Halequin Quail	*	*	*	*	*	*			C	C				
Helmeted Guineafowl	*	*	*	*	*	*			C	U			C	C
Crested Guineafowl					*	*								
Kurrichane Buttonquail					*	*								
Wattled Crane		*	*	*	*	*			U				U	U
African Rail		*	*	*	*	*								
African Crane	*	*	*	*	*	*			U				U	U
Black Crane	*	*	*	*	*	*			C				C	C
Spotted Crane					*	*								
Baillon's Crane	*	*	*	*	*	*			R				R	R
Redchested Flufftail	*	*	*	*	*	*			U				U	U
Purple Gallinule	*	*	*	*	*	*			C				C	C
Lesser Gallinule					*	*								
Moorhen	*	*	*	*	*	*			C				C	C
Lesser Moorhen	*	*	*	*	*	*			C				C	C
Redknobbed Coot					*	*								
African Finfoot					*	*								
Kori Bustard					*	*								
Redcrested Korhaan	*	*	*	*	*	*					C	C		
Blackbellied Korhaan	*	*	*	*	*	*						U		
African Jacana	*	*	*	*	*	*			C				C	C
Lesser Jacana	*	*	*	*	*	*							U	U
Painted Snipe					*	*								
Ringed Plover					*	*								
Whitefronted Plover					*	*								
Kittlitz's Plover		*	*	*	*	*					U			
Threebanded Plover	*	*	*	*	*	*			C	C		C	C	C
Caspian Plover					*	*								
Crowned Plover	*	*	*	*	*	*							C	C
Blacksmith Plover	*	*	*	*	*	*			C	C			C	C

Species	Survey					Habitat						
	a	b	c	d	e	f	Kavango River		Woodland savanna		Kwando River	
							O	B	R	M	W	O
Whitecrowned Plover <i>Vanellus albiceps</i>					*	*						
Wattled Plover <i>Vanellus senegalensis</i>	*	*	*		*	*	U			U	U	
Longtoed Plover <i>Vanellus crassirostris</i>		*	*		*	*	U	C			U	U
Common Sandpiper <i>Tringa hypoleucos</i>	*	*	*		*	*	U	U	U		U	U
Wood Sandpiper <i>Tringa glareola</i>	*		*		*	*	C	C			C	
Marsh Sandpiper <i>Tringa stagnatilis</i>	*	*	*		*	*	U	U		U	U	
Greenshank <i>Tringa nebularia</i>	*	*			*	*	U	U	U		U	U
Curlew Sandpiper <i>Calidris ferruginea</i>					*	*						
Little Stint <i>Calidris minuta</i>	*				*	*	U	U	U		U	U
Sanderling <i>Calidris alba</i>					*	*						
Ruff <i>Philomachus pugnax</i>					*	*						
Ethiopian Snipe <i>Gallinago nigripennis</i>					*	*						
Avocet <i>Recurvirostra avocetta</i>					*	*						
Blackwinged Stilt <i>Himantopus himantopus</i>		*			*	*	C		C		C	
Spotted Dikkop <i>Burhinus capensis</i>	*	*			*	*			C	C		
Water Dikkop <i>Burhinus vermiculatus</i>	*	*	*	*	*	*		C			C	
Temminck's Courser <i>Cursorius temminckii</i>	*		*		*	*			U			
Threebanded Courser <i>Rhinoptilus cinctus</i>					*	*						
Bronzewinged Courser <i>Rhinoptilus chalcoterus</i>					*	*						
Redwinged Pratincole <i>Glareola pratincola</i>	*	*			*	*	U	U		U	U	
Blackwinged Pratincole <i>Glareola nordmanni</i>					*	*						
Rock Pratincole <i>Glareola nuchalis</i>	*	*			*	*	C					
Greyheaded Gull <i>Larus cirrocephalus</i>					*	*						
Whiskered Tern <i>Chlidonias hybridus</i>					*	*						
Whitewinged Tern <i>Chlidonias leucopterus</i>	*				*	*	C	C		U	U	
African Skimmer <i>Rhyacops flavirostris</i>	*	*			*	*	U	U				
Namaqua Sandgrouse <i>Pterocles namaqua</i>		*			*	*			R			
Burchell's Sandgrouse <i>Pterocles burchelli</i>	*	*	*		*	*			C			
Yellowthroated Sandgrouse <i>Pterocles gutturalis</i>	*				*	*	R		R		R	
Doublebanded Sandgrouse <i>Pterocles bicinctus</i>	*	*	*		*	*	C	C	C		C	
Redeyed Dove <i>Streptopelia semitorquata</i>	*	*	*		*	*	C				C	
Mourning Dove <i>Streptopelia decipiens</i>	*	*	*		*	*	C				C	
Cape Turtle Dove <i>Streptopelia capicola</i>	*	*	*		*	*	C	C	C		C	
Laughing Dove <i>Streptopelia senegalensis</i>	*	*			*	*	C	C	C		C	
Namaqua Dove <i>Oena capensis</i>	*	*	*		*	*	C	C	C		C	
Greenspotted Dove <i>Turtur chalcospilos</i>	*	*	*		*	*	C	C	C		C	
Green Pigeon <i>Treron calva</i>	*	*	*		*	*	C				C	
Cape Parrot <i>Poicephalus robustus</i>	*	*			*	*	R		R		R	
Meyer's Parrot <i>Poicephalus meyeri</i>	*	*	*		*	*	C	C	C		C	
Knysna Lourie <i>Tauraco corythaix</i>					*	*						
Grey Lourie <i>Corythaixoides concolor</i>	*	*	*		*	*	C	C	U		C	
European Cuckoo <i>Cuculus canorus</i>					*	*						
African Cuckoo <i>Cuculus gularis</i>					*	*	C	C	C		C	
Redchested Cuckoo <i>Cuculus solitarius</i>					*	*						
Black Cuckoo <i>Cuculus clamosus</i>					*	*	C	C	C		C	
Great Spotted Cuckoo <i>Clamator glandarius</i>					*	*						
Striped Cuckoo <i>Clamator leuallantii</i>					*	*						
Jacobin Cuckoo <i>Clamator jacobinus</i>	*				*	*	C	C	C		C	
Emerald Cuckoo <i>Chrysococcyx cupreus</i>					*	*						
Klass's Cuckoo <i>Chrysococcyx klaas</i>	*				*	*	C	C	C		C	

Species	Survey					Habitat							
	a	b	c	d	e	f	Kavango River		Woodland savanna		Kwando River		
							O	B	R	M	W	O	B
Diederik Cuckoo <i>Chrysococcyx caprius</i>	*	*			*	*	C	C	C	C		C	C
Black Coucal <i>Centropus bengalensis</i>					*	*							
Copperytailed Coucal <i>Centropus cupreicaudus</i>	*	*			*	*	C					C	
Senegal Coucal <i>Centropus senegalensis</i>	*	*			*	*	U					U	
Whitebrowed Coucal <i>Centropus superciliosus</i>	*	*			*	*	C					C	
Barn Owl <i>Tyto alba</i>	*	*			*	*			C	U	U		C
Wood Owl <i>Strix woodfordii</i>	*				*	*			U				U
Marsh Owl <i>Asio capensis</i>	*	*			*	*	U		U				U
Scops Owl <i>Otus senegalensis</i>	*	*	*		*	*			U	C	C		U
Whitefaced Owl <i>Otus leucotis</i>	*	*			*	*			U	C	C		U
Pearlspotted Owl <i>Glaucidium perlatum</i>	*	*			*	*			C	C	C		C
Barred Owl <i>Glaucidium capense</i>	*	*	*		*	*			C	U	U		C
Spotted Eagle Owl <i>Bubo africanus</i>	*				*	*			U	U	U		U
Giant Eagle Owl <i>Bubo lacteus</i>	*	*			*	*			U	U	U		U
Pel's Fishing Owl <i>Scotopelia peli</i>	*				*	*			R				R
European Nightjar <i>Caprimulgus europaeus</i>	*				*	*			R		R		R
Fierynecked Nightjar <i>Caprimulgus pectoralis</i>	*	*	*		*	*			C	C	C		C
Rufouscheeked Nightjar <i>Caprimulgus rufigena</i>	*	*	*		*	*			C	C	C		C
Natal Nightjar <i>Caprimulgus natalensis</i>					*	*							
Freckled Nightjar <i>Caprimulgus tristigma</i>	*	*			*	*			U				
Mozambique Nightjar <i>Caprimulgus fossii</i>	*	*			*	*			C	U	U		C
Pennantwinged Nightjar <i>Macrodipteryx vexillaria</i>					*	*							
European Swift <i>Apus apus</i>	*				*	*			C	C	C		C
Whiterumped Swift <i>Apus caffer</i>					*	*							
Horus Swift <i>Apus horus</i>					*	*							
Little Swift <i>Apus affinis</i>					*	*							
Palm Swift <i>Cypsiurus parvus</i>	*				*	*			U	U			U
Bohm's Spinetail <i>Meafrapus boehmi</i>					*	*							
Redfaced Mousebird <i>Colius indicus</i>	*				*	*			C	C	U		C
Narina Trogon <i>Apaloderma narina</i>	*	*			*	*			R				U
Pied Kingfisher <i>Ceryle rudis</i>	*	*	*		*	*			C	C			C
Giant Kingfisher <i>Ceryle maxima</i>	*	*	*		*	*			U	U			U
Halfcollared Kingfisher <i>Alcedo semitorquata</i>	*				*	*			R	R			R
Malachite Kingfisher <i>Alcedo cristata</i>	*	*	*		*	*			C	C			C
Pygmy Kingfisher <i>Ispidina picta</i>					*	*							
Woodland Kingfisher <i>Halcyon senegalensis</i>	*	*			*	*			C				C
Brownhooded Kingfisher <i>Halcyon albiventris</i>	*				*	*			U	U			U
Greyhooded Kingfisher <i>Halcyon leucocephala</i>	*	*			*	*			U	U	U		U
Striped Kingfisher <i>Halcyon chelicuti</i>	*	*	*		*	*			C	C	C		C
European Bee-eater <i>Merops apiaster</i>	*				*	*			C	C	C		C
Bluecheeked Bee-eater <i>Merops persicus</i>	*	*			*	*			C	C	C		C
Carmine Bee-eater <i>Merops nubicoides</i>	*	*	*		*	*			C				C
Whitefronted Bee-eater <i>Merops bullockoides</i>	*	*	*		*	*			C	C	C		C
Little Bee-eater <i>Merops pusillus</i>	*	*	*		*	*			C	C	C		C
Swallowtailed Bee-eater <i>Merops hirundineus</i>	*				*	*					C	U	
European Roller <i>Coracias garrulus</i>	*				*	*			U	U	U		U
Lilacbreasted Roller <i>Coracias caudata</i>	*	*	*		*	*			C	C	C		C
Rackettailed Roller <i>Coracias spatulata</i>	*	*	*		*	*			R				R
Purple Roller <i>Coracias naevia</i>	*	*	*		*	*			U	C	C		U

Species	Survey						Habitat							
							Kavango River		Woodland savanna		Kwando River			
	a	b	c	d	e	f	O	B	R	M	W	O	B	R
Broadbilled Roller <i>Eurystomus glaucurus</i>			*		*	*			U					U
African Hoopoe <i>Upupa epops</i>		*	*		*	*			U	C	C			U
Redbilled Woodhoopoe <i>Phoeniculus purpureus</i>	*	*	*		*	*			C	C	C			C
Scimitar-billed Woodhoopoe <i>Phoeniculus cyanomelas</i>	*	*	*		*	*			U	C	C			U
Trumpeter Hornbill <i>Bycanistes bucinator</i>					*									
Grey Hornbill <i>Tockus nasutus</i>	*	*	*		*	*			U	C	C			U
Redbilled Hornbill <i>Tockus erythrorhynchus</i>	*	*	*		*	*			U	C	U			U
Yellowbilled Hornbill <i>Tockus flavirostris</i>	*	*	*		*	*			U	C	U			U
Crowned Hornbill <i>Tockus alboterminatus</i>					*	*								
Bradfield's Hornbill <i>Tockus bradfieldi</i>	*	*	*		*	*			C	U	U			C
Ground Hornbill <i>Bucorvus leadbeateri</i>	*	*	*		*	*			R	U	U			R
Blackcollared Barbet <i>Lybius torquatus</i>	*	*	*		*	*			C					C
Pied Barbet <i>Lybius leucomelas</i>	*	*			*	*			C	C	C			C
Yellowfronted Tinker Barbet <i>Pogoniulus chrysoconus</i>	*		*		*	*			C	C	C			C
Crested Barbet <i>Trachyphonus vaillantii</i>	*	*			*	*			C		U			C
Greater Honeyguide <i>Indicator indicator</i>	*		*		*	*			U	U	U			U
Lesser Honeyguide <i>Indicator minor</i>	*				*	*			U		U			U
Sharpbilled Honeyguide <i>Prodotiscus regulus</i>	*				*	*			U		R			R
Slenderbilled Honeyguide <i>Prodotiscus zambesiae</i>					*	*			R		R			R
Bennett's Woodpecker <i>Campeothera bennettii</i>		*			*	*			C	C	C			C
Goldtailed Woodpecker <i>Campeothera abingoni</i>	*		*		*	*			C	C	C			C
Cardinal Woodpecker <i>Dendropicus fuscescens</i>	*	*	*		*	*			C	C	C			C
Bearded Woodpecker <i>Thripias nanaus</i>	*	*	*		*	*			C	C	C			C
Olive Woodpecker <i>Mesopicus griseocephalus</i>					*	*								
African Broadbill <i>Smithornis capensis</i>					*	*								
Monotonous Lark <i>Mirafra passerina</i>	*				*	*				U	U			
Rufous-naped Lark <i>Mirafra africana</i>	*	*			*	*				C	C			
Clapper Lark <i>Mirafra apiata</i>	*	*			*	*				R	R			
Flappet Lark <i>Mirafra rufocinnamomea</i>	*	*			*	*				C	C			
Fawn-coloured Lark <i>Mirafra africanoides</i>	*				*	*				C	C			
Sabota Lark <i>Mirafra sabota</i>					*	*								
Dusky Lark <i>Pinarocorys nigricans</i>					*	*								
Red-capped Lark <i>Calandrella cinerea</i>					*	*								
Chestnut-backed Finchlark <i>Eremopterix leucotis</i>					*	*								
Grey-backed Finchlark <i>Eremopterix verticalis</i>					*	*								
European Swallow <i>Hirundo rustica</i>	*	*			*	*			C	C		C	C	
Angola Swallow <i>Hirundo angolensis</i>					*	*								
Whitethroated Swallow <i>Hirundo albigularis</i>	*				*	*			R			R		
Wire-tailed Swallow <i>Hirundo smithii</i>	*	*			*	*			C	C		C	C	
Pearl-breasted Swallow <i>Hirundo dimidiata</i>	*				*	*			U			U		
Red-breasted Swallow <i>Hirundo senegalensis</i>	*	*			*	*			U		C	U		U
Mosque Swallow <i>Hirundo senegalensis</i>	*	*			*	*			C	C	C			C
Greater Striped Swallow <i>Hirundo cucullata</i>	*				*	*			U			U		
Lesser Striped Swallow <i>Hirundo abyssinica</i>	*	*			*	*			C	C		C	C	
South African Cliff Swallow <i>Hirundo spodiopoda</i>	*				*	*			U		U			U
Rock Martin <i>Hirundo fuligula</i>					*	*								
House Martin <i>Delichon urbica</i>	*				*	*			C		C	U		C
Grey-rumped Swallow <i>Pseudhirundo griseopygia</i>	*	*	*	*	*	*			C					C
Sand Martin <i>Riparia riparia</i>					*	*								
Brown-throated Martin <i>Riparia paludicola</i>	*	*			*	*			C	C		C	C	

Species	Survey						Habitat									
							Kavango River		Woodland savanna		Kwando River					
	a	b	c	d	e	f	O	B	R	M	W	O	B	R		
Banded Martin <i>Riparia cincta</i>	*				*	*			C	C				C	C	
Black Sawing Swallow <i>Psilidoprocne holomelas</i>					*	*										
Black Cuckooshrike <i>Campephaga flava</i>	*	*			*	*			C		C	C			C	
White-breasted Cuckooshrike <i>Coracina pectoralis</i>	*	*			*	*			U		U				U	
Fork-tailed Drongo <i>Dicrurus adsimilis</i>	*	*	*		*	*			C		C	C			C	
European Golden Oriole <i>Oriolus oriolus</i>	*				*	*			U		U				U	
African Golden Oriole <i>Oriolus auratus</i>	*	*	*		*	*			C		C	C			C	
Black-headed Oriole <i>Oriolus larvatus</i>		*	*		*	*			U		U				U	
Black Crow <i>Corvus capensis</i>	*				*	*							R			
Pied Crow <i>Corvus albus</i>					*	*										
Ashy Tit <i>Parus cinerascens</i>					*	*										
Southern Black Tit <i>Parus niger</i>	*	*	*		*	*			C		C	C			C	
Rufous-bellied Tit <i>Parus rufiventris</i>	*	*			*	*							U			
Cape Penduline Tit <i>Anthoscopus minutus</i>					*	*										
Grey Penduline Tit <i>Anthoscopus caroli</i>	*	*			*	*							U			
Arrow-marked Babbler <i>Turdoides jardineii</i>	*	*	*	*	*	*			C		U				C	
Black-faced Babbler <i>Turdoides melanops</i>					*	*										
Whiterumped Babbler <i>Turdoides leucopygius</i>	*	*	*	*	*	*			C	C					C	C
Pied Babbler <i>Turdoides bicolor</i>					*	*										
Red-eyed Bulbul <i>Pycnonotus nigricans</i>	*				*	*							C	U		
Black-eyed Bulbul <i>Pycnonotus barbatus</i>	*	*	*		*	*			C							C
Terrestrial Bulbul <i>Phyllastrephus terrestris</i>	*	*			*	*			C							C
Yellowbellied Bulbul <i>Chlorocichla flaviventris</i>	*	*			*	*			C							C
Kurri-chane Thrush <i>Turdus libonyana</i>	*	*	*		*	*			U		U					U
Groundscraper Thrush <i>Turdus litsitsirupa</i>	*	*	*		*	*							C	C		
Capped Wheatear <i>Oenanthe pileata</i>					*	*										
Arnot's Chat <i>Thaenolaea arnoti</i>	*	*	*		*	*			C		U					C
Ant-eating Chat <i>Myræocichla formicivora</i>					*	*										
Stonechat <i>Saxicola torquata</i>	*	*	*	*	*	*			C							C
Heuglin's Robin <i>Cossypha heuglini</i>	*	*			*	*							C			C
Natal Robin <i>Cossypha natalensis</i>					*	*										
Thrush Nightingale <i>Luscinia luscinia</i>					*	*										
White-browed Robin <i>Erythropygia leucophrys</i>	*	*	*		*	*			C		C					C
Kalahari Robin <i>Erythropygia daena</i>	*				*	*							C	U		
Bearded Robin <i>Erythropygia quadrivirgata</i>	*	*			*	*			U							R
Garden Warbler <i>Sylvia borin</i>					*	*										
Whitethroat <i>Sylvia communis</i>	*				*	*					R	C	U			R
Tit-babbler <i>Parisoma subcaeruleum</i>	*	*			*	*			U		C	U				U
Icterine Warbler <i>Hippolais icterina</i>	*				*	*			C		C	C				C
Great Reed Warbler <i>Acrocephalus arundinaceus</i>					*	*										
African Marsh Warbler <i>Acrocephalus baeticatus</i>	*				*	*			C							C
European Marsh Warbler <i>Acrocephalus palustris</i>					*	*										
European Marsh Warbler <i>Acrocephalus schoenobaenus</i>					*	*										
Cape Reed Warbler <i>Acrocephalus gracillirostris</i>	*				*	*			C							C
Greater Swamp Warbler <i>Acrocephalus rufescens</i>	*				*	*			C							C
African Sedge Warbler <i>Bradypterus baboecala</i>	*	*			*	*			C							C
Willow Warbler <i>Phylloscopus trochilus</i>	*	*	*		*	*			C		C	C				C
Yellow-breasted Apalis <i>Apalis flavidia</i>					*	*										
Long-billed Crombec <i>Sylvietta rufescens</i>	*	*	*		*	*			C		C	C				C
Yellowbellied Eremomela <i>Eremomela icteropygialis</i>	*				*	*			U		C	U				C

Species	Survey					Habitat						
						Kavango River		Woodland savanna		Kwando River		
	a	b	c	d	e	D	B	R	M	W	D	B
Greencapped Eremomela <i>Eremomela scotops</i>	*				*			R		U		R
Burntnecked Eremomela <i>Eremomela usticollis</i>	*				*			U	U	U		U
Bleating Warbler <i>Cameroptera brachyura</i>	*	*	*		*			C	C	U		C
Barred Warbler <i>Cameroptera fasciolata</i>	*				*			C	C			C
Stierling's Barred Warbler <i>Cameroptera stierlingi</i>	*				*			C				C
Fantailed Cisticola <i>Cisticola juncidis</i>	*				*			C		C		
Desert Cisticola <i>Cisticola aridula</i>	*				*							
Tinkling Cisticola <i>Cisticola rufilata</i>	*	*			*			C	C			
Rattling Cisticola <i>Cisticola chiniana</i>	*	*			*			C	C			
Redfaced Cisticola <i>Cisticola erythroops</i>	*	*			*			U				U
Blackbacked Cisticola <i>Cisticola galactotes</i>	*	*			*			U				U
Chirping Cisticola <i>Cisticola pipliens</i>	*	*	*		*			C				C
Neddicky Cisticola <i>Cisticola fulvicapilla</i>	*				*			U	R	U		U
Tawnyflanked Prinia <i>Prinia subflava</i>	*	*	*		*			C	C			C
Blackchested Prinia <i>Prinia flavicans</i>	*	*			*			C	C			C
Spotted Flycatcher <i>Muscicapa striata</i>	*	*			*			C	C	C		C
Bluegrey Flycatcher <i>Muscicapa caeruleascens</i>	*				*							
Fantailed Flycatcher <i>Myiophobus plumbeus</i>				*	*			U				U
Black Flycatcher <i>Melaenornis pammelaia</i>			*		*			U	R	U		U
Marico Flycatcher <i>Melaenornis mariguensis</i>	*	*			*			U	U	U		U
Pallid Flycatcher <i>Melaenornis pallidus</i>	*	*			*			U	C			U
Chinspot Batis <i>Batis molitor</i>	*	*	*		*			U	U	U		U
Paradise Flycatcher <i>Terpsiphona viridis</i>	*	*	*	*	*			C	C	U		C
African Pied Wagtail <i>Motacilla alpestris</i>	*	*	*		*			C	C			C
Cape Wagtail <i>Motacilla capensis</i>	*	*			*			C				C
Yellow Wagtail <i>Motacilla flava</i>	*				*							
Richard's Pipit <i>Anthus novaeseelandiae</i>	*				*			C	C			C
Wood Pipit <i>Anthus nyassae</i>	*				*			U	U	U		U
Plainbacked Pipit <i>Anthus leucophrys</i>	*				*			C	U			C
Buffy Pipit <i>Anthus vaalensis</i>	*				*							
Tree Pipit <i>Anthus trivialis</i>	*				*							
Pinkthroated Longclaw <i>Macronyx ameliae</i>	*				*							
Lesser Grey Shrike <i>Lanius minor</i>	*	*			*			U	C	C	U	U
Fiscal Shrike <i>Lanius collaris</i>	*				*			R	R			R
Redbacked Shrike <i>Lanius collurio</i>	*	*			*			C	C	C		C
Sousa's Shrike <i>Lanius souzai</i>	*				*							
Longtailed Shrike <i>Corvinella melanoleuca</i>	*	*			*			C	C	C		C
Tropical Boubou <i>Laniarius aethiopicus</i>	*				*							U
Swamp Boubou <i>Laniarius bicolor</i>	*	*	*		*			C	C			C
Crimsonbreasted Shrike <i>Laniarius atrococcineus</i>	*	*	*		*			C	C			C
Puffback <i>Dryoscopus cuba</i>	*	*	*		*			U	U	U		U
Brubru <i>Nilaus afer</i>	*	*			*			U	U	U		U
Threestreaked Tchagra <i>Ichagra australis</i>	*	*			*			C	C	C		C
Blackcrowned Tchagra <i>Ichagra senegala</i>	*	*	*		*			C	C	C		C
Orangebreasted Bush Shrike <i>Telophorus sulfurepectus</i>	*	*	*		*			C				C
Greyheaded Bush Shrike <i>Malaconotus blanchoti</i>	*				*							
White Helmetshrike <i>Prionops plumatus</i>	*	*	*		*			C	U	C		C
Redbilled Helmetshrike <i>Prionops retzii</i>	*				*			U		U		U
Whitethroated Shrike <i>Eurocephalus anguiformis</i>	*	*			*			U	C	U		U
Wattled Starling <i>Creatophora cinerea</i>	*				*			C	C	C	C	C

Species	Survey					Habitat						
						Kavango River		Woodland savanna		Kwando River		
	a	b	c	d	e	D	B	R	M	W	D	B
Plumcoloured Starling <i>Cinnyricinclus leucogaster</i>	*	*	*		*			U	U	U		U
Burchell's Starling <i>Lamprolornis australis</i>	*	*			*			C	C	U		C
Longtailed Starling <i>Lamprolornis nevesii</i>	*	*	*		*			C				C
Glossy Starling <i>Lamprolornis nitens</i>	*	*			*			R	C	C		R
Greater Blue-eared Starling <i>Lamprolornis chalybaeus</i>	*	*			*			C	U	U		C
Lesser Blue-eared Starling <i>Lamprolornis chloropterus</i>	*				*							U
Sharptailed Starling <i>Lamprolornis acuticaudus</i>	*	*			*							C
Yellowbilled Oxpecker <i>Buphagus africanus</i>	*		*		*			C	C	U	U	C
Redbilled Oxpecker <i>Buphagus erythrorhynchus</i>	*	*			*			C	C	U	U	C
Coppery Sunbird <i>Nectarinia cupea</i>	*				*							
Marico Sunbird <i>Nectarinia mariguensis</i>	*	*	*		*			C	C	U		C
Purplebanded Sunbird <i>Nectarinia bifasciata</i>	*				*							
Whitebellied Sunbird <i>Nectarinia talatala</i>	*	*	*		*			C	C	C		C
Scarletchested Sunbird <i>Nectarinia senegalensis</i>	*	*			*			U	U			U
Black Sunbird <i>Nectarinia amethystina</i>	*		*		*				U	U		
Collared Sunbird <i>Anthreptes collaris</i>	*				*				U			U
Yellow White-eye <i>Zosterornis senegalensis</i>	*	*	*		*				U			U
Redbilled Buffalo Weaver <i>Bubalornis niger</i>	*				*				U	U		
Whitebrowed Sparrowweaver <i>Ploceopasser mahali</i>	*				*				U	U	U	U
Great Sparrow <i>Passer otitensis</i>	*				*							
House Sparrow <i>Passer domesticus</i>	*				*							
Greyheaded Sparrow <i>Passer griseus</i>	*		*		*			C	C	C		C
Yellowthroated Sparrow <i>Petronia superciliaris</i>	*	*	*		*			C	U	C		C
Scalyfeathered Finch <i>Sporopipes squamifrons</i>	*				*			U		U		U
Thickbilled Weaver <i>Amblyospiza albifrons</i>	*				*			U				C
Spectacled Weaver <i>Ploceus ocularis</i>	*				*							
Spottedbacked Weaver <i>Ploceus cucullatus</i>	*				*			C	C			C
Masked Weaver <i>Ploceus velatus</i>	*	*	*		*			C	C	C		C
Lesser Masked Weaver <i>Ploceus intermedius</i>	*				*			U	U	U		U
Golden Weaver <i>Ploceus xanthops</i>	*				*							
Brownthroated Weaver <i>Ploceus xanthopterus</i>	*	*			*			U	U			U
Redheaded Weaver <i>Anaplectes rubriceps</i>	*	*			*				U	U		
Cuckoo Finch <i>Anomalospiza imberbis</i>	*				*							
Redbilled Quelea <i>Quelea quelea</i>	*		*		*			C	C	C	C	C
Red Bishop <i>Euplectes orix</i>	*				*			U				C
Golden Bishop <i>Euplectes afer</i>	*	*			*			U				U
Redshouldered Widow <i>Euplectes axillaris</i>	*	*	*		*			U				U
Whitewinged Widow <i>Euplectes albonotatus</i>	*				*							
Goldenbacked Pytilia <i>Pytilia afro</i>	*				*							
Melba Finch <i>Pytilia melba</i>	*	*			*			C	C	U		C
Redthroated Twinspot <i>Hypargos niveoguttatus</i>	*				*			R				
Jameson's Firefinch <i>Lagonosticta rhodopareia</i>	*		*		*			U	U			U
Redbilled Firefinch <i>Lagonosticta senegala</i>	*	*			*			U	U			U
Brown Firefinch <i>Lagonosticta nitidula</i>	*	*			*			U	U			U
Blue Waxbill <i>Uraeginthus angolensis</i>	*	*	*		*			C	C	U		C
Violeteared Waxbill <i>Uraeginthus granatinus</i>	*	*			*			C	C	U		C
Common Waxbill <i>Estrilda astrild</i>	*	*			*			C	C			C
Blackcheeked Waxbill <i>Estrilda erythronotos</i>	*				*			U	C	U		U
Quail Finch <i>Dryogosiza atricollis</i>	*				*			U		U		U
Orangebreasted Waxbill <i>Sporaeiginthus subflavus</i>	*				*			R				R



Species	Survey						Habitat					
	a	b	c	d	e	f	Kavango River		Woodland savanna		Kwando River	
							O	B	R	M	W	O
Cutthroat Finch <i>Amadina fasciata</i>					*	*						
Redheaded Finch <i>Amadina erythrocephala</i>					*							
Bronze Mannikin <i>Spernaestres cucullatus</i>					*							
Pintailed Whydah <i>Vidua macvoura</i>	*	*			*	*	U	U			U	U
Shafttailed Whydah <i>Vidua regia</i>	*	*			*	*	C		C	U		C
Paradise Whydah <i>Vidua paradisea</i>	*				*	*	C	C	C	U		C
Broadtailed Paradise Whydah <i>Vidua obtusa</i>					*							
Purple Widowfinch <i>Vidua purpurascens</i>					*	*						
Steelblue Widowfinch <i>Vidua chalybeata</i>					*	*						
Yelloweyed Canary <i>Serinus mozambicus</i>	*	*	*		*	*	C	C	C			C
Blackthroated Canary <i>Serinus atrogularis</i>	*				*	*		R		U		R
Goldenbreasted Bunting <i>Emberiza flaviventris</i>	*	*			*	*			C	C		

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TABLE 2

The conservation status of birds in the West Caprivi Strip relative to their habitat preferences. "Endangered" = species in danger of extinction in Namibia if the causal factors continue to operate; "Vulnerable" = species believed likely to move into the endangered category in the near future if the causal factors continue operating; "Rare" = species with small or localised populations; "Amber" = species requiring regular monitoring because of limited numbers, restricted distributions, specialized requirements or because insufficient information is currently available to class them in one of the other categories. The conservation status is taken from the Namibian Red Data Book for Birds (Williams & Brown in prep).

Habitat	Number of species	Conservation status						Red Data species	
		Endangered	Vulnerable	Rare	Amber	Not threatened	Number		
							Percent (%)		
Riparian woodland	24	1	3	5	4	11	13	54,2	
Wetlands	88	3	4	7	23	51	37	42,0	
Wetlands + riparian woodland	16	1	0	1	1	13	3	18,8	
All habitats	29	0	1	2	2	24	5	17,2	
Omirumba + deciduous woodland	25	0	1	2	1	21	4	16,0	
Deciduous woodland	9	0	0	1	0	8	1	11,1	
Wetlands + omirumba	20	0	0	0	2	18	2	10,0	
Riparian woodland + omirumba	10	0	0	1	0	9	1	10,0	
Riparian woodland + deciduous woodland	20	0	0	1	1	18	2	10,0	
Riparian + deciduous woodlands + omirumba	95	0	2	2	3	88	7	7,4	
Omirumba	3	0	0	0	0	3	0	0	

## RECORDS OF BIRDS OF THE CUNENE RIVER ESTUARY

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## INTRODUCTION

Although described as an 'estuary', the Cunene River mouth on the northern border of the Skeleton Coast Park, Namibia, cannot strictly be compared to estuaries elsewhere in southern Africa. The Cunene River mouth comprises a wetland delta system with tidal influences up to four kilometres upstream. The permanently open mouth leads into a lagoon about two kilometres wide by one kilometre long at high tide (Figure 1). Upstream from the lagoon, the river banks and a few islands are bordered by dense stands of reed Phragmites australis, providing suitable habitat for several species of birds. From about five kilometres upstream the river banks are covered with scattered Tamarix usneoides and Sueda plumosa scrub.

Elephants frequent the area and Nile Crocodiles, Monitors and Soft-shelled Turtles are commonly found in the river. Green Turtles have been encountered at the mouth and there appears to be an abundance of fish. Gemsbok, Springbok, Black-backed Jackal and Brown Hyena are common in the surrounding desert, and lions are also occasionally encountered.

Besides the Orange River on the southern border of Namibia, the Cunene River is the only other perennial river in Namibia which flows into the Atlantic Ocean. The Cunene River estuary is therefore an important wetland refuge for numerous migratory species, as well as many other species not commonly found in the region or elsewhere in Namibia.

Annotated lists of the birds of the Skeleton Coast Park have previously been presented (Ryan & Cooper 1984, Braine 1987, 1988). This paper specifically presents records of birds of the Cunene River estuary observed and caught during the period 1982 to 1988, and provides information on a number of previously unrecorded species.

## RESULTS

Regular patrols were undertaken to the Cunene River estuary from 1982 to 1988. Bird observations and counts were carried out and I recorded the maximum number of individuals of a species found at any one time (Table 1).

Bird ringing was first undertaken at this locality in 1984, and by the end of 1987 a total of 188 birds, comprising 27 species, had been ringed and released. Vernacular bird names and numbers follow Maclean (1985), and species reported by Ryan & Cooper (1984) but not recorded in this study are marked with an asterisk (\*). Pelagic bird species were not included in this report, unless observed on, or flying over, the lagoon and estuary.

## DISCUSSION

It is evident from this study that the Cunene River estuary, although relatively small, is an important wetland refuge for several migratory bird species (Table 1). Other species, such as the Royal Tern, possibly occur here at the edge of their range, since they have only rarely been recorded south of the Cunene (Maclean 1985). During December 1987 a group of some 2000 Damara Terns were observed at the Cunene mouth for seven days, and a further 600 Damara Terns were counted along the coast between Cape Fria and Cunene mouth. If the estimated world population of Damara Terns is roughly 3000 - 4000 individuals (Clinging 1978), then the Cunene River estuary can be said to support more than half of this world population for a certain length of time during the year.

The vast reedbeds and abundant fish resources offer habitat and food for many other wetland species such as Goliath, Purple and Whitebacked Night Heron and Reed Cormorants. These species do not normally occur as far west as this study has indicated. Another species, Olive Bee-eater, although observed fairly close to the coast in the Hoarusib River, is commonly observed in the Cunene River estuary.

## ACKNOWLEDGEMENTS

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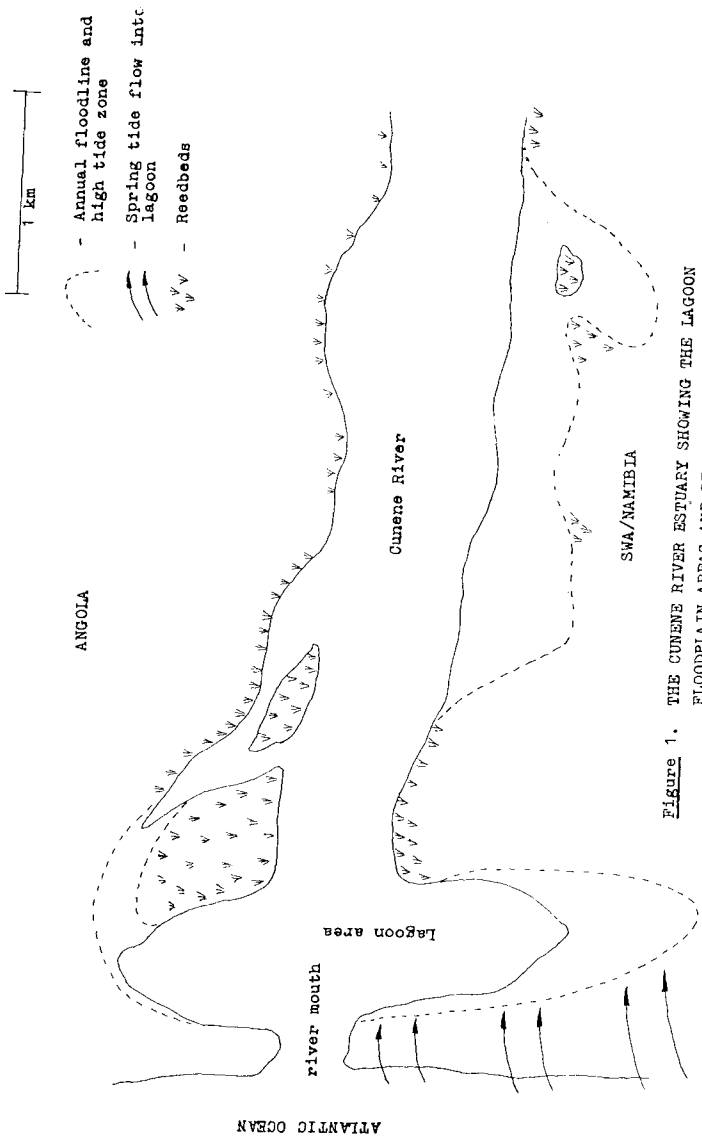


TABLE 1  
Bird species recorded at the Cunene River mouth, Skeleton Coast Park, Namibia. Species marked with an asterisk were recorded by Ryan *et al.* (1984), but not during this study.

Roberts Number	Species		Highest number of birds recorded at one time	Birds proven to breed	Residents possibly breed	Species ringed since 1984
	Common Name	Scientific Name				
1	Ostrich	<i>Struthio camelus</i>	6			
7*	Blacknecked Grebe	<i>Podiceps nigricollis</i>			X	
49	White Pelican	<i>Pelecanus oncorhynchus</i>	86			
53	Cape Gannet	<i>Morus capensis</i>	3			
55	Whitebreasted Cormorant	<i>Phalacrocorax carbo</i>	150 +	X		
56	Cape Cormorant	<i>P. capensis</i>	300 +			
58	Keed Cormorant	<i>P. africanus</i>	44	X		
60	Darter	<i>Anhinga melanogaster</i>	6			
62	Grey Heron	<i>Ardea cinerea</i>	5			
63	Blackheaded Heron	<i>A. melanoccephala</i>	1			
64	Goliath Heron	<i>A. goliath</i>	6			
65	Purple Heron	<i>A. purpurea</i>	1			
67	Little Egret	<i>Egretta garzetta</i>	11		X	
71	Cattle Egret	<i>Bubulcus ibis</i>	1		X	
77	Whiteback Night Heron	<i>Nycticorax nycticorax</i>	2			
81*	Hammerkop	<i>Scopus umbretta</i>			X	
83*	White Stork	<i>Ciconia ciconia</i>				
95	Abdim's Stork	<i>C. abdimii</i>	1			
96	African Spoonbill	<i>Platalea alba</i>	2			
97	Greater Flamingo	<i>Phoenicopterus ruber</i>	40 +			
102	Lesser Flamingo	<i>P. minor</i>	300 +			
106	Egyptian Goose	<i>Alopochen aegyptiaca</i>	12			
107*	Cape Teal	<i>Anas capensis</i>	44		X	
107*	Hottentot Teal	<i>A. hottentota</i>			X	
108*	Redbilled Teal	<i>A. erythrorhynchos</i>			X	
112*	Cape Shoveller	<i>A. smithii</i>				
148*	African Fish Eagle	<i>Haliaeetus vocifer</i>				
170	Osprey	<i>Pandion haliaetus</i>	4			
171	Peregrine Falcon	<i>Falco peregrinus calidus</i>	1		X	
173	Hobby Falcon	<i>F. p. minor</i>	2		X	
181	Rock Kestrel	<i>F. tinnunculus</i>	2		X	

Roberts Number	Species		Highest number of birds recorded at one time	Birds proven to breed	Residents possibly breed	Species ringed since 1984
	Common Name	Scientific Name				
200	Common Quail	<i>Coturnix coturnix</i>	1			
201	Harlequin Quail	<i>C. delegorguei</i>	1			
213	Black Crane	<i>Amaurornis flavirostris</i>	Plentiful	x		x
226	Moorhen	<i>Gallinula chloropus</i>	4			
228	Redknobbed Coot	<i>Fulica cristata</i>	6			
223	Purple Gallinule	<i>Porphyrio porphyrio</i>	4			
232	Ludwig's Bustard	<i>Neotis ludwigii</i>	1			
242	Painted Snipe	<i>Rostratula benghalensis</i>	10			
243	Ringed Plover	<i>Charadrius hiaticula</i>	3			
246	Whitefronted Plover	<i>C. marginatus</i>	160	x		x
247	Chestnutbanded Plover	<i>C. pallidus</i>	40			x
248	Kittlitz's Plover	<i>C. pecuarius</i>	6			x
249	Threebanded Plover	<i>C. tricollaris</i>	30 +			x
250	Mongolian Plover	<i>C. mongolus</i>	1			
254	Grey Plover	<i>Pluvialis squatarola</i>	40 +			
258	Blacksmith Plover	<i>Vanellus armatus</i>	2			
262	Turnstone	<i>Arenaria interpres</i>	60 +			
264	Common Sandpiper	<i>Tringa hypoleucos</i>	10 +			
269	Marsh Sandpiper	<i>T. stagnatilis</i>	4			
270	Greenshank	<i>T. nebularia</i>	80 +			
271	Knot	<i>Calidris canutus</i>	60 +			
272	Curlew Sandpiper	<i>C. ferruginea</i>	600 +			x
274	Little Stint	<i>C. minuta</i>	300 +			x
281	Sanderling	<i>C. alba</i>	800 +			x
284	Ruff	<i>Philomachus pugnax</i>	80			
288	Battailed Godwit	<i>Limosa lapponica</i>	40			
289	Curlew	<i>Numenius arquata</i>	1			
294	Whimbrel	<i>A. phaeopus</i>	3			
294	Avocet	<i>Recurvirostra avosetta</i>	60			
295	Blackwinged Stilt	<i>Himantopus himantopus</i>	2			
298	Water Dikkop	<i>Burhinus vermiculatus</i>	3			
307	Arctic Skua	<i>Stercorarius parasiticus</i>	3			
309	Pomarine Skua	<i>Stercorarius pomarinus</i>	1			
312	Keip Gull	<i>Larus dominicanus</i>	Plentiful			
315	Greyheaded Gull	<i>L. cirrocephalus</i>	Plentiful			
316	Hartaub's Gull	<i>L. hartaubii</i>	4			x

Roberts Number	Species		Highest number of birds recorded at one time	Birds proven to breed	Residents possibly breed	Species ringed since 1984
	Common Name	Scientific Name				
322	Caspian Tern	<i>Hydroprogne caspia</i>	36			
323	Royal Tern	<i>Sterna maxima</i>	2			
324	Swift Tern	<i>S. bergii</i>	4			
326	Sandwitch Tern	<i>S. sandvicensis</i>	100 +			
327	Common Tern	<i>S. hirundo</i>	1000 +			
328	Arctic Tern	<i>S. paradisaea</i>	1 mortality			
334	Damara Tern	<i>S. balaenarum</i>	2000	x		
337	Black Tern	<i>Chlidonias niger</i>	20 +			
339	Whitewinged Tern	<i>C. leucopterus</i>	12			
349	Rock Pigeon	<i>Columba guinea</i>	Plentiful	x		
354	Cape Turtle Dove	<i>Streptopelia capicola</i>	Plentiful	x		
355	Laughing Dove	<i>S. senegalensis</i>	Plentiful	x		
395	Marsh Owl	<i>Asio capensis</i>	2			
428	Pied Kingfisher	<i>Ceryle rudis</i>	Plentiful	x		x
429	Giant Kingfisher	<i>C. maxima</i>	4			
439	Olive Bee-Eater	<i>Merops superciliosus</i>	8			
518	Europea Swallow	<i>Hirundo rustica</i>	Plentiful			x
520	Whitethroated Swallow	<i>H. albigularis</i>	2			
522	Wiretailed Swallow	<i>H. smithii</i>	2			
529	Rock Martin	<i>Hirundo fuligula</i>		x		
533	Brownthroated Martin	<i>Riparia paludicola</i>	Plentiful			
532*	Sand Martin	<i>Riparia riparia</i>	Plentiful			
547	Black Crow	<i>Corvus capensis</i>	2			
548	Piep Crow	<i>C. albus</i>	12 +			
567	Redeyed Bulbul	<i>Pycnonotus nigricans</i>	Plentiful	x		x
586	Mountain Chat	<i>Oenanthe monticola</i>	Common	x		
589	Familiar Chat	<i>Cercomela familiaris</i>	Common	x		
590	Tractrac Chat	<i>C. tractrac</i>	Common			
631	African Marsh Warbler	<i>Acrocephalus baeticatus</i>	Common	x		x
635	Cape Reed Warbler	<i>A. gracillirostris</i>	Common	x		x
664	Fantailed Cisticola	<i>Cisticola juncidis</i>	Common	x		
665	Desert Cisticola	<i>C. aridula</i>	Common	x		
685	Blackchested Prinia	<i>Prinia flavicans</i>	Common			x
689	Spotted Flycatcher	<i>Muscicapa striata</i>	2	x		x
711	African Pied Wagtail	<i>Motacilla aguimp</i>	Common			x
713	Cape Wagtail	<i>M. capensis</i>	Common	x		x

Roberts Number	Species		Highest number of birds recorded at one time	Birds proven to breed	Residents possibly breed	Species ringed since 1984
	Common Name	Scientific Name				
716	Richard's Pipit	<i>Anthus novaeseelandiae</i>	1			
732	Fiscal Shrike	<i>Lanius collaris</i>	Common		x	
788	Dusky Sunbird	<i>Nectarinia fusca</i>	Common		x	
803	Cape Sparrow	<i>Passer melanurus</i>	Common	x		
810*	Spectacled Weaver	<i>Ploceus oculorisor</i>				
814	Masked Weaver	<i>P. velatus</i>	Common	x		x
815	Lesser Masked Weaver	<i>P. intermedius</i>	Not Common	x		
816	Golden Weaver	<i>P. xanthops</i>	Not Common	x		x
846	Common Waxbill	<i>Estrilda astrild</i>	Common		x	

SEXING CHESTNUT WEAVERS Ploceus rubiginosus

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## INTRODUCTION

The Chestnut Weaver Ploceus rubiginosus is considered to be uncommon and localised in southwestern Africa, with seasonally erratic fluctuations in numbers and poorly understood dispersal during periods of non-breeding (Braine & Braine 1971, Maclean 1985, Berry *et al.* 1987). When adults are in eclipse plumage, it is virtually impossible to determine the sex and age of individuals in the field. This problem is compounded by a dearth of published morphometric information (Maclean 1985, Komen in press). Many species of otherwise monomorphic birds show some degree of sexual size dimorphism and appropriate body measurements may be used to determine the sex of individuals. I have shown elsewhere that Chestnut Weavers can be accurately sexed, using relatively complicated discriminant analysis of body measurements (Komen in press). This method requires access to a calculator, an item which is rarely found in a ringer's box of tricks, so it is useful to provide an alternative, simple and convenient, method of determining sex of Chestnut Weavers in the hand.

## METHODS

Forty-six Chestnut Weavers were measured during ringing operations on Otjongoro Farm near Omaruru in 1985 (20° 53' S, 15° 38' E) and near Tsumkwe, Bushmanland, Namibia (19° 37' S, 20° 27' E) in 1986. All other specimens were study skins (n = 188) and anatomical specimens (n = 26) from the collection of the State Museum of Namibia.

Body mass of live-caught individuals was measured with a 50 g Pesola balance, to the nearest gram. Amongst other body measurements, standard wing-length (distance between the carpal joint of the bent wing to the tip of the longest primary) and tail-length (from insertion to tip of longest rectrix) were measured with a steel rule. All measurements made with the steel rule were taken to the nearest 0.5 mm.

Of the 260 specimens and live birds measured, 45 were sexed by obvious nuptial plumage and 26 were sexed by

dissection. For the purpose of this note, the method of Green & Theobald (1989) is used to provide a graph of wing- and tail-length, with probability contours corresponding to specified probabilities that any measured bird is male. Using this method, ringers may allocate a sex to a measured bird with some measured degree of confidence.

Table 1: Body measurements of Chestnut Weavers according to known sex (males: n = 42; females: n = 29).

Body measurement		mean	± SD	$t^1$	P
Bill-chord (mm)	Male	20.93	0.76	7.86	<0.001
	Female	19.57	0.69		
Bill-width (mm)	Male	8.47	0.31	2.98	<0.01
	Female	8.20	0.42		
Bill-height (mm)	Male	10.89	0.45	5.99	<0.001
	Female	10.28	0.40		
Skull-length (mm)	Male	36.31	1.27	6.76	<0.001
	Female	34.40	1.10		
Wing-length (mm)	Male	83.68	1.50	18.71	<0.001
	Female	77.52	1.26		
Tail-length (mm)	Male	52.41	1.81	13.33	<0.001
	Female	47.35	1.39		
Tarsus	Male	22.86	0.89	7.61	<0.001
	Female	21.43	0.69		

$t^1$  Unpaired  $t$ -test.

## RESULTS AND DISCUSSION

Body measurements of Chestnut Weavers of known sex are shown in Table 1. The frequency distributions of body measurements of all birds measured, and for known males and females are illustrated in Figure 1. The underlying

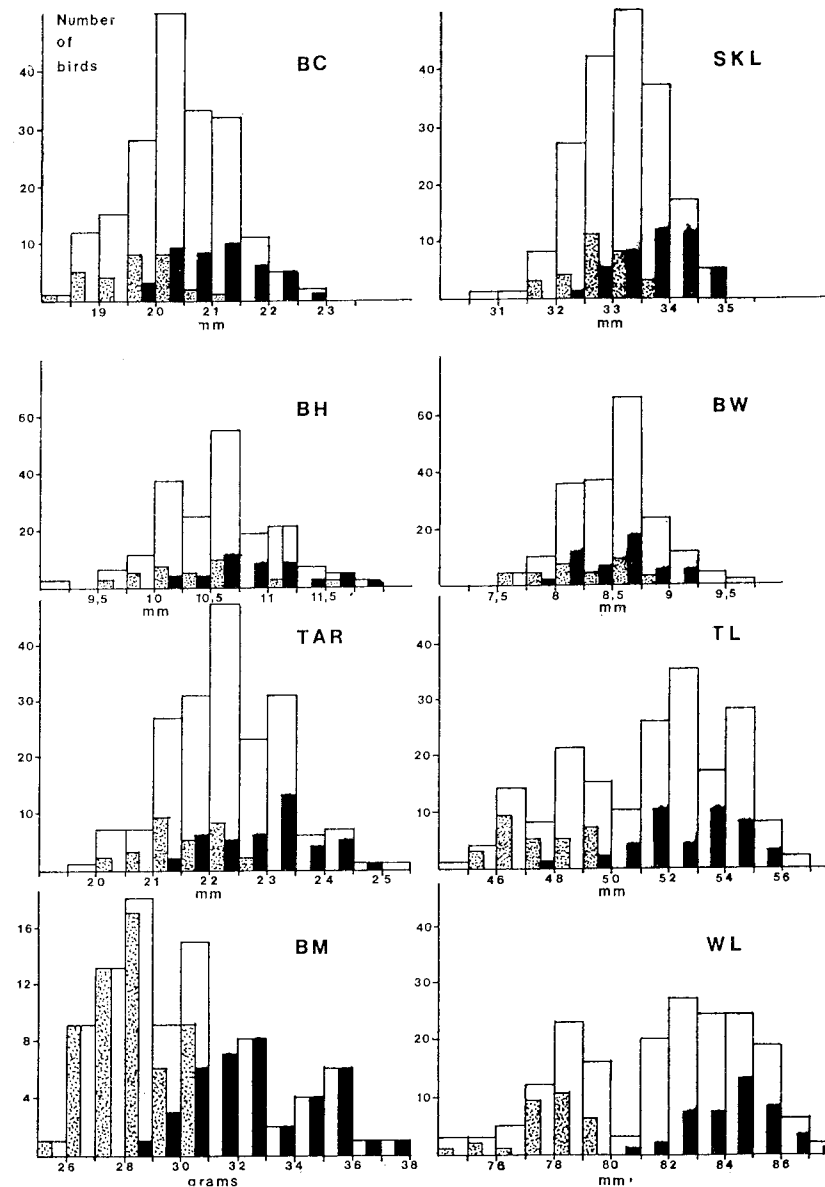


Figure 1: The frequency distributions of body measurements of Chestnut Weavers (BC = bill-chord, SKL = skull-length, BH = bill-height, BW = bill-width, TAR = tarsus, TL = tail-length, BM = body mass, WL = wing-length). Clear bars are all unsexed birds (n = 189), black bars are known males (n = 42) and grey bars are known females (n = 29). The frequency distribution of body mass is based on live-captured birds and anatomical specimens weighed at capture (n = 94; this study and unpublished data) and classified to correct sex retrospectively using discriminant analysis.

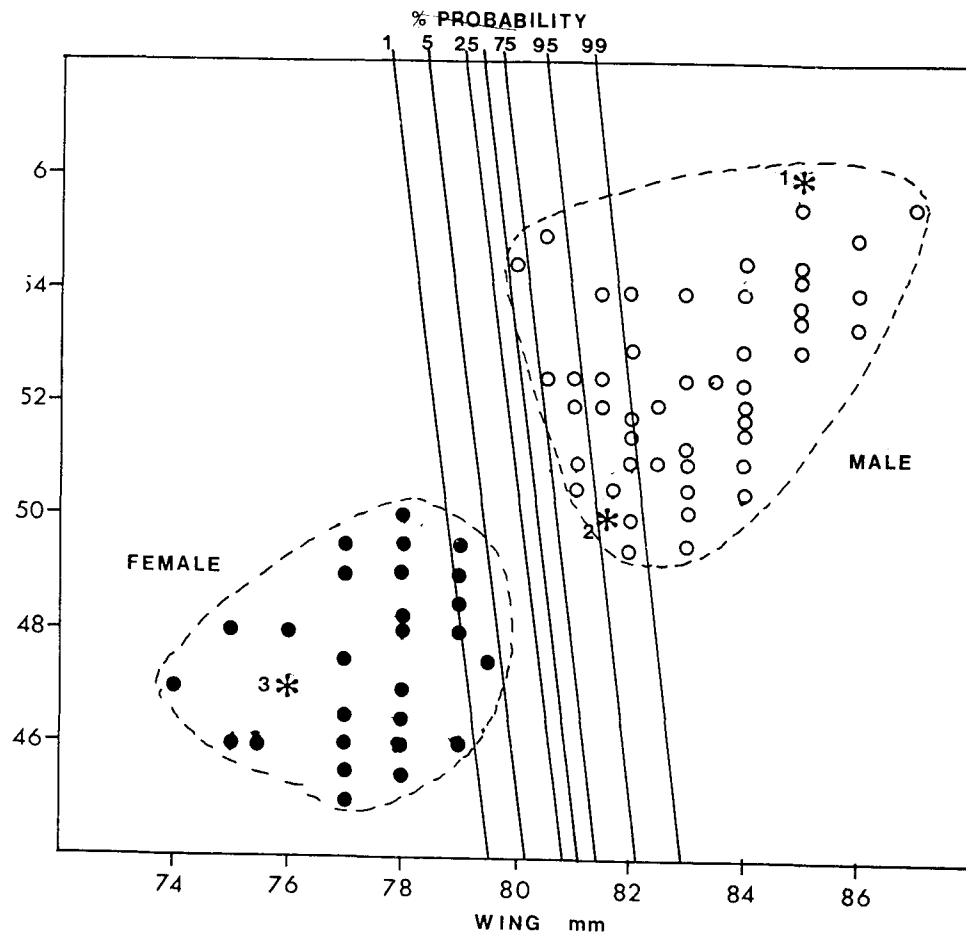


Figure 2: Size segregation of male (O) and female (●) Chestnut Weavers, with probability contours, corresponding to given probabilities of being male. The three highlighted values represent the examples detailed in the text.

frequency distributions for known-sex males and females showed some overlap, except in the case of wing-length, clearly indicating that, for all body measurements, most males were larger than females. Indeed, for all characters males were significantly larger than females (Table 1; Student  $t$  Tests,  $P$ 's  $< 0.01$ ). Sexual dimorphism has been reported for a few other Ploceid species (Craig & Manson 1981, Craig 1984), although the degree of sexual size dimorphism varies considerably between species (Craig & Manson 1981, Maclean 1985).

Chestnut Weavers can be sexed correctly in most cases using wing-length, skull-length and tail-length in discriminant analysis (Komen in press). However, for sexing problems in the field, it is convenient to use only two classes of body measurements since this allows a simple graphic representation. Wing-length and tail-length, two measurements commonly taken by ringers, provide a reasonable determination of sex (Figure 2).

By measuring wing- and tail-length and plotting these two measurements on the graph provided, one is able to allocate a sex with a specified probability that the bird is a male. A value plotted on, or very close to, the 0.5 probability contour will of course be meaningless, since the bird would have a 50% chance of being either male or female. In practice, however, very few values fall within the 0.25 and 0.75 probability contours, suggesting that the method is useful in sexing most Chestnut Weavers with a specified measure of confidence.

**EXAMPLES:** 1. An adult Chestnut Weaver in eclipse plumage; wing length = 84.5 mm, tail length = 56 mm.

This bird is obviously a male, with a greater than 99% probability of being male.

2. An adult Chestnut Weaver in eclipse plumage; wing length = 80.8 mm, tail length = 50 mm.

This bird is male with a probability of between 95% and 99% of being male.

3. An adult Chestnut Weaver in eclipse plumage; wing length = 76 mm, tail length = 47 mm.

This bird has much less than 1% probability of being male and is therefore in all likelihood a female.

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#### WHAT IS THE STATUS OF THE DAMARA REDBILLED HORNBILL?

The Damaraland population of the Redbilled Hornbill Tockus erythrorhynchus damarensis has been recognised as distinctive since its description by Shelley in 1888. More recently, Kurt Sanft of Berlin, in his 1960 monograph of the Bucerotidae (Das Tierreich 76), confirmed that the population was indeed discrete but that, based on museum skins, it appeared to be intergraded with the more north-easterly T. e. rufirostris.

The two populations are easily separated in the field; the Damaraland form has a dark brown eye set in a very white face and the more easterly form T. e. rufirostris has a yellow eye set in a face with grey cheeks. The Damaraland hornbill also has much more white in the secondaries and tail, almost as much as a Monteiro's Hornbill T. monteiri.

Recently I was able to visit Namibia briefly, to begin to explore this problem and it seems sufficiently exciting to ask the help of local bird enthusiasts in effecting its solution. On my travels to the Daan Viljoen Game Reserve near Windhoek, to the farm Otjongoro north-west of Omaruru and to Okahandja and Otjiwarongo, I only encountered the Damaraland race of this Hornbill. By superimposing the map of specimen localities from Sanft's (1960) monograph on the that of sight records from the Namibia Bird Atlas, supplied to me by Dr Chris Brown, one can expect a possible hybrid zone to lie just east of a line passing through Otjiwarongo and Ruacana (see figure).

What is required now is to find the exact position of the contact zone between the populations, and I therefore ask for any sightings, old and new, of Redbilled Hornbills whose eye colour is known. Old photographs, quick checks while driving around or previous recollections will all be welcome. Please send your records to Dr Alan Kemp, Department of Birds, Transvaal Museum, P.O. Box 413, Pretoria 0001, South Africa.

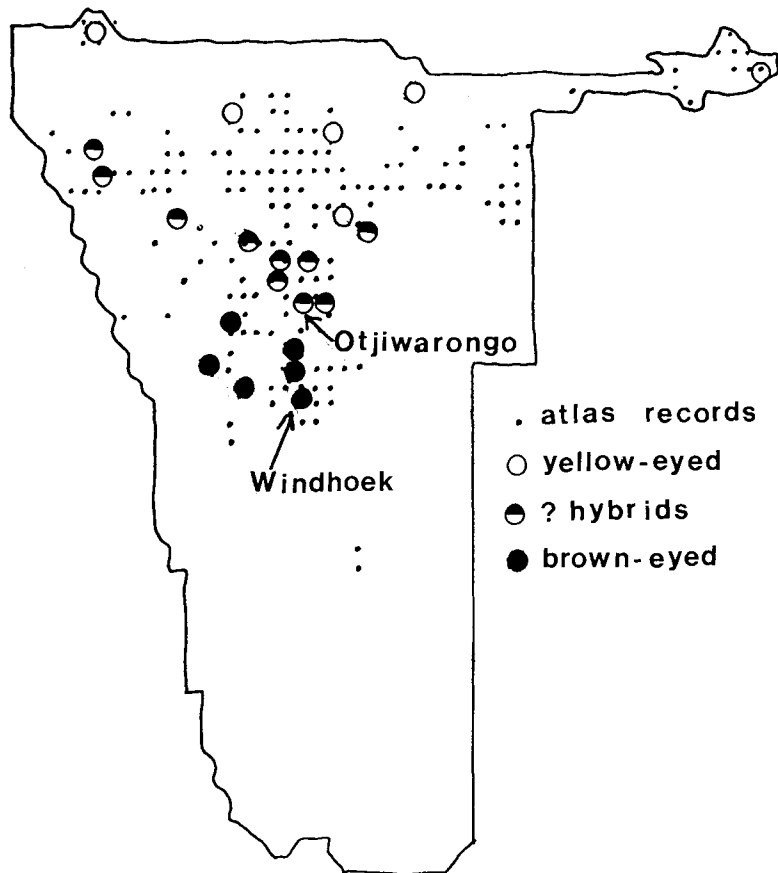
The importance of the question is that this may prove to be yet another 'South-west Special', the Damaraland Redbilled Hornbill, a good species in its own right. Its known range fits that of many other endemics, and its distinctive coloration, including much more extensive pink throat patches than found in other Redbilled Hornbills, as well as possible differences in behaviour, all support this viewpoint.

It is interesting to note that the isolated East African population of Redbilled Hornbills, the nominate race T. e. erythrorhynchus, also seems to prefer drier habitats than the southern form T. e. rufirostris, and has a brown eye and white face. It differs somewhat in its



bobbing display and calls, its throat patches and details of plumage, but it may yet prove to be more closely related to the Damaraland form than its yellow-eyed neighbour. Joris Komen of the State Museum of Namibia assisted me to obtain tissue of the Damaraland form, and plans are being made to compare its proteins and mitochondrial DNA with those of the other populations, to another angle on its status. Your help in discovering the contact zone, where possible cases of hybridization can be studied, would be much appreciated.

Dr Alan Kemp, Department of Birds, Transvaal Museum, P.O. Box 413, Pretoria, South Africa.



#### LEAVES AND FLOWERS IN THE DIET OF GREY LOURIES AND YELLOWBILLED HORNBILLS IN NAMIBIA.

Both the Grey Lourie Corythaixoides concolor and Yellowbilled Hornbill Tockus flavirostris are well known species in southern Africa, yet information on their diets is scanty. This is especially true for information on plant material in their diet. During October 1988 both these species were seen feeding on young leaves of several tree species and, in one instance, Aloe leaves.

At CDM camp, about ten kilometres west of Tsumkwe, Bushmanland, both species were seen feeding on young leaves and leaf buds of Boscia albitrunca. Several Grey Louries could be found in Boscia trees at any one time. Leaf buds were selected in preference to leaves and considerable time was spent "choosing" the right bud, on occasion buds being picked and then rejected. Yellowbilled Hornbills were observed doing this on only one occasion, and they were not selective in their choice of leaves or buds. One hornbill (presumably male) would occasionally feed the other bird (female?) with a leaf or bud, but only after the female "demanded" the bud or leaf by hopping close to the male and extending her beak towards him.

Grey Louries were observed feeding on leaf buds and young leaves of Acacia erioloba at Leeupan in the Kaudom Game Reserve, Kavango. In the surrounding deciduous Burkea woodland they were seen to eat the flowers of Burkea africana. The flowers of this tree are probably wind-pollinated and are therefore likely to be low in nectar. The direct benefit to the birds is probably only as raw vegetable material, not the high energy sugars normally found in nectar.

At CDM Camp, a large stand of Aloe zebrina plants have been cultivated near the house. Several Grey Louries were seen foraging in this stand of plants and were initially thought to be catching insects. On closer inspection they were found to be feeding on the leaves of the plants. The soft fleshy base of the leaves was eaten first and then the central portion was eaten outwards leaving only the tough marginal spines. Several plants were reduced to a spiral of leaf "stumps" in this way.

Yellowbilled Hornbills are normally insect eaters and although Grey Louries are known to eat a range of plant parts their preferred food is fruiting material. The behaviour and observed diet of these birds is ascribed to a shortage of preferred food items at this time of the year. The high temperatures and dry conditions, and the phenology of the food plants at the time when the observations were