Published for
The African Wildlife Foundation's
FOUR CORNERS TBNRM PROJECT
by
THE ZAMBEZI SOCIETY and
THE BIODIVERSITY FOUNDATION FOR AFRICA
2004

The Zambezi Society
P O Box HG774
Highlands
Harare
Zimbabwe
Tel: +263 4 747002-5
E-mail: zambezi@mweb.co.zw
Website : www.zamsoc.org

The Biodiversity Foundation for Africa
P O Box FM730
Famona
Bulawayo
Zimbabwe
E-mail: bfa@gatorzw.com
Website: www.biodiversityfoundation.org

The Zambezi Society and The Biodiversity Foundation for Africa are working as partners within the African Wildlife Foundation's Four Corners TBNRM project. The Biodiversity Foundation for Africa is responsible for acquiring technical information on the biodiversity of the project area. The Zambezi Society will be interpreting this information into user-friendly formats for stakeholders in the Four Corners area, and then disseminating it to these stakeholders.

THE BIODIVERSITY FOUNDATION FOR AFRICA (BFA is a non-profit making Trust, formed in Bulawayo in 1992 by a group of concerned scientists and environmentalists. Individual BFA members have expertise in biological groups including plants, vegetation, mammals, birds, reptiles, fish, insects, aquatic invertebrates and ecosystems. The major objective of the BFA is to undertake biological research into the biodiversity of sub-Saharan Africa, and to make the resulting information more accessible. Towards this end it provides technical, ecological and biosystematic expertise.

THE ZAMBEZI SOCIETY was established in 1982. Its goals include the conservation of biological diversity and wilderness in the Zambezi Basin through the application of sustainable, scientifically sound natural resource management strategies. Through its skills and experience in advocacy and information dissemination, it interprets biodiversity information collected by specialists like the Biodiversity Foundation for Africa and uses it to provide a technically sound basis for the implementation of conservation projects within the Zambezi Basin.

THE PARTNERSHIP between these two agencies was formed in 1996 as a result of mutual recognition of their complementarity. They have previously worked together on several major projects, including the biodiversity component of IUCN's Zambezi Basin Wetland project and the evaluation of biodiversity in Tete province described in detail in the first Four Corners TBNRM Biodiversity Information Package.

ISBN 0-7974-2835-6

RECOMMENDED CITATION:
Timberlake, J.R. & Childes, S.L. 2004. *Biodiversity of the Four Corners Area: Technical Reviews Volume Two* (Chapters 5-15).
Occasional Publications in Biodiversity No 15,
Biodiversity Foundation for Africa, Bulawayo/Zambezi Society, Harare, Zimbabwe.

ACKNOWLEDGEMENTS

In addition to all the authors of the chapters in this document,
The Zambezi Society and the Biodiversity Foundation for Africa
wish to thank the following for peer review or additional assistance:-

John Burrows
Colin Craig
Barbara Curtis
Cornell Dudley
Kevin Dunham
Peter Frost
Debbie Gibson
Mike Griffin
Michael Irwin
Bas Jongeling
Linley Lister
Gillian Maggs
Anthony Mapaura
Brian Marshall
Susan Ringrose

We also wish to thank Henry Mwima, Nesbert Samu,
Othusitse Lekoko, Daudi Sumba, Gitonga Kathurima,
Maureen Mashingaidze and Simon Metcalfe
of the African Wildlife Foundation

CHAPTER 7. BIRDS OF THE FOUR CORNERS AREA

CONTENTS

FIGURES

TABLES

APPENDICES

CHAPTER 7. BIRDS OF THE FOUR CORNERS AREA

Peter Mundy

Agapornis nigrigenis, Black-cheeked Lovebird

CHAPTER 7. BIRDS OF THE FOUR CORNERS AREA

Peter Mundy

7.1 INTRODUCTION

Southern Africa and its neighbouring countries of Malawi, Zambia and Mozambique, are blessed with an army of avid bird watchers, a small cadre of ornithologists both professional and amateur, an array of field guides for identification, and many other technical books on the birds of the region.

Birds are mobile and many of them are noisy, so in principle they are fairly easy to find, especially outside forest areas. An area simply needs to be visited by observers, and at the preliminary level no capturing or killing is necessary. However, there are three climatic seasons in the year - hot wet (November to March/April), cold dry (May to August) and hot dry (August to November) - and any comprehensive survey of an area needs visits in all three as bird communities change. An earlier survey of wetland birds (Mundy 2000a) in the Zambezi Basin covered much of the present Four Corners area, but in the present review the aim is to list and examine all species in this part of south-central Africa. The study of birds and the activity of bird watching have been going on in Africa for a long time, and it is first necessary to take a historical view of efforts within the designated area. This view will form the basis for our current knowledge of the birds in the area whether on ecology, processes or conservation issues.

7.2 HISTORICAL VIEW

Continental Africa has been covered by ornithology texts for more than 100 years, but the 'modern' era (in the sense of post-Second World War) was started by C.W. Mackworth-Praed and C.H.B. Grant who produced checklists of species from 1952 to 1973 that covered sub-Saharan Africa or the Afrotropical zoogeographical region. This was previously called the Ethiopian region. Six volumes were published (Mackworth-Praed & Grant 1952, 1955, 1962, 1963, 1970, 1973). Contemporaneously, C.M.N. White drew up checklists of species for the whole of Africa in four volumes (e.g. White 1965). In 1966 Reg Moreau (1966) published an important synthesis with an ecological and geographical approach. His key book was quickly followed by two atlases of bird distribution in sub-Saharan Africa (Hall & Moreau 1970, Snow 1978) that largely relied on specimen data for small birds but included sightings for the large birds. The former used a super-species approach. These atlases are outstanding in their scope, in that they use only point-locality data and do not 'smear' over any of the distributions and are still probably unique in the world. For any biodiversity information on African birds, these two atlases are the starting points. Unfortunately, however, the later atlas failed to include Palaearctic migrants and a few other species. To some extent these species were addressed earlier, again by Moreau (1972). Soon a series entitled *The Birds of Africa* began, of which six of seven volumes for the mainland have now been published (Brown *et al*. 1982, Urban *et al*. 1986, Fry *et al.* 1988, Keith *et al.* 1992, Urban *et al.* 1997, Fry *et al*. 2000). This series is indispensable and has entirely superseded the earlier series by Mackworth-Praed and Grant.

When dealing with birds of Africa there are two major divisions: first, the birds themselves are usually divided taxonomically into non-passerines and passerines (for example, the two atlases above); the two groups are approximately equal in numbers of species. Second, Africa is divided zoogeographically into the Palaearctic region of North (Arab) Africa, and the sub-Saharan or Afrotropical region. Palaearctic Africa has been very well and scholarly covered by the nine-

volume 'handbook' series subtitled *The Birds of the Western Palaearctic* (e.g. Cramp & Simmons 1977, Cramp & Simmons 1994). More relevant for our purposes are the recent up-dates on species' distributions and other matters in the Afrotropical region by Bob Dowsett and colleagues (Dowsett & Dowsett-Lemaire 1993, Dowsett & Forbes-Watson 1993). Also using the Afrotropical region is the current initiative at counting waterbirds at wetlands (Perennou 1991), which is continuing (Dodman & Diagana 2003).

Other global initiatives have reverted to dealing with the whole continent, including the offshore islands and Madagascar. These include accounts of threatened birds (Collar & Stuart 1985), important bird areas (Fishpool & Evans 2001), and species action plans (Davies 2000), as well as the endemic bird areas of the world (Bibby *et al*. 1992, Stattersfield *et al*. 1998) and the recent global red data book (Stattersfield & Capper 2000).

These volumes, totalling about 12,000 pages specifically on the birds of Africa, their taxonomy, distribution, and conservation, are by any yardstick a phenomenal accomplishment. And yet there is still a great deal to do. Much of the work has been done within national political boundaries, and most countries in Africa have their bird book, a field guide to identification (probably on a regional basis), and a national checklist. A major initiative since 1980 has been national atlases of birds, and four of the countries have their own, albeit on two different scales.

Each of the five countries of the Four Corners area is now considered individually below.

7.2.1 Angola

Little could be achieved in the last 40 or so years due to the civil war; even now there is still the problem of land mines. Angola got its first national work in 1877-1881, and must have been among the very first African territories to be so treated. Eighty years went by before a truly comprehensive list was published (Traylor 1963), and then a volume on non-passerine birds appeared (Pinto 1983). Fortunately, the Angola birds have recently been summarised (Dean 2000) and 915 species are included. This review includes a map of the country with collecting sites (Dean 2000, Fig. 1), but only one is shown in the far southeastern corner. 211 species are recorded for the Four Corners area.

7.2.2 Botswana

As the Bechuanaland Protectorate, the country got its first national treatment only in 1964 (Smithers 1964), based mainly on specimens. However, it had been included many years earlier in a regional work (Roberts 1940), in which the author barely gave the country a name. Another generation elapsed before Botswana got its own field guide (Newman 1989) and its own atlas based on half-degree-squares (i.e. 30' x 30') and on sightings rather than specimens (Penry 1994). The country was also included in the southern African bird atlas project (Harrison *et al*. 1997), again on the half-degree-square basis. There is an active bird club - BirdLife Botswana (previously the Botswana Bird Club) - which publishes its own journal *Babbler* and newsletter *Familiar Chat*. A bibliography from 160 years of bird study in Botswana has been published (Borello & Borello 1997), an achievement almost unique in Africa.

Northern Botswana has hosted many ornithological expeditions, particularly by Reay Smithers and colleagues (Borello & Borello 1997: 13-29). It should be noted that expeditions collect birds that end up in museums as specimens, and many of them have gone to the Natural History Museum in Bulawayo (for example, Irwin, Niven & Winterbottom 1969).

Specifically within the Four Corners area of Botswana (north of 21.5^{o}N and east of 22^{o}E) there have been checklists produced for small areas on a basis of sightings rather than specimens.

Thus, Moremi (Fraser 1971, Tinley 1973), the northeast section of Sua Pan (Mundy & Borello 1990), Nata Lodge (Anon. 1997), and the Okavango (Anon. 1999) have bird checklists of varying quality. Ten years of counts of waterbirds in Botswana, including at several sites in the north, have been summarised (Tyler 2001). Currently there are 555 species on the national list (Penry 1994), with 502 from the Four Corners area.

7.2.3 Namibia

The country received its first national list over 60 years ago (Hoesch & Niethammer 1940), which was not up-dated until a generation later (Winterbottom 1965, 1971). These last two lists were still termed "preliminary". In the run-up to independence, a list of 617 species was produced (Williams n.d.). The country had been included in *The Birds of South Africa* (Roberts 1940) and all subsequent editions, including the latest (Maclean 1993), and in the regional field guides (e.g. Newman 1996, Sinclair *et al.* 1997). Namibia has its own rather scanty photographic guide (Sinclair & Sinclair 1995), and many years of atlassing birds throughout the country since 1970 were published as part of the southern African bird atlas project (Harrison *et al.* 1997). Uniquely in the region, local ornithologists have produced an "avifaunal database" (Robertson & Jarvis 1999); this is electronic and user-friendly, and is a priceless tool offered freely to the global community. The database allows the generation of checklists for any area of the country.

Also unique in the region - and probably in Africa as a whole - is a general publication on biodiversity in the country by the national task force (Barnard 1998). This has about 11 pages on birds in various aspects.

The Four Corners area includes all of Namibia's Caprivi Strip east of the Kavango River, at 21.5°E. Smithers (1964) included the Caprivi in his book on Botswana's birds. More recently, checklists for parts of the Caprivi have been published by Tinley (1966), Kemp (1971), Clancey (1980), Koen (1988), Branfield (1990) and Brown (1990). The local Namibian Bird Club publishes a journal *Lanioturdus*, which has unfortunately become sporadic. Currently there are 658 species on the national list (Brown *et al.* 1998), with 462 from the Four Corners area.

7.2.4 Zambia

The then Northern Rhodesia was subject to the attentions of Con Benson, Charles Pitman, Charlie White and Jack Winterbottom, and among them they published no less than four checklists for the country. A small volume was also published that contained much information on Zambian birds (Benson & Irwin 1967). Zambia got its first bird book in 1971 (Benson *et al*. 1971), which listed 699 species. This is the starting point for bird study there.

Zambia falls outside activities in 'Southern Africa', and therefore does not feature in the bird books and field guides from that region. It is included in Mackworth-Praed and Grant's first series (Mackworth-Praed & Grant 1952, 1955), but unfortunately falls between the southern and East African spheres of influence. Certain field guides have, however, reached Zambia in terms of bird distributions (Williams & Arlott 1980, Van Perlo 1999), but an indispensable addition was published by Aspinwall & Beel (1998) which contains atlas maps for 136 species additional to those in southern Africa. Only 19 of these, however, occur within the Four Corners area. An atlas of the birds of Zambia has been prepared (Dowsett & Aspinwall, in prep.). The Zambian Ornithological Society was formed in 1969 and publishes a monthly newsletter. It has recently started a series of annual *Zambia Bird Reports* (e.g. Leonard & Peters 1999), the first one being for 1997. Currently there are 740 species on the national list (Aspinwall & Beel 1998), though new ones are being added. The total is probably now around 750 species, with 542 in the Four Corners area.

Within the Four Corners area, two checklists have been published, for the Kafue National Park (Brooke 1966) and for the Victoria Falls area (Dowsett 1990).

7.2.5 Zimbabwe

The first guide to the birds of the then Southern Rhodesia appeared in 1929 (Priest 1929), quickly followed by a huge four-volume work by the same author published in the years 1933-1936 (Priest 1933-36). A generation passed before the next checklist was produced in 1957, by Reay Smithers and colleagues (Smithers, Irwin & Paterson 1957), based entirely on specimens. Meanwhile the Rhodesian Bird Club and the Rhodesian Ornithological Society formed in 1948 and 1951 respectively, but sensibly were merged within a few years in 1954. Another generation passed before *The Birds of Zimbabwe* was published just after independence (Irwin 1981). This was in fact a summation of work on the birds of Zimbabwe and is based both on specimens and sightings. This book is the starting point for any bird study in the country.

A little earlier, Irwin (1978) had published a bibliography of the literature on the birds of the country. This was a formidable achievement and remained unique in Africa until the Botswana equivalent was produced (Borello & Borello 1997).

The hundreds of members of the ornithology society - now called BirdLife Zimbabwe - have been very active and produced much data, including different kinds of checklists. Those within the Four Corners area include three from Hwange National Park (Davison 1963, Steyn 1974, Hustler 1986), and two from the Victoria Falls to Kazungula area (Jensen 1966, Pollard n.d.). Others have been produced for Kazuma Pan (P. Mundy and D. Rockingham-Gill, in prep.) and the Matetsi Safari Area (S. Childes, pers. comm.), but are still unpublished. Atlas data from the country featured in the southern African atlas project (Harrison *et al.* 1997), while a huge coloured extravaganza of a book was Zimbabwe-inspired (Ginn, McIlleron & Milstein 1989).

At first, along with the two bird clubs, there were two bulletins of bird notes. These eventually became one, which itself became the *The Honeyguide* in May 1962; 185 issues have appeared so far. In addition a newsletter *Babbler* is produced. Currently the field card of Birdlife Zimbabwe has 674 species, so that about two new species per year have been added since the publication of *The Birds of Zimbabwe*. Of these, 504 occur in the Four Corners area

Throughout the last half century the Natural History Museum in Bulawayo was developing a bird collection that now numbers about 100,000 study skins, plus a huge egg collection and skeletons. It is the largest single such collection in Africa and in the southern hemisphere, and reckoned to be 24th largest in the world (Mearns & Mearns 1998). While information on the egg collection has been published (James 1970), no database as yet exists for the skins. This collection is a priceless facility but is very poorly known in the country at large. The museum publishes *Arnoldia Zimbabwe*, which contains many ornithological papers from the region.

7.3. CURRENT KNOWLEDGE

A checklist of 601 species for the Four Corners area is given as Appendix 7.1 with an indication of countries of occurrence. Most of them are breeding 'residents', usually to be seen in any area all the year around. There are 76 Palaearctic (non-breeding, 'wintering') migrants from the north (18 of which are vagrants), and 52 Afrotropical or intra-African (breeding) migrants from the equatorial zone, in the total. Twenty-two other species are considered to be vagrants, i.e. seen very rarely because they are on the very edge of their range or even extra-limital.

Due to the enthusiasm of local bird watchers, and the fact that all countries except Angola have bird clubs, it can be expected that a general knowledge of the species in the area is very good. However, odd new vagrants are certain to visit from time to time and be added to the list. Observers are always on the lookout for such occasions. Indeed, one of these - Golden Pipit *Tmetothylacus tenellus* - was seen at Hwange National Park in March 1972, and promptly collected for the Bulawayo Museum. Another, Little Ringed Plover *Charadrius dubius,* was also seen in Hwange National Park in January 2002 (Carbone 2003).

There are two important natural history collections in or near the Four Corners area - the Livingstone Museum and the Natural History Museum in Bulawayo. From a collection of about 10,000 bird specimens, the Livingstone Museum has 3062 specimens from the study area (C. Mateke, pers. comm.), almost all of them from the Zambian portion of the Four Corners; 377 species are included in this sample, or 70% of the checklist for southwest Zambia. The much larger collection of about 100,000 bird specimens in the Bulawayo Museum was made on the basis of a pan-African representation, and only 1326 were actually collected in the Four Corners area (B. Magwizi, pers. comm., 2003), although this total is said to be a "gross underestimate" (M.P.S. Irwin, pers. comm.).

Likely gaps at the identification level are three:

i) species distributions are correlated with the coverage of any area by the observers; Angola is very poorly covered;
ii) some populations or subspecies are expected to be up-graded to full and new species by various authorities. Indeed, the taxonomy of birds is in something of a flux due to new species' concepts. This trend particularly affects some of the small passerines;
iii) the representation of species in the two local museums is well short of complete, and it can be presumed that some populations would be found to be specifically distinct.

A large gap is caused by the lack of biological knowledge on many species: the niche, life history, voice, or ecological requirements. In fact probably all species could benefit from this kind of attention, even conspicuous and apparently well-studied birds such as the Wattled Crane. But certainly all 'flagship' and endemic species should be studied.

A final gap comes from the bird watcher's ability to spot-and-plot, i.e. identify a species to an accurate locality, but his/her inability to worry about counting them. That is, we have very little data on numbers of birds, and therefore their densities in defined areas. The waterbird census attends to this - observers must count all species - but as yet no other project does. Large and conspicuous birds such as cranes present the least problems; cranes, storks, flamingos, etc. can be counted from the air, and even from a moving car, but the small birds need a different technique or techniques, e.g. use of mist nests, and point counts.

7.4 ECOLOGY

Most of the Four Corners area is based on Kalahari sands (Mendelsohn *et al*. 2002). From this area White (1983) recognized nine vegetation types, from *Cryptosepalum* forest through woodlands to savanna and grassland, and two wetland types. These are listed in Table 7.1. In striking contrast, BirdLife International considered only two "biomes" as covering the Four Corners area - Zambezian and Kalahari Highveld (Fishpool & Evans 2001, p.17). These authors defined a biome as a "major regional ecological community, characterised by distinctive life forms and principal plant species" (Fishpool & Evans 2001, p.12). These two biomes are too broad-ranging to be useful for examining bird communities in detail.

Table 7.1 Vegetation types and bird habitats

Vegetation Type (from White 1983)	**Bird Habitats**
Dry evergreen forest (*Cryptosepalum*)	Forest
Wetter miombo woodland	Miombo
Dry deciduous forest	Teak
Mopane woodland	Mopane
Edaphic grassland on Kalahari sand	Grassland
Grassland with semi-aquatic vegetation	Floodplains and freshwater pans
Undifferentiated/*Acacia*	Kalahari savanna
Herbaceous swamp	Okavango Delta
Halophytic vegetation	Makgadikgadi salt pans
–	Riverine
–	Basalt Gorge (Batoka)
–	Lakes (Ngami, Xau, Itezhi-tezhi, Liambezi)

The birds however recognize 12 habitats, which include White's nine but with riverine woodland, basalt gorges, and open lakes as additions. These habitats are listed in Table 7.1. Within habitats bird species occupy different niches, such as canopy, trunk and leaf litter in woodland, surface-feeders or divers in lakes, and so on. A description of the niche of each bird species is beyond the scope of this review.

Not only do most of the 601 species listed in the Appendix occur in all of the countries in the Four Corners area - excepting southeast Angola, there are on average 502 species (84%) per country (s.d. +/- 33) - but many of these are widespread across habitats. These are the generalists or ecologically tolerant species. For example, certain hawks, cuckoos, owls and kingfishers may occur in any woodland and shrubland between forest and grassland. Among passerines the Fork-tailed Drongo, the Southern Black Tit and Arrow-marked Babbler are similarly generalists.

A difficulty in precisely defining the habitat of birds arises from their flight - many of them overfly all kinds of habitats, whether on migration or in between foraging bouts. A White-backed Vulture for example can find or use carcasses in any woodland-shrubland-savanna-grassland habitat, including the Okavango delta, Makgadikgadi pans (dead flamingos), basalt gorges, and also a lake if the carcass is bloated and floating.

Even a specialist may at times be found outside its normal habitat, simply because it could fly there. Greater and Lesser Flamingos, for example, are specialists of soda pans, but can be found both in fresh water and in the sea. These caveats aside, certain birds are closely associated or even restricted to certain habitats, and these are indicated in Table 7.2.

Within the Four Corners area *Cryptosepalum* forest is very restricted. Benson & Irwin (1965) studied its avifauna about 100 km to the north of the area, and listed 15 species as "typical of

Table 7.2 Some bird species typical of the 12 habitats in the Four Corners Area.

Vegetation Type	Characteristic species
Cryptosepalum forest	Crested Guineafowl, Lady Ross's Turaco
Riverine woodland	Narina Trogon Pel's Fishing Owl Angola Pitta White-rumped Babbler
Miombo woodland	Small passerines of canopy (e.g. Mashona Hyliota), Lesser Blue-eared Starling
Mopane woodland	Black-cheeked Lovebird, Red-billed Hornbill, Arnot's Chat, Long-tailed Starling
Teak woodland	Bradfield's Hornbill, Green-capped Eremomela, Black-eared Canary
Acacia savanna	Ostrich, Burchell's Sandgrouse, Pied Babbler, Burchell's Starling
Grassland (sands)	Red-billed Francolin, Grassveld Pipit
Floodplain/pans	Natal Nightjar, Black-backed Cisticola, Red-shouldered Widow
Basalt Gorges	Peregrine Falcon, Taita Falcon, Rock Pratincole, Black Swift
Okavango Delta	Slaty Egret, Coppery-tailed Coucal, Greater Swamp Warbler, Chirping Cisticola, Pink-throated Longclaw
Makgadikgadi soda pans	Greater Flamingo, Lesser Flamingo, Chestnut-banded Plover
Freshwater lakes	Fish Eagle, Whiskered Tern, White-winged Tern

evergreen forest". Only two of these occur in the Four Corners area: Crested Guineafowl (there named *Guttera edouardi*, but now considered to be *G. pucherani*) and Lady Ross's Turaco. In fact, the guineafowl has a wider habitat tolerance than just forest, and the turaco is something of a wanderer, as it has been seen on the south side of the Zambezi River, having perhaps moved through riverine woodlands (Cohen 1997).

Five types of woodland are indicated in Table 7.2 as habitats for birds, and four types of wetlands; all have certain species attributed to them. Miombo woodland is notable for bird 'parties' mostly comprising small passerines, although a few non-passerines can be present, for example woodpeckers. *Acacia* savanna is also notable for its usage by passerines, but here the birds do not form a party, rather being much more spread out among the trees. The basalt gorges are notable for their raptors including owls, and a few other rather specialized birds such as Rock Pratincole. All the wetland habitat types are notable for the diversity, and abundance in the case of the Okavango, of waterbirds, as shown in a previous study on the Zambezi Basin (Mundy 2000a).

As mentioned under the Historical section above, atlases are available for all countries in the Four Corners area except Angola. Indeed, Botswana has produced two, one compiled throughout the 1980s (Penry 1994) and the second overlapping it in 1987-1992 (Harrison *et al*. 1997). The former shows that the half-degree-squares centred on the northwest Okavango (west of Chief's Island), Maun and Kasane, have high bird diversity, respectively 411, 408 and 405 species. (In the Four Corners area, a quarter-degree-square has an approximate area of 740 km^2 , therefore

half-degree-squares are about 2960 km^2 each). Regretfully, bird watchers rarely list birds according to their habitats but by 'squares', though it must be acknowledged that it is far easier for amateurs to record species by locality (i.e. square) than by habitat. The Okavango Delta is said to host 450 species of birds (Tyler & Bishop 2001), Hwange National Park 410 species (Hustler 1986), and an area of 1500 km^2 along the Zambezi River from Victoria Falls to Kazangula has "over 415 species" (Pollard n.d.). In Namibia, the highest count in an area is 412 species in the Mahango Game Reserve (Brown *et al*. 1998), just outside the study area. The vegetation of the reserve is broad-leaved tree-shrub savanna on Kalahari sandveld (Mendelsohn *et al*. 2002) and floodplain. We expect the Okavango to have the greatest diversity because of its overall area (around 20,000 km^2) and that it contains several habitats including open water. An old list from the Kafue National Park indicates 418 species (Brooke 1966), and more by now would certainly have been recorded. Diversities in 12 areas are listed in Table 7.3.

Table 7.3 Number of bird species on record in some places within the Four Corners area.

Place	**Area** (km^2)	**Habitat**	**No. spp**.	**Reference**
Okavango Delta	c.20,000	several	450	Tyler & Bishop 2001
Kasane	625	river, woodlands	405	Penry 1994
Nata Lodge	1257	several	301	Anon. 1997
NE Sowa Pan	c.1200	soda pan, woodlands, grassland	294	Mundy & Borello 1990
Chobe-Linyanti swamps	<8880	wetland	129 waterbirds	Mundy 2000a
Mahango Game Reserve	245	broadleaf woodland & floodplain	412	Brown *et al*. 1998
E. Caprivi	11,500	several	375 (430)	Koen 1988 (Brown 1990)
W. Caprivi	5760	several	339	Brown 1990
Kafue National Park	22,400	several	418	Brooke 1966
Zambezi River & interior	1500	several	415	Pollard n.d.
Hwange National Park	14,600	several	410	Hustler 1986
Kazuma Pan	313	floodplain, grassland, woodlands	c.300	PJM + DVRG in prep.

In terms of bird species diversity, a large area of more than 10,000 km^2 is likely to host around 450 species; a quarter-degree-square of 740 km^2 would have about 400 species; and any one habitat very much less (100 species or less). For example, Hustler (1986) has listed the habitats of birds in the large Hwange National Park, at the same time noting similar cautions to those above. Here teak woodland hosts 59 specialists, "shallow soils" (mopane woodland and open habitats) 24 species, and "ephemeral pans" 43 species. But by far the largest group is

"throughout", i.e. the generalists, which total 181 species, nearly one-half of the full Park checklist. In any large area that has several bird habitats, *Acacia* woodland is likely to host the highest diversity of terrestrial species, and the birds are spread out in this habitat. Wetland habitats that host waterbirds will have the highest overall diversity and probably also the highest numbers or overall abundance of birds. Thus the wetlands of the Chobe-Linyanti system host 129 species (Mundy 2000a), and stunning numbers of certain birds, such as 500-700 White Pelicans (Tyler & Bishop 2001), 2150 Openbill Storks in July 2000 (Tyler 2001), and 1000 Spur-winged Geese in August 1997 (Tyler 2001). Tyler (2001, p.89) notes that in the Okavango Delta as a whole, 97 species of waterbird have been recorded. In 1989, when Lake Ngami again started to fill with water, 40,000 'waterfowl' were counted and estimated along only 5 km of shoreline in November (Penry & Tarboton 1990). This incredible number included 10,000 each of Black-winged and Red-winged Pratincoles. These numbers are totally eclipsed by the 500,000 Red-billed Teal that were estimated there in October 1954 by Michael Irwin (pers. comm.). Considering that most waterbirds are non-passerines, which in general are much larger and heavier than the passerines in *Acacia* woodland, then a wetland/lake hosts the highest diversity, numbers and biomass of any habitat.

Among the Palaearctic migrants, there are 53 species of non-passerines and 23 passerines. The majority (34) of the first group inhabit wetlands/lakes when they spend the (austral) summer in the south, whereas the majority (12) of the passerines live in woodlands, favouring *Acacia* woodland. Most of these migrants are insect feeders, and many of them are searching for outbreaks of flying termites and ants, and army worm caterpillars. These emergences can occur anywhere, so Palaearctic migrants can be anywhere and are hence very difficult to track by ornithologists.

7.5 PROCESSES

Birds must locate a habitat with sufficient food if they are to survive in an area. More food, and often of a different kind, is needed in order to breed successfully: 524 species breed in the Four Corners area. Even Palaearctic migrants are searching for suitable habitats, in the way that a traveller searches for an oasis, albeit the ‘habitats’ for many of them are transitory. Seven major ecological processes affect the lives of birds one way or the other.

This is a semi-arid corner of Africa, with an average rainfall in the middle parts of about 600 mm per annum, less to the south and more to the north. The area is rather flat, around 1000 m altitude, with the Okavango and Makgadikgadi in a 'basin' in the south, the Zambezi River cutting a shallow trough, and the highest part on the Batoka plateau in the north. The key aspect, however, is the year-to-year variation in rainfall, producing floods to droughts (e.g. Tiffen & Mulele 1994). Not only does the rainfall vary over the area itself, thus directly influencing the biomass of woody vegetation and grasses, but also it varies over the catchments of the influential rivers, viz. Zambezi, Kavango, Kwando and Kafue, and even the smaller Boteti and Nata. It is these rivers that fill up the floodplains, swamps, lakes and pans. All the waterbirds and grassland birds, including gamebirds and queleas for example, will fluctuate in numbers accordingly. This effect can be most clearly seen with the flamingos at Sua Pan which breed only in years of a certain rainfall pattern (Mundy & Borello 1990, Simmons 1996).

Considering the direct rainfall and the indirect (catchment) rainfall that causes river flow as two separate processes, then the third significant factor is fire. Parts of the Four Corners area burn up annually, and all those grassland birds there will die or - more likely - move. A few, such as finchlarks, will move in to recently burnt grassland. Some, however, will actually attend the bush

fire, most conspicuously the White Stork, raptors and drongos. Probably none of the grassland species can return until the fresh growth has attained the normal sward height.

The Four Corners area hosts huge numbers of the African savanna elephant, and this pachyderm is an agent of habitat change, at least in certain woodland types. Knock down the trees and many small birds, canopy feeders and foliage gleaners, will decline and/or move. Investigations into this dynamic have begun (Herremans 1995), also elsewhere in the subcontinent (e.g. Cumming *et al*. 1997), and into the specific impact on Baobab trees (Swanepoel & Swanepoel 1986) which host certain species of birds such as spinetails.

A fifth process that affects birds is overgrazing by livestock. The Four Corners area is largely a cattle ranching one. High stocking densities will severely reduce ground cover as well as pulverise the soil allowing wind to erode it. Secondly, high densities of domestic livestock are likely to bring about bush encroachment. Shrubby trees, in particular *Acacia mellifera* and *Dichrostachys cinerea,* are seen as land degradation and in the end reduce the carrying capacity for herbivores (Seely 1998). This process is already blamed for the decline of a vulture (Brown 1985). It probably also causes declines in harvester termites to the detriment of migrant birds.

So-called ‘deforestation’, the use of trees for building and cooking, and the clearing of land for cropping, occurs to the north in the higher rainfall areas of Zambia. All woodland birds will suffer as a result, especially the canopy specialists and the hole-nesting birds.

Birds are known to be highly vulnerable to pesticides such as the organochlorines and organophosphates. The first causes eggshell thinning, particularly in raptors, and the second directly kills all birds depending on the dose rate. The Four Corners area has seen tsetse fly clearance schemes using pesticides (e.g. Douthwaite 1982, Ledger 1985), and also quelea control spraying using fenthion. The latter can cause severe fatalities among birds (e.g. Liversedge 1990). Problem animal control using poisons to kill carnivores, and which either deliberately or accidentally kills vultures in the process (e.g. Ledger 1980), is also seen.

7.6 MOVEMENTS

Numbers of species of birds undergo regular movements of a migratory nature, that is where a population moves between two separate geographical areas and back again. As noted above, the Four Corners area hosts 76 species of Palaearctic migrants, most or all of which have crossed the Sahara Desert, and 52 species of Afrotropical or intra-African migrants, all of which have come from the equatorial region. This is more than 20% of the total avian biodiversity. The Palaearctics arrive in the area about October and stay throughout the rainy season to March. Some individuals of several species 'over-winter', i.e. remain in southern Africa for the year and live through the austral winter, while others arrive early (September) or late (December) depending on conditions in Europe, and *en route* in Africa. Essentially, they all journey south for the austral summer to benefit from the abundance of food supplies; none of them breeds in the south.

The intra-African migrants journey south in August for the austral spring, when the temperatures warm up after winter and insects, such as termites, come out in large numbers. All of them come to feed on this abundance of insects and so to breed (although Abdim's Stork does not). This type of migrant leaves the region in March or April, though many simply disappear and do not herald their going. Herremans (1994) has provided an excellent series of dates and issues for Botswana. Due to the flatness of the Four Corners area there are no known 'fly-ways' (flight highways) for these migrants, rather they arrive and leave on broad fronts. The large birds fly during the day,

using thermals to get aloft and then gliding, while the small birds migrate at night time, using the power of their wing beats.

There are other species which make regular flights here and there, such as flamingos to and from their breeding place at Sua Pan (Borello *et al.* 1998). And there are those, particularly waterbirds, which are simply nomadic, moving to wherever suitable habitat appears, e.g. Treble-banded Plover (Tree 2003). Pan systems can be important to these species. Birds' ability to find pans when they fill up - and also lakes, for example Lake Ngami - is altogether amazing and wonderful. Observations in Namibia indicate that waterbirds must actually “follow rainfronts” in order to settle onto pans as they are filling (Simmons *et al*. 1998). This is a November/December phenomenon, but certainly does not explain how birds might arrive at Lake Ngami when it starts filling in July. Palaearctic migrants can take advantage of this method. The considerable pan systems in Hwange National Park and in northern Botswana are used by nomadic ('resident') waterbirds during the winter and dry seasons by some other search system; perhaps they just "wander randomly" (Simmons *et al*. 1998).

In 1993 an estimate was made of the number of pans in Hwange National Park using the same method as in estimating elephant numbers. Thus in late September no fewer than 33,169 dry pans and 5695 wet pans were estimated (flights took place after unseasonal rain storms over the park), giving a density of 2.6 pans per km^2 (Bowler 1995); unfortunately actual areas of pans could not be estimated. Earlier, and from maps, Godfrey (1992) had estimated 24,243 pans in the park, with a peak density of 5.8 per km^2 in the soutwestern corner. These pans are vital for the successful breeding of waterbirds, in particular ducks, because in being ephemeral they are unlikely to host predators such as mongooses, crocodiles and leguaans.

Many 'resident' waterbirds may in fact undergo much population turnover, which only capturing and ringing could discover. There are very few persons doing such a thing in the Four Corners area.

Finally, there are a few species that move *en masse* and catch us by surprise, for example sunbirds (Borello 1992) and whydahs (Randall *et al.* 1994). Undoubtedly there are more of these species and incidences just awaiting observers to be in the right place at the right time. As yet these occurrences do not fit into a theoretical framework.

It is likely that the intra-African migrants that come south for breeding actually come to the same locality in each year. This is certainly the case for the Carmine Bee-eater which is rather restricted in the suitable sites it can use for breeding, the same being the case for the Rock Pratincole. Probably the same Wahlberg's Eagles also come to the same nest sites each August. This phenomenon of fidelity to a ‘wintering’ or breeding site is known as *ortstreue*, and is well documented with several Palaearctic migrants, though not specifically in the Four Corners area. Of course it is well acknowledged for the Greater and Lesser Flamingos which have only two important breeding localities in southern Africa (Sua and Etosha pans).

7.7 SPECIES ASSEMBLAGES

In his seminal book, Reg Moreau (1966, pp.2-6) emphasised "three basic considerations" when examining avian diversity in Africa. First, there is a "profound dichotomy" between the birds of evergreen forest and those outside, or the non-forest species. Second, most species can be categorised as lowland or montane. And third, he divided the bird fauna into five groups which were "broadly ecological as well as taxonomic". These groups are: (A) waterbirds, (B) raptors including owls, (C) ground birds, (D) remaining non-passerines, now termed near-passerines

(most are vocal species that perch in trees), and (E) passerines or the singing, perching birds. Each group comprised various families of birds. This is a simple and helpful breakdown of the diversity, and each group in any particular locality (lake, national park, QDS, etc.) could be taken as an assemblage. Moreau's whole book is predicated on this approach to faunal analysis, which he pioneered.

The Four Corners area has one patch of dry evergreen forest in the Kafue National Park, otherwise the whole area is non-forest. And there is no montane (which Moreau quotes Keay as putting at above about 1300 m attitude) in the area. I therefore suggest the following as noteworthy assemblages.

Dry evergreen forest: This is the *Cryptosepalum* forest, and its avifauna (Benson & Irwin 1965).

Miombo bird parties: This is the *Brachystegia/Julbernardia* woodland type, with its canopy and general lack of understorey. Benson & Irwin (1966) listed the species by geography and habitat constraints. They considered there to be 23 species endemic to miombo woodland, *sensu strictu,* although M.P.S. Irwin (pers. comm.) has now increased this total to about 30. However within the miombo avifauna itself is the interesting phenomenon of bird 'parties'. This is an assemblage that is more than just an assemblage, it is a foraging group in which species come and go. Bird parties are worthy of study in their own right. In miombo near Lusaka, for example, 40 species could occur in such flocks (Nefdt 1989). In drier miombo near Harare, 65 species could occur in parties (131 recorded), with an average of 17 (range 10-24)(Couto & Jonasi 2000).

Batoka raptors: Downstream of Victoria Falls, the Zambezi River passes though the basalt gorges of Batoka for about 120 km (Childes & Mundy 2001). Stunning cliffs have been formed, virtually the only ones in the whole Four Corners area. It is a 'haven' for raptors, and in this small area of about 120 km^2 no less than 36 species have been identified (Hartley 1993). Other species of interest also occur here, such as Black Stork and Rock Pratincole, if one wanted an overall assemblage.

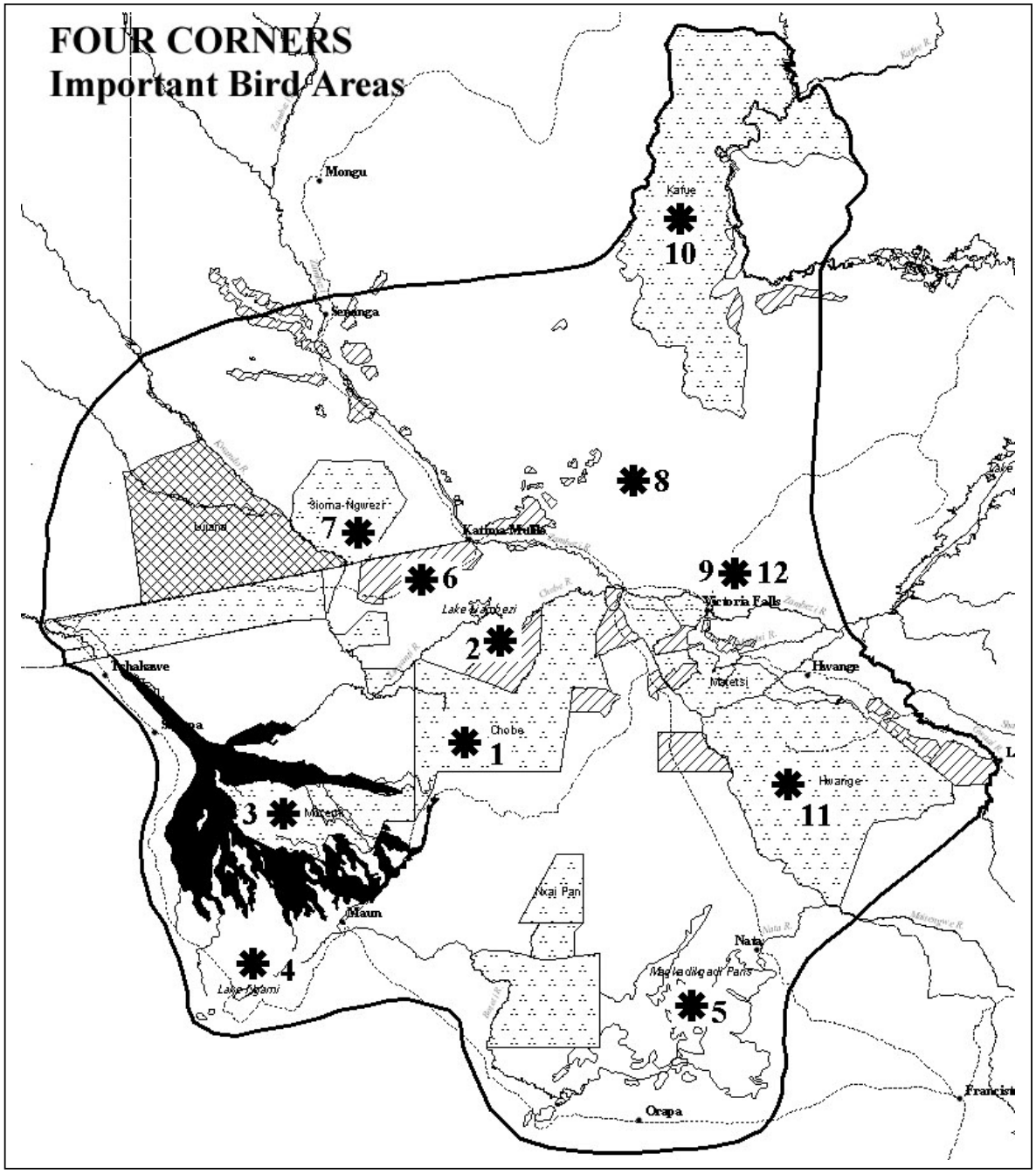
Okavango waterbirds: This inland delta is a Ramsar site and is permanently inundated, albeit fluctuating, unlike the other natural water bodies in the area (e.g. lakes Liambezi, Ngami and Xau). This is said to be the "most important wetland in southern Africa" (Tyler & Bishop 2001), and has a checklist of 450 species of birds, of which at least 97 species (Tyler 2001) are waterbirds. No doubt there are more lurking in the swampy vegetation.

Grassland birds: As noted in an earlier survey (Mundy 2000a) the grasslands of south-central Africa are the richest of their type in the world (M.P.S. Irwin, pers. comm.). These are grasslands on Kalahari sands and may be wet or dry. They are notable for the diversity of larks - Penry (1994) shows 12 species in the area - as well as grass warblers (*Cisticola* spp.) and widow/ whydah birds (*Euplectes* spp.) (see Appendix 7.1). Michael Irwin emphasises (pers. comm.) that not only are the grasslands high in diversity but they are also a 'centre of speciation' with endemic subspecies of Clapper and Pink-billed Larks as two examples.

7.8 IMPORTANT AREAS FOR BIRDS

Known areas of high bird biodiversity have been listed in Table 7.3. As yet no area surpasses 450 species, or three-quarters of that of the whole of the Four Corners. In 1993 BirdLife International began its programme of finding "important bird areas" (IBAs) in Africa (Fishpool & Evans 2001). These were identified on several criteria, none of which was on overall

Figure 7.1 Important bird areas in the Four Corners Transfrontier Area



1	**Chobe National Park**	**7**	**Sioma Ngwezi National Park**
2	**Linyati Swamp**	**8**	**Machile**
3	**Okavango Delta**	**9**	**Mosi-oa-Tunya & Batoka Gorge**
4	**Lake Ngami**	**10**	**Kafue National Park**
5	**Mkgadikgadi Pans**	**11**	**Hwange National Park**
6	**Eastern Caprivi wetlands**	**12**	**Batoka Gorge (Zimbabwe)**

biodiversity. Eventually 12 IBAs were listed in the Four Corners (Table 7.4 and Figure 7.1). In total, they amount to 93,324 km^2, or about one-third of the whole area. A considerable portion of this is formally unprotected, although there are 37 protected areas, amounting to at least 100,000 km^2 . The IBAs form a good basis for conservation areas, albeit being on the large side.

Table 7.4 Important Bird Areas in the Four Corners area, from Fishpool & Evans (2001).

Country		**Area** (km^2)
Angola	none	
Botswana	Chobe National Park	10,698
	Linyati Swamp	200
	Okavango Delta	16,000-22,000
	Lake Ngami	250
	Mkgadikgadi Pans	12,000
Namibia	Eastern Caprivi wetlands	4680
Zambia	Sioma Ngwezi National Park	5276
	Machile	c.3000
	Mosi-oa-Tunya & Batoka Gorge	100
	Kafue National Park	22,400
Zimbabwe	Hwange National Park	14,600
	Batoka Gorge	120

7.9 SPECIES OF CONSERVATION CONCERN

Over the years, BirdLife International (originally ICBP) has produced three Red Data Lists covering Africa (Collar & Stuart 1985, Collar *et al*. 1994, Stattersfield & Capper 2000). From the most recent book, the Four Corners area hosts 17 species, of which three are vagrants (Table 7.5). These are indicated in the checklist. Only eight species occur in all four countries, and some of these will certainly occur in the fifth (southeast Angola). Curiously, there are no passerines. Note that no species is considered to be endangered.

In addition to this global list, each country produces its own list of threatened birds, or at least those species of some conservation concern to it. Those for Botswana are listed by Tyler & Borello (2000), for Namibia by Brown (1998), for Zambia some are noted by Leonard (2001), and for Zimbabwe both state-protected species and vulnerable species are listed by Mundy (2000b). In total, and in addition to the global list of 17 species, a further approximately 90 species that occur in the Four Corners area are thus considered by national authorities to need attention. These are not listed here because they are national concerns rather than trans-boundary, and each nation can have its own reasons for its opinions. However, if we take whether at least three of the countries in the Four Corners area have expressed concern over a species as the criterion, then 13 emerge (Table 7.6). Only one of these is a passerine.

Table 7.5 Globally threatened species present in the Four Corners area, from Stattersfield & Capper (2000)

Species	**SE Ang**	**N Bot**	**Caprivi**	**SW Zam**	**NW Zim**
Vulnerable					
Slaty Egret		X	X	X	X
Lappet-faced Vulture		X	X	X	X
Cape Griffon		V			V
Lesser Kestrel (PM)		X	X	X	X
Wattled Crane		X	X	X	V
Blue Crane		V	V		
Corncrake (PM)				X	X
Black-cheeked Lovebird				X	
Near-Threatened					
Shoebill Stork				V	
Lesser Flamingo		X	V	V	V
Pallid Harrier (PM)		X	V	X	V
Taita Falcon				X	X
Stanley's/Denham's Bustard		X		X	X
Great Snipe (PM)		V		X	V
African Skimmer (AM)		X	X	X	X
Chaplin's Barbet				X	
Data Deficient					
Black-winged Pratincole (PM)		X	X	X	V

NB. PM = Palaearctic migrants, AM = Afrotropical migrants, X = present, V = vagrant

Table 7.6 Species of conservation concern to at least three of the countries in the Four Corners area.

	Botswana	Namibia	Zambia	Zimbabwe
Great Crested Grebe	X	X	X	
White Pelican	X	X		X
Pink-backed Pelican	X	X		X
White-backed Night Heron	X	X		X
Bittern	X	X	X	
Greater Flamingo	X	X		X
Hooded Vulture	X	X		X
White-headed Vulture	X	X		X
Bateleur Eagle	X	X	X	X
Crowned Crane	X	X		X
Rock Pratincole	X	X		X
Ground Hornbill	X	X		X
Yellow-billed Oxpecker		X	X	X

Sua Pan, although already noted as an IBA (Tyler & Bishop 2001), should again be emphasised here. It is one of the only two important breeding areas for Greater and Lesser Flamingos in the whole of southern Africa. In addition, the Nata delta at the north end of the pan is an important breeding site for White Pelicans. For the three species (all of which are of national or global concern), successful breeding depends on rainfall and water levels, and therefore occurs 'sporadically' (Tyler & Bishop 2001) over the years.

Some species are marginal or even vagrant to a country while having their stronghold perhaps in the neighbouring state. Wattled Crane is one such example, being very marginal in northwest Zimbabwe. Here is where a transfrontier approach can be the most useful. Even from the 17 species in Table 7.5, some birds can hardly be helped, as they are vagrants to the whole area (Cape Griffon, Shoebill Stork, Blue Crane), while others are Palaearctic migrants and always on the move (Lesser Kestrel, Corncrake, Pallid Harrier, Great Snipe, Black-winged Pratincole). Of the nine species now remaining, the important ones (in my opinion) to be concerned about are:

- Slaty Egret (virtually endemic to the Four Corners and centred on the Okavango Delta),
- Wattled Crane (large populations in the area),
- Lesser Flamingo (important breeding site at Sua Pan),
- Black-cheeked Lovebird (endemic in southwest Zambia),
- Taita Falcon (African rarity),
- African Skimmer (needs pristine river flow, and sandbanks).

The remaining three species cannot be seriously considered. The Lappet-faced Vulture is very widespread in Africa, and indeed is at its most abundant in southern Africa. The Stanley's (Denham's) Bustard is a denizen of higher rainfall areas to the north, and is marginal in the Four Corners. And the Chaplin's Barbet is endemic to southern Zambia but mostly to the east of the designated area.

Finally, the four Corners area hosts a population of he Brown-throated Weaver and a so-called "black-headed" form of the Thick-billed Weaver (Hall & Moreau 1970), both of which are well separated from their con-specifics. This zoogeography makes them worthy of attention, and maybe even of conservation concern.

7.10 GLOBAL CLIMATE CHANGE

Since independence in Zimbabwe in 1980 there have been eight bad droughts, defined as a rainy season with less than about 70% of the national average. Cyclones seem to occur regularly (for example, Cyclone Demoina in 1984). These are possibly tangible impacts of global warming - on the one hand severe droughts, on the other floods from cyclones. In southern Africa as a whole, climatic warming is being experienced (about 0.5^{o}C during the 20th century), and also a "trend towards reduced rainfall" in the last 20 years (Hulme 1996).

So what's in it for the birds? At least two obvious impacts. First, freshwater bodies will dry up with a direct impact on waterbirds. Lake Liambezi in the Caprivi, for example, dried up in 1989 and has not filled up since then (Bethune 1998). Similarly Lake Ngami was dry for seven years prior to 1989, and little water has reached it since (Tyler & Bishop 2001). Second, and indirectly, vegetation at ground level will suffer and desertification result. All the ground birds (Moreau's group C) and many more besides, including the raptors that prey on them, must surely decline. At least two other effects of global warming are likely to mimic those already measured in the northern hemisphere. These are an advance in birds' breeding seasons, and a change in the arrival of migrants to the region - both due to warmer winters. Palaearctic migrants are likely to arrive later, whereas Afrotropical migrants may arrive sooner.

7.11 TRANSFRONTIER APPROACH

All but one of the key species listed above cross national frontiers frequently. Therefore they need to be tracked and monitored throughout the whole Four Corners area. However, most ornithologists are probably rather state-bound, locked in by our national borders in a way that many bird watchers are not. The trans-frontier project could set up a central database to receive all counts and sightings of species of interest from anywhere in the area. However, there will still be a need for someone to track and monitor the database. It worked well during the southern African bird atlas project (SABAP), albeit with some hierarchy and not enough vetting

At the moment we have the situation where for the Wattled Crane (at least) two outside agencies are pushing along the conservation work, both specialist crane agencies. They already work across boundaries very freely, in a way that we should be copying for ourselves in the Four Corners area. Standardisation of methods, simultaneous counting (as in the recent flamingo survey), searching for marked birds, and capturing and ringing birds in a coordinated fashion, all would show the benefit of a trans-frontier approach. This approach could certainly be seen as yet another method or tool in our work for the conservation of birds.

7.12 MONITORING

Much monitoring in the form of identifying species, counting them, documenting the results and shaping of databases is already ongoing, at least in Namibia and Zimbabwe. Lesser amounts are done in Botswana and Zambia. Not only should the efforts be more rigorously and vigorously pursued, but efforts also be made to join forces regionally. There are no limitations to this - field guides, bird clubs, computers, English as the language, all these ingredients are in place. What are in very short supply are the analysts of the data.

But what should be monitored and why?

In the first instance, waterbirds and vulnerable species should be the targets. Both projects need careful national planning, and some effort at regional liaison as happened with the recent flamingo census. An army of bird watchers is needed for both, but the project on vulnerable species will require more analysts, which are in very short supply. We need to move from the spot-and-plot way of thinking to that of threats-and-actions. In this regard the way in which local bird clubs are linking up with BirdLife International - which is the main driver of new projects, supported by the RSPB - is excellent, as capacity building, information transfer and global concern are easily facilitated along this route.

Visits to likely areas are necessary, and counts of each species should be made. Where possible, birds should be categorised to age and sex, and any breeding performance noted. This approach was taken in Zimbabwe with some waterbird counts (Mundy *et al*. 2000). A thinking approach is required, not just going off to local and convenient localities. Some species must be searched for in the greater environment. Among the six important species listed above, Slaty Egret, Taita Falcon and Black-cheeked Lovebird are not conspicuous birds and are examples of this principle. Regretfully, all these species of conservation concern are as yet noticed only on what seems like an *ad hoc* basis, except for Lesser Flamingo, Wattled Crane and Taita Falcon which are subject to planned surveys and of a regional nature. By contrast, the African waterbird census has succeeded in getting a lot of bird watchers counting at a lot of sites, though there is not much in the way of national planning in any of the countries.

All of the above should actually be contingent upon asking questions (i.e. suggesting hypotheses) of the species themselves. If the birds are of conservation concern it is because one or more threats are perceived as having an impact upon them. The two main threats are the variations in water supply due to fluctuations in rainfall, and human disturbance, including from tourists. This latter is particularly the case downstream of the Victoria Falls and in the Okavango Delta and panhandle. On the other hand, the safari guides themselves should be acting as data collectors, and with help and training some of them might even become analysts.

In the second instance, species that are not of conservation concern need not be monitored, and this dictum applies to most species in the region. Unfortunately one can rarely know in advance which species are likely to suffer impacts and therefore should be monitored. So some sort of 'shotgun' approach is needed, where observers simply keep a tally of what they see and hear (e.g. Hustler 1995) until a change is noticed, then focus is brought to bear.

7.13 ACKNOWLEDGEMENTS

This review has benefited from Michael Irwin's knowledge of the area, and also from comments by Sue Childes and Jonathan Timberlake.

7.14 REFERENCES

Anon. (1997). Comprehensive local bird list for 20 km radius of Nata Lodge Botswana. Pamphlet printed for clients. Nata Lodge, Botswana.

Anon. (1999). *A Wilderness Travellers Guide to Northern Botswana*. Wilderness Safaris, Halfway House South Africa.

Aspinwall, D. & Beel, C. (1998). *A Field Guide to Zambian Birds not found in Southern Africa.* Zambian Ornithological Society, Lusaka.

Barnard, P. [editor] (1998). *Biological Diversity in Namibia - a country study*. Namibian National Biodiversity Task Force, Directorate of Environmental Affairs, Windhoek.

Benson, C.W., Brooke, R.K., Dowsett, R.J. & Irwin, M.P.S. (1971). *The Birds of Zambia.* Collins, London.

Benson, C.W. & Irwin, M.P.S. (1965) The birds of *Cryptosepalum* forests, Zambia. *Arnoldia* (*Rhodesia*) **1**(28).

Benson, C.W. & Irwin, M.P.S. (1966). The *Brachystegia* avifauna. *Ostrich Suppl*. **6**: 297-321.

Benson, C.W. & Irwin, M.P.S. (1967). A contribution to the ornithology of Zambia. *Zambia Museum Papers* No.1.

Bethune, S. (1998). Wetland habitats. In: *Biological Diversity in Namibia - a country study* (edited by P. Barnard), pp. 60-66. Namibian National Biodiversity Task Force, Directorate of Environmental Affairs, Windhoek.

Bibby, C.J., Collar, N.J., Crosby, M.J., Heath, M.F., Imboden, C., Johnson, T.H., Long, A.J., Stattersfield, A.J. & Thirgood, S.J. (1992). *Putting Biodiversity on the Map: priority areas for global conservation.* ICBP, Cambridge.

Borello, W.D. (1992). An incidence of mass sunbird migration in northern Botswana. *Babbler* **23**: 18-21.

Borello, W.D. & Borello, R.M. (1997). *Birds of Botswana: an annotated working bibliography 1835-1995*. Russel Friedman Books, Halfway House, South Africa.

Borello, W.D., Mundy, P.J. & Liversedge, T.N. (1998). Movements of Greater and Lesser Flamingos in southern Africa. *Torgos* **28**: 201-218.

Bowler, M. (1995). The aerial census of elephant and other large mammals including data on pans in Hwange National Park. Unpublished report. Dept. National Parks, Harare.

Branfield, A. (1990). New bird records for the east Caprivi, Namibia. *Lanioturdus* **25**: 4-21.

Brooke, R.K. (1966). A preliminary list of the birds of the Kafue National Park. *Puku* **4**: 57- 86.

Brown, C.J. (1985). The status and conservation of the Cape Vulture in SWA/Namibia. *Vulture News* **14**: 4-15.

Brown, C.J. (1990). Birds of the west Caprivi Strip, Namibia. *Lanioturdus* **25**: 22-37.

Brown, C.J. (1998). Threatened Namibian birds. In: *Biological Diversity in Namibia - a country study* (edited by P. Barnard), p. 324. Namibian National Biodiversity Task Force, Directorate of Environmental Affairs, Windhoek.

Brown, C.J., Jarvis, A., Robertson, T. & Simmons, R. (1998). Bird diversity. In: *Biological Diversity in Namibia - a country study* (edited by P. Barnard), pp. 155-163. Namibian National Biodiversity Task Force, Directorate of Environmental Affairs, Windhoek.

Brown, L.H., Urban, E.K. & Newman, K. (1982). *The Birds of Africa*. Vol. I. Academic Press, London.

Carbone, F. (2003). Little Ringed Plover in Hwange National Park: a first for southern Africa. *Honeyguide* **49**: 76-77.

Childes, S.L. & Mundy, P.J. (2001). Zimbabwe. In: *Important Bird Areas in Africa and Associated Islands. Priority Sites for Conservation.* (edited by L.D.C. Fishpool & M.I. Evans), pp. 1025-1042. BirdLife International & Pisces Publications, Cambridge.

Clancey, P.A. (1980). On birds from the mid-Okavango valley on the South West Africa/Angola border. *Durban Museum Novitates* **12**: 87-127.

Cohen, C. (1997). Ross's Lourie. In: *The Atlas of Southern African Birds*, Volume 1 (edited by J.A. Harrison *et al*.), p. 775. BirdLife South Africa, Johannesburg.

Collar, N.J., Crosby, M.J. & Stattersfield, A.J. (1994). *Birds to Watch 2*. BirdLife International, Cambridge.

Collar, N.J. & Stuart, S.N. (1985). *Threatened Birds of Africa and Related Islands*. ICBP & IUCN, Cambridge & Gland.

Couto, J.T. & Jonasi, G. (2000). Bird parties in the miombo woodland around Lake Chivero. *Honeyguide* **46**: 138.

Cramp, S. & Perrins, C.M. [editors] (1994). *Handbook of the Birds of Europe, the Middle East and North Africa*. *The Birds of the western Palearctic*. Vol. IX. Oxford University Press, Oxford.

Cramp, S. & Simmons, K.E.L. [editors] (1977). *Handbook of the Birds of Europe, the Middle East and North Africa. The Birds of the western Palearctic.* Vol. I. Oxford University Press, Oxford.

Cumming, D.H.M., Fenton, M.B., Rautenbach, I.L., Taylor, R.D., Cumming, G.S., Cumming, M.S., Dunlop, J.M., Ford, A.G., Hovorka, M.D., Johnston, D.S., Kalcounis, M., Mahlangu, Z. & Portfors, C.V.R. (1997). Elephants, woodlands and biodiversity in southern Africa. *South African Journal of Science* **93**: 231-236.

Davies, M. (2000). Action Plans for Conservation of Globally Threatened Birds in Africa. Unpublished project document. RSPB, Sandy, UK.

Davison, E. (1963). Check list of birds of Wankie National Park. *South African Avifauna Series* No. 13.

Dean, W.R.J. (2000). *The Birds of Angola. An annotated checklist.* British Ornithologists' Union, Tring, UK.

Dodman, T. & Diagana, C.H. (2003). *African Waterbird Census 1999, 2000 & 2001*. Wetlands International, Wageningen.

Douthwaite, R.J. (1982). Food and feeding behaviour of the Little Bee-eater *Merops pusillus* in relation to tsetse fly control by insecticides. *Biological Conservation* **23**: 71-78.

Dowsett, R.J. & Dowsett-Lemaire, F. [editors] (1993). A contribution to the distribution and taxonomy of Afrotropical and Malagasy birds. *Tauraco Research Report* No. 5.

Dowsett, R.J. (1990). The birds. In: *Mosi-oa-Tunya: a handbook to the Victoria Falls region* (edited by D.W. Phillipson), pp. 147-170. Second edition. Longman Zimbabwe, Harare.

Dowsett, R.J. & Forbes-Watson, A.D. (1993). *Checklist of Birds of the Afrotropical and Malagasy Regions*. Tauraco Press, Liege.

Fishpool, L.D.C. & Evans, M.I. [editors] (2001). *Important Bird Areas in Africa and Associated Islands. Priority Sites for Conservation.* BirdLife International & Pisces Publications, Cambridge.

Fraser, W. (1971). Birds recorded in the Moremi Wildlife Reserve, Botswana. *South African Avifauna Series* No. 75.

Fry, C.H., Keith, S. & Urban, E.K. [editors] (1988). *The Birds of Africa*. Vol. III. Academic Press, London.

Fry, C.H. Keith, S. & Urban, E.K. [editors] (2000). *The Birds of Africa.* Vol. VI. Academic Press, London.

Ginn, P.J., McIlleron, W.G. & Milstein, P. le S. [editors] (1989). *The Complete Book of Southern African Birds*. Struik Winchester, Cape Town.

Godfrey, J.W. (1992). Natural pans - the duck factories of Zimbabwe. *Honeyguide* **38**: 165-172.

Hall, B.P. & Moreau, R.E. (1970). *An Atlas of Speciation in African Passerine Birds.* Trustees of British Museum (Natural History), London.

Hartley, R. (1993). The Batoka Gorges haven for birds of prey. *African Wildlife* **47**: 74-78.

Harrison, J.A., Allan, D.G., Underhill, L.G., Herremans, M., Tree, A.J., Parker, V. & Brown, C.J. [editors] (1997). *The Atlas of Southern African Birds.* 2 volumes. BirdLife South Africa, Johannesburg.

Herremans, M. (1994). Fifteen years of migrant phenology records in Botswana. A summary and prospects. *Babbler* **28**: 47-68.

Herremans, M. (1995). Effects of woodland modification by African elephant *Loxodonta africana* on bird diversity in northern Botswana. *Ecography* **18**: 440-454.

Hoesch, W. & Niethammer, G. (1940). Die Vogelwelt Deutsch-Südwest-afrikas. *Journal f. Ornithologie* **88**.

Hulme, M. (1996). *Climate Change and Southern Africa*: *an exploration of some potential impacts and implications for the SADC region*. Climatic Research Unit, University of East Anglia, Norwich.

Hustler, C.W. (1995) Avifauna. In: SAVSKILL: a methodology to measure and monitor biodiversity in central African savannas (edited by F.P.D. Cotterill), p.71. *Occasional Publications in Biodiversity* No. 1. BFA, Bulawayo.

Hustler, K. (1986). A revised checklist of the birds of Hwange National Park. *Honeyguide* **32**: 68-87.

Irwin, M.P.S. (1978). A bibliography of the birds of Rhodesia 1873-1977. Rhodesian Ornithological Society, Salisbury.

Irwin, M.P.S. (1981). *The Birds of Zimbabwe*. Quest Publishing, Salisbury.

Irwin, M.P.S., Niven, P.N.F. & Winterbottom, J.M. (1969). Some birds of the lower Chobe River area, Botswana. *Arnoldia Rhodesia* **4**(21).

James, H.W. (1970). *Catalogue of the birds eggs in the collection of the National Museums of Rhodesia*. Trustees of National Museums of Rhodesia, Salisbury.

Jensen, R.A.C. (1966). The birds of the Victoria Falls National Park, Rhodesia. *South African Avifauna Series* No. 33.

Keith, S., Urban, E.K. & Fry, C.H. [editors] (1992). *The Birds of Africa*. Vol. IV. Academic Press, London.

Kemp, A.C. (1971). Observations on birds of the eastern Caprivi Strip. *Bulletin Transvaal Museum* [not seen].

Koen, J.H. (1988). Birds of the eastern Caprivi. *Southern Birds* No. 15.

Ledger, J. (1980). Vultures poisoned in Caprivi. *Vulture News* **3**: 15.

Ledger, J. (1985). Say a prayer for Paradise: the Okavango Delta. *African Wildlife* **39**: 12-18.

Leonard, P.M. (2001). Zambia. In: *Important Bird Areas in Africa and Associated Islands. Priority Sites for Conservation* (edited by L.D.C. Fishpool & M.I.Evans), pp. 1005-1024. BirdLife International & Pisces Publications, Cambridge.

Leonard, P. & Peters, W. [editors] (1999). *1998 Zambia bird report*. Zambian Ornithological Society, Lusaka.

Liversedge, T. (1990). Report on the mortality of non-target species during spraying of quelea by the Ministry of Agriculture Plant Protection Unit in the Komana area of Ngamiland. March/April 1990. Unpublished report. Kalahari Conservation Society, Gaborone.

Mackworth-Praed, C.W. & Grant, C.H.B. (1952 & 1955). *Birds of Eastern and North-eastern Africa.* Series I (vols. I & II). Longmans Green, London.

Mackworth-Praed, C.W. & Grant, C.H.B. (1962 & 1963). *Birds of the Southern Third of Africa.* Series II (vols. I & II). Longmans, London.

Mackworth-Praed, C.W. & Grant, C.H.B. (1970 & 1973). *Birds of West Central and Western Africa.* Series III (vols. I & II). Longman, London.

Maclean, G.L. (1993). *Roberts' Birds of Southern Africa*, 6th edition. Trustees of John Voelcker Bird Book Fund, Cape Town.

Mearns, B. & Mearns, R. (1998). *The Bird Collectors*. Academic Press, San Diego.

Mendelsohn, J., Jarvis, A., Roberts, C. & Robertson, T. (2002). *Atlas of Namibia*. David Philips, Cape Town.

Moreau, R.E. (1966). *The Bird Faunas of Africa and its Islands*. Academic Press, London.

Moreau, R.E. (1972). *The Palaearctic-African Bird Migration Systems* Academic Press, London.

Mundy, P. (2000a). Wetland birds of the Zambezi basin. In: *Biodiversity of the Zambezi Basin Wetlands* (edited by J. Timberlake), pp. 213-278. Biodiversity Foundation for Africa, Bulawayo/ Zambezi Society, Harare.

Mundy, P.J. (2000b). A strategy for ornithology within the Department of National Parks. *Honeyguide* **46**: 82-100.

Mundy, P.J. & Borello, W.D. (1990). *Northeast section of Sowa Pan (Makgadikgadi Pans). Bird survey in winter 1990, with proposals for future monitoring*. Botswana Bird Club Report No. 1.

Mundy, P.J., Chiweshe, N.C. & Couto, J.T. (2000). Waterfowl counts at Mbazhe Pan. *Honeyguide* **46**: 148-150.

Nefdt, R.J.C. (1989). A study of some bird parties in Zambia. *Ostrich suppl*. **14**: 27-32.

Newman, K. (1989). *Birds of Botswana*. Southern Book Publishers, Johannesburg.

Newman, K. (1996). *Newman's Birds of Southern Africa*, 5th edition. Southern Book Publishers, Halfway House.

Penry, E.H. (1994). *Bird Atlas of Botswana*. University of Natal Press, Pietermaritzburg.

Penry, E.H. & Tarboton, W.R. (1990). Redwinged Praticoles breeding at Lake Ngami. *Babbler* **19**: 7-11.

Perennou, C. (1991). *African waterfowl census 1991.* International Waterfowl & Wetlands Research Bureau, Slimbridge, UK.

Pinto, A.A. da Rosa (1983). *Ornitologia de Angola*. Vol. 1. Instituto de Investigação Cientifica. Tropical, Lisbon.

Pollard, C.J.W. (n.d.). A checklist of the birds of Victoria Falls. Ornithological Association of Zimbabwe, Harare.

Priest, C.D. (1929). *A Guide to the Birds of Southern Rhodesia*. Clowes & Sons, London.

Priest, C.D. (1933-36). *The Birds of Southern Rhodesia*, 4 vols. Clowes & Sons, Edinburgh.

Randall, R., Herremans, M. & Herremans-Tonnoeyr, D. (1994). Massive influx of Broadtailed Paradise Whydahs *Vidua obtusa* in far north-eastern Botswana in 1994. *Babbler* **28**: 18-20.

Roberts, A. (1940). *The Birds of South Africa*. Trustees of South African Bird Book Fund, London.

Robertson, A. & Jarvis, A.M. (1999). *The Namibian Avifaunal Database user manual*. Directorate Environmental Affairs, Windhoek.

Seely, M. (1998). Environmental degradation. In: *Biological Diversity in Namibia - a country study* (edited by P. Barnard), pp. 70-71. Namibian National Biodiversity Task Force, Directorate of Environmental Affairs, Windhoek.

Simmons, R.E. (1996). Population declines, viable breeding areas, and management options for flamingos in southern Africa. *Cons. Biol.* **10**: 504-514.

Simmons, R.E., Barnard, P. & Jamieson, I.G. (1998). What precipitates influxes of wetland birds to ephemeral pans in arid landscapes? Observations from Namibia. *Ostrich* **70**: 145 – 148.

Sinclair, I., Hockey, P. & Tarboton, W. (1997). *Sasol Birds of Southern Africa*, 2nd edition. Struik New Holland, Cape Town.

Sinclair, J.C. & Sinclair, J. (1995). *Birds of Namibia: a photographic guide*. Struik, Cape Town.

Smithers, R.H.N. (1964). *A check list of the birds of the Bechuanaland Protectorate and the Caprivi Strip with data on ecology and breeding.* Trustees of National Museums Southern Rhodesia, Salisbury.

Smithers, R.H.N., Irwin, M.P.S. & Paterson, M.L. (1957). *A check list of the birds of Southern Rhodesia*. Rhodesian Ornithological Society, Salisbury.

Snow, D.W. [editor] (1978). *An Atlas of Speciation in African Non-passerine Birds*. Trustees of British Museum (Natural History), London.

Stattersfield, A.J. & Capper, D.R. [editors] (2000). *Threatened Birds of the World*. BirdLife International & Lynx Edicions, Cambridge & Barcelona..

Stattersfield, A.J., Crosby, M.J., Long, A.J. & Wege, D.C. (1998). *Endemic Bird Areas of the World: priorities for biodiversity conservation*. BirdLife International, Cambridge.

Swanepoel, C.M. & Swanepoel, S.M. (1986). Baobab damage by elephant in the middle Zambezi Valley, Zimbabwe. *African Journal of Ecology* **24**: 129-132.

Steyn, P. (1974). *Wankie Birds*. Longman Rhodesia, Salisbury.

Tiffen, M. & Mulele, M.R. (1994*). The environmental impact of the 1991-92 drought in Zambia*. IUCN, Gland.

Tinley, K.L. (1966). Western Caprivi conservation area, South West Africa: a proposal of natural resource land use. Internal unpublished report, Directorate Nature Conservation, Windhoek.[not seen].

Tinley, K.L. (1973). *An ecological reconnaissance of the Moremi Wildlife Reserve, northern Okovango swamps, Botswana*. Okovango Wildlife Society, Johannesburg.

Traylor, M.A. (1963). Check-list of Angolan Birds. *Publicaçoes Culturais de Compania de Diamantes de Angola* **61**: 1-250.

Tree, A.J. (2003). Movements of the Treble-banded Plover within and through Zimbabwe, with observations from elsewhere in southern Africa. *Honeyguide* **49**: 50-61.

Tyler, S.J. (2001). A review of waterbird counts in Botswana, 1991-2000. *Babbler, Special Suppl.* No. 1.

Tyler, S.J. & Bishop, D.R. (2001). Botswana. In: *Important Bird Areas in Africa and Associated Islands. Priority Sites for Conservation* (edited by L.D.C. Fishpool & M.I.Evans), pp. 99-112. BirdLife International & Pisces Publications, Cambridge.

Tyler, S.J. & Borello, W.D. (2000). The red data list of birds in Botswana. *Babbler* **37**: 42-45.

Urban, E.K., Fry, C.H. & Keith, S. [editors] (1986). *The Birds of Africa.* Vol. II. Academic Press, London.

Urban, E.K., Fry, C.H. & Keith, S. [editors] (1997). *The Birds of Africa*. Vol. V. Academic Press, London.

Van Perlo, B. (1999) *Birds of Southern Africa*. Harper Collins, London.

White, C.M.N. (1965). *A revised checklist of African non-passerine birds*. Government Printer, Lusaka.

White, F. (1983). *The Vegetation of Africa: a descriptive memoir to accompany the UNESCO/AETFAT/UNSO vegetation map*. Natural Resources Research 20. UNESCO, Paris.

Williams, A.J. (n.d.). *Popular checklist of the birds of South West Africa/Namibia*. Dept. Agriculture & Nature Conservation, Windhoek.

Williams, J.G. & Arlott, N. (1980). *A Field Guide to the Birds of East Africa.* Collins, London.

Winterbottom, J.M. (1965). A preliminary list of the birds of South West Africa. *South African Avifauna Series* No. 25.

Winterbottom, J.M. (1971). *A preliminary check list of the birds of South West Africa*. S.W.A. Scientific Society, Windhoek.

Appendix 7.1 List of birds present in the Four Corners area, by country.

Key: x = present; Status: blank space = breeding resident; iam = intra-African migrant; pm = palaearctic migrant; v = vagrant (to the Four Corners area); VU = Vulnerable; NT = Near Threatened; DD = Data Deficient.

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
Family STRUTHIONIDAE: Ostrich								
Struthio camelus	Ostrich	x	x		x			
PODICIPEDIDAE: Grebes								
Tachybaptus ruficollis	Dabchick	x	x	x	x	x		
Podiceps cristatus	Great Crested Grebe		x	x				
Podiceps nigricollis	Black-necked Grebe	x						
PELECANIDAE: Pelicans								
Pelecanus onocrotalus	White Pelican	x	x	x	x	x		
Pelecanus rufescens	Pink-backed Pelican	x	x	x	x	x		
PHALACROCORACIDAE: Cormorants								
Phalacrocorax carbo	White-breasted Cormorant	x	x	x	x			
Phalacrocorax africanus	Reed Cormorant	x	x	x	x	x		
ANHINGIDAE: Darters								
Anhinga melanogaster	Darter	x	x	x	x	x		
ARDEIDAE: Herons, Egrets and Bitterns								
Ardea cinerea	Grey Heron	x	x	x	x			
Ardea melanocephala	Black-headed Heron	x	x	x	x	x		
Ardea goliath	Goliath Heron	x	x	x	x			
Ardea purpurea	Purple Heron	x	x	x	x			
Egretta alba	Great White Heron	x	x	x	x			
Egretta intermedia	Yellow-billed Egret	x	x	x	x			
Egretta garzetta	Little Egret	x	x	x	x			
Egretta ardesiaca	Black Egret	x	x	x	x			
Egretta vinaceigula	Slaty Egret	x	x	x	x			VU
Bubulcus ibis	Cattle Egret	x	x	x	x			
Ardeola ralloides	Squacco Heron	x	x	x	x			
Gorsachius leuconotus	White-backed Night Heron	x	x	x	x	x		
Nycticorax nycticorax	Black-crowned Night Heron	x	x	x	x			
Butorides striatus	Green-backed Heron	x	x	x	x	x		
Butorides rufiventris	Rufous-bellied Heron	x	x	x	x	x		
Ixobrychus sturmii	Dwarf Bittern	x	x	x	x	x	iam	
Ixobrychus minutus	Little Bittern	x	x	x	x	x		
Botaurus stellaris	Bittern	x	x	x				
SCOPIDAE: Hamerkop								
Scopus umbretta	Hamerkop	x	x	x	x	x		

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
BALAENICIPITIDAE: Shoebill								
Balaeniceps rex	Shoebill			x			v	NT
CICONIIDAE: Storks								
Ciconia ciconia	White Stork	x	x	x	x		pm	
Ciconia abdimii	Abdim's Stork	x	x	x	x	x	iam	
Ciconia nigra	Black Stork	x	x	x	x			
Ciconia episcopus	Woolly-necked Stork	x	x	x	x			
Anastomus lamelligerus	Open-billed Stork	x	x	x	x			
Ephippiorhynchus senegalensis	Saddle-billed Stork	x	x	x	x			
Leptoptilos crumeniferus	Marabou Stork	x	x	x	x	x		
Mycteria ibis	Yellow-billed Stork	x	x	x	x			
PLATALEIDAE: Ibises and Spoonbills								
Threskiornis aethiopicus	Sacred Ibis	x	x	x	x			
Plegadis falcinellus	Glossy Ibis	x	x	x	x			
Bostrychia hagedash	Hadeda Ibis	x	x	x	x	x		
Platalea alba	African Spoonbill	x	x	x	x			
PHOENICOPTERIDAE: Flamingos								
Phoenicopterus ruber	Greater Flamingo	x		x	x			
Phoeniconaias minor	Lesser Flamingo	x	x	x	x			NT
ANATIDAE: Ducks and geese								
Dendrocygna viduata	White-faced Duck	x	x	x	x			
Dendrocygna bicolor	Fulvous Duck	x	x	x	x	x		
Thalassornis leuconotus	White-backed Duck	x	x	x	x	x		
Alopochen aegyptiacus	Egyptian Goose	x	x	x	x	x		
Anas undulata	Yellow-billed Duck	x	x	x	x			
Anas sparsa	African Black Duck			x	x			
Anas capensis	Cape Teal	x	x					
Anas hottentota	Hottentot Teal	x	x	x	x			
Anas erythrorhyncha	Red-billed Teal	x	x	x	x			
Anas smithii	Cape Shoveller	x	x	x				
Netta erythrophthalma	Southern Pochard	x	x	x	x			
Sarkidiornis melanotos	Knob-billed Duck	x	x	x	x	x		
Nettapus auritus	Pygmy Goose	x	x	x	x	x		
Plectropterus gambensis	Spur-winged Goose	x	x	x	x			
Oxyura maccoa	Maccoa Duck	x			x			
SAGITTARIIDAE: Secretarybird								
Sagittarius serpentarius	Secretarybird	x	x	x	x	x		
ACCIPITRIDAE: Vultures, Kites, Hawks, Eagles, Buzzards and Harriers								

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
Neophron percnopterus	Egyptian Vulture	x			x		v	
Necrosyrtes monachus	Hooded Vulture	x	x	x	x			
Gyps coprotheres	Cape Griffon	x		x	x		v	VU
Gyps africanus	White-backed Vulture	x	x	x	x	x		
Torgos tracheliotos	Lappet-faced Vulture	x	x	x	x	x		VU
Trigonoceps occipitalis	White-headed Vulture	x	x	x	x	x		
Milvus migrans parasitus	Yellow-billed Kite	x	x	x	x	x	iam	
Milvus migrans migrans	Black Kite	x	x	x	x		pm	
Elanus caeruleus	Black-shouldered Kite	x	x	x	x			
Aviceda cuculoides	Cuckoo Hawk	x	x	x	x			
Macheiramphus alcinus	Bat Hawk	x	x	x	x			
Pernis apivorus	Honey Buzzard	x	x	x	x		pm/v	
Aquila verreauxii	Black Eagle			x	x			
Aquila rapax	Tawny Eagle	x	x	x	x			
Aquila nipalensis	Steppe Eagle	x	x	x	x		pm	
Aquila pomarina	Lesser Spotted Eagle	x	x	x	x	x	pm	
Aquila wahlbergi	Wahlberg's Eagle	x	x	x	x	x	iam	
Hieraaetus pennatus	Booted Eagle	x	x	x	x		iam/pm	
Hieraaetus ayresii	Ayres' Eagle	x	x	x	x	x		
Hieraaetus spilogaster	African Hawk Eagle	x	x	x	x			
Lophaetus occipitalis	Long-crested Eagle	x	x	x	x	x		
Polemaetus bellicosus	Martial Eagle	x	x	x	x	x		
Stephanoaetus coronatus	Crowned Eagle			x	x			
Circaetus cinereus	Brown Snake Eagle	x	x	x	x			
Circaetus pectoralis	Black-breasted Snake Eagle	x	x	x	x	x		
Circaetus cinerascens	Western Banded Snake Eagle	x	x	x	x	x		
Terathopius ecaudatus	Bateleur	x	x	x	x			
Gypohierax angolensis	Palm-nut Vulture	x	x				v	
Haliaeetus vocifer	African Fish Eagle	x	x	x	x	x		
Buteo buteo vulpinus	Steppe Buzzard	x	x	x	x	x	pm	
Buteo augur	Augur Buzzard			x	x			
Kaupifalco monogrammicus	Lizard Buzzard	x	x	x	x	x		
Accipiter ovampensis	Ovambo Sparrowhawk	x	x	x	x	x		
Accipiter minullus	Little Sparrowhawk	x	x	x	x	x		
Accipiter melanoleucus	Black Sparrowhawk	x	x		x			
Accipiter badius	Little Banded Goshawk	x	x	x	x	x		
Accipiter tachiro	African Goshawk	x	x	x	x	x		
Micronisus gabar	Gabar Goshawk	x	x	x	x	x		
Melierax canorus	Pale Chanting Goshawk	x	x		x			
Melierax metabates	Dark Chanting Goshawk	x	x	x	x	x		
Circus ranivorus	African Marsh Harrier	x	x	x	x			

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
Circus aeruginosus	European Marsh Harrier	x			x		pm	
Circus pygargus	Montagu's Harrier	x		x	x		pm	
Circus macrourus	Pallid Harrier	x	x	x	x		pm	NT
Polyboroides typus	Gymnogene	x	x	x	x	x		
PANDIONIDAE: Osprey								
Pandion haliaetus	Osprey	x	x	x	x		pm	
FALCONIDAE: Falcons and Kestrels								
Falco biarmicus	Lanner Falcon	x	x	x	x			
Falco peregrinus	Peregrine Falcon	x	x	x	x			
Falco subbuteo	Hobby Falcon	x	x	x	x		pm	
Falco cuvierii	African Hobby Falcon	x	x	x	x	x	iam	
Falco fasciinucha	Taita Falcon			x	x			NT
Falco eleonorae	Eleonora's Falcon			x			pm/v	
Falco chicquera	Red-necked Falcon	x	x	x	x			
Falco vespertinus	Western Red-footed Kestrel	x	x	x	x	x	pm	
Falco amurensis	Eastern Red-footed Kestrel	x	x	x	x		pm	
Falco tinnunculus	Rock Kestrel	x		x	x			
Falco rupicoloides	Greater Kestrel	x	x	x	x			
Falco naumanni	Lesser Kestrel	x	x	x	x		pm	VU
Falco dickinsoni	Dickinson's Kestrel	x	x	x	x	x		
PHASIANIDAE: Francolins and Quails								
Francolinus coqui	Coqui Francolin	x	x	x	x	x		
Francolinus sephaena	Crested Francolin	x	x	x	x	x		
Francolinus shelleyi	Shelley's Francolin	x		x	x			
Francolinus levaillantoides	Orange River Francolin	x	x					
Francolinus adspersus	Red-billed Francolin	x	x	x	x	x		
Francolinus natalensis	Natal Francolin	x		x	x			
Francolinus swainsonii	Swainson's Francolin	x	x	x	x	x		
Francolinus afer	Red-necked Francolin			x		x		
Coturnix coturnix	Common Quail	x	x				iam	
Coturnix delegorguei	Harlequin Quail	x	x	x	x		iam	
Coturnix adansonii	Blue Quail			x			iam	
TURNICIDAE: Buttonquails								
Turnix hottentotta	Black-rumped Buttonquail			x	x			
Turnix sylvatica	Kurrichane Buttonquail	x	x	x	x	x		
NUMIDIDAE: Guineafowls								
Numida meleagris	Helmeted Guineafowl	x	x	x	x			
Guttera pucherani	Crested Guineafowl		x	x	x			
GRUIDAE: Cranes								
Bugeranus carunculatus	Wattled Crane	x	x	x	x			VU

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
Anthropoides paradiseus	Blue Crane	x	x				v	VU
Balearica regulorum	Crowned Crane	x	x	x	x	x		
RALLIDAE: Rails, Crakes, Gallinules, Moorhens, Coots								
Rallus caerulescens	African Rail	x	x	x	x			
Crex egregia	African Crake	x	x	x	x	x	iam	
Amaurornis flavirostris	Black Crake	x	x	x	x	x		
Crex crex	Corncrake			x	x		pm	VU
Porzana porzana	Spotted Crake	x	x			x	pm	
Porzana pusilla	Baillon's Crake	x	x			x		
Aenigmatolimnas marginalis	Striped Crake			x	x		iam	
Sarothrura elegans	Buff-spotted Flufftail			x				
Sarothrura rufa	Red-chested Flufftail	x	x	x	x	x		
Sarothrura boehmi	Streaky-breasted Flufftail			x			iam	
Porphyrula alleni	Lesser Gallinule	x	x	x	x	x	iam	
Porphyrio porphyrio	Purple Gallinule	x	x	x	x	x		
Gallinula chloropus	Moorhen	x	x	x	x	x		
Gallinula angulata	Lesser Moorhen	x	x	x	x		iam	
Fulica cristata	Red-knobbed Coot	x	x	x	x			
HELIORNITHIDAE: Finfoot								
Podica senegalensis	African Finfoot	x	x	x	x			
OTIDIDAE: Bustards and Korhaans								
Ardeotis kori	Kori Bustard	x	x	x	x	x		
Neotis denhami	Stanley's Bustard	x		x	x	x		NT
Eupodotis afraoides	White-winged Black Korhaan	x						
Eupodotis ruficrista	Red-crested Korhaan	x	x	x	x	x		
Eupodotis cafra	White-bellied Korhaan			x				
Eupodotis melanogaster	Black-bellied Korhaan	x	x	x	x	x		
JACANIDAE: Jacanas								
Actophilornis africanus	African Jacana	x	x	x	x	x		
Microparra capensis	Lesser Jacana	x	x	x	x	x		
ROSTRATULIDAE: Painted Snipe								
Rostratula benghalensis	Painted Snipe	x	x	x	x	x		
CHARADRIIDAE: Plovers								
Charadrius hiaticula	Ringed Plover	x	x	x	x		pm	
Charadrius dubius	Little Ringed Plover				x		pm/v	
Charadrius marginatus	White-fronted Plover	x	x	x	x			
Charadrius pallidus	Chestnut-banded Plover	x		x	x			
Charadrius pecuarius	Kittlitz's Plover	x	x	x	x	x		
Charadrius tricollaris	Three-banded Plover	x	x	x	x	x		

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
Charadrius asiaticus	Caspian Plover	x	x	x	x		pm	
Pluvialis squatarola	Grey Plover	x	x	x	x		pm/v	
Vanellus spinosus	Spur-winged Plover	x					v	
Vanellus coronatus	Crowned Plover	x	x	x	x	x		
Vanellus armatus	Blacksmith Plover	x	x	x	x	x		
Vanellus albiceps	White-crowned Plover	x	x	x	x			
Vanellus senegallus	Wattled Plover	x	x	x	x	x		
Vanellus crassirostris	Long-toed Plover	x	x	x	x			
SCOLOPACIDAE: Turnstones, Sandpipers, Stints, Snipe and Curlews								
Xenus cinereus	Terek Sandpiper	x	x	x	x		pm/v	
Arenaria interpres	Turnstone	x	x	x	x		pm/v	
Actitis hypoleucos	Common Sandpiper	x	x	x	x		pm	
Tringa ochropus	Green Sandpiper	x	x	x	x		pm	
Tringa glareola	Wood Sandpiper	x	x	x	x		pm	
Tringa stagnatilis	Marsh Sandpiper	x	x	x	x		pm	
Tringa nebularia	Greenshank	x	x	x	x		pm	
Tringa erythropus	Spotted Redshank	x		x			pm/v	
Tringa totanus	Redshank	x					pm/v	
Calidris melanotos	Pectoral Sandpiper	x			x		pm/v	
Calidris ferruginea	Curlew Sandpiper	x	x	x	x		pm	
Calidris temminckii	Temminck's Stint	x					pm/v	
Calidris minuta	Little Stint	x	x	x	x		pm	
Calidris alba	Sanderling	x		x	x		pm	
Philomachus pugnax	Ruff	x	x	x	x		pm	
Gallinago media	Great Snipe	x		x	x		pm	NT
Gallinago nigripennis	Ethiopian Snipe	x	x	x	x			
Limosa limosa	Black-tailed Godwit	x	x	x	x		pm/v	
Limosa lapponica	Bar-tailed Godwit	x	x	x			pm/v	
Numenius phaeopus	Whimbrel			x			pm/v	
Numenius arquata	Curlew	x		x	x		pm	
RECURVIROSTRIDAE: Avocets and Stilts								
Recurvirostra avosetta	Avocet	x	x	x	x			
Himantopus himantopus	Black-winged Stilt	x	x	x	x			
BURHINIDAE: Dikkops								
Burhinus capensis	Spotted Dikkop		x	x	x			
Burhinus vermiculatus	Water Dikkop	x	x	x	x	x		

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
GLAREOLIDAE: Coursers and Pratincoles								
Smutsornis africanus	Double-banded Courser	x	x		x			
Cursorius rufus	Burchell's Courser	x						
Cursorius temminckii	Temminck's Courser	x	x	x	x			
Rhinoptilus cinctus	Three-banded Courser	x		x	x			
Rhinoptilus chalcopterus	Bronze-winged Courser	x	x	x	x			
Glareola nuchalis	Rock Pratincole		x	x	x		iam	
Glareola pratincola	Red-winged Pratincole	x	x	x	x		iam	
Glareola nordmanni	Black-winged Pratincole	x	x	x	x		pm	DD
LARIDAE: Gulls and Terns								
Larus cirrocephalus	Grey-headed Gull	x	x	x	x			
Larus fuscus	Lesser Black-backed Gull	x	x	x	x		pm/v	
Larus ridibundus	Black-headed Gull	x					pm/v	
Gelochelidon nilotica	Gull-billed Tern	x		x	x		pm/v	
Hydroprogne caspia	Caspian Tern	x	x	x				
Chlidonias leucopterus	White-winged Tern	x	x	x	x		pm	
Chlidonias hybrida	Whiskered Tern	x	x	x	x			
RYNCHOPIDAE: Skimmers								
Rynchops flavirostris	African Skimmer	x	x	x	x		iam	NT
PTEROCLIDIDAE: Sandgrouse								
Pterocles burchelli	Burchell's Sandgrouse	x	x	x	x			
Pterocles namaqua	Namaqua Sandgrouse	x	x		x			
Pterocles gutturalis	Yellow-throated Sandgrouse	x	x	x	x	x		
Pterocles bicinctus	Double-banded Sandgrouse	x	x	x	x	x		
COLUMBIDAE: Pigeons and Doves								
Columba livia	Feral Pigeon	x	x		x			
Columba guinea	Rock Pigeon	x	x		x			
Streptopelia semitorquata	Red-eyed Dove	x	x	x	x	x		
Streptopelia decipiens	African Mourning Dove	x	x	x	x	x		
Streptopelia capicola	Cape Turtle Dove	x	x	x	x	x		
Streptopelia senegalensis	Laughing Dove	x	x	x	x	x		
Oena capensis	Namaqua Dove	x	x	x	x			
Turtur chalcospilos	Green-spotted Dove	x	x	x	x	x		
Treron calva	Green Pigeon	x	x	x	x	x		
PSITTACIDAE: Parrots, Parakeet and Lovebirds								
Polcephalus robustus suahelicus	Brown-necked Parrot	x	x	x	x	x		
Agapornis nigrigenis	Black-cheeked Lovebird			x				VU
Poicephalus meyeri	Meyer's Parrot	x	x	x	x	x		

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
MUSOPHAGIDAE: Louries								
Tauraco porphyreolophus	Purple-crested Lourie			x			v	
Tauraco schalowi	Schalow's Turaco	x	x	x	x	x		
Musophaga rossae	Ross's Lourie	x	x	x	x		v	
Corythaixoides concolor	Grey Lourie	x	x	x	x	x		
CUCULIDAE: Cuckoos and Coucals								
Cuculus canorus	European Cuckoo	x	x	x	x		pm	
Cuculus gularis	African Cuckoo	x	x	x	x		iam	
Cuculus solitarius	Red-chested Cuckoo	x	x	x	x	x	iam	
Cuculus clamosus	Black Cuckoo	x	x	x	x	x	iam	
Clamator glandarius	Great Spotted Cuckoo	x	x	x	x		iam	
Clamator levaillantii	Striped Crested Cuckoo	x	x	x	x		iam	
Clamator jacobinus	Jacobin (Pied) Cuckoo	x	x	x	x		iam/pm	
Pachycoccyx audeberti	Thick-billed Cuckoo			x	x			
Chrysococcyx cupreus	Emerald Cuckoo		x	x	x	x	iam	
Chrysococcyx klaas	Klaas's Cuckoo	x	x	x	x		iam	
Chrysococcyx caprius	Diederik Cuckoo	x	x	x	x	x	iam	
Centropus bengalensis	Black Coucal	x	x	x	x		iam	
Centropus cupreicaudus	Coppery-tailed Coucal	x	x	x	x	x		
Centropus senegalensis	Senegal Coucal	x	x	x	x	x		
Centropus superciliosus	White-browed Coucal	x	x	x	x			
TYTONIDAE: Barn and Grass Owls								
Tyto alba	Barn Owl	x	x	x	x			
Tyto capensis	Grass Owl			x				
STRIGIDAE: Typical Owls								
Strix woodfordii	Wood Owl	x	x	x	x	x		
Asio capensis	Marsh Owl	x	x	x	x			
Otus senegalensis	African Scops Owl	x	x	x	x			
Otus leucotis	White-faced Owl	x	x	x	x			
Glaucidium perlatum	Pearl-spotted Owl	x	x	x	x	x		
Glaucidium capense	Barred Owl	x	x	x	x	x		
Bubo africanus	Spotted Eagle Owl	x	x	x	x	x		
Bubo lacteus	Giant Eagle Owl	x	x	x	x			
Scotopelia peli	Pel's Fishing Owl	x	x	x	x			
CAPRIMULGIDAE: Nightjars								
Caprimulgus europaeus	European Nightjar	x	x	x	x		pm	
Caprimulgus pectoralis	Fiery-necked Nightjar	x	x	x	x	x		
Caprimulgus rufigena	Rufous-cheeked Nightjar	x	x	x	x		iam	
Caprimulgus tristigma	Freckled Nightjar	x	x	x	x			
Caprimulgus fossii	Mozambique Nightjar	x	x	x	x			

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
Macrodipteryx vexillaria	Pennant-winged Nightjar	x	x	x	x		iam	
Caprimulgus natalensis	Natal Nightjar	x	x	x	x	x		
APODIDAE: Swifts								
Apus apus	European Swift	x	x	x	x		pm	
Apus barbatus	Black Swift	x		x	x			
Apus caffer	White-rumped Swift	x	x	x	x		iam	
Apus horus	Horus Swift	x	x	x	x		iam	
Apus affinis	Little Swift	x	x	x	x			
Apus melba	Alpine Swift	x		x	x		iam	
Cypsiurus parvus	Palm Swift	x	x	x	x			
Neafrapus boehmi	Boehm's Spinetail	x	x	x	x			
COLIIDAE: Mousebirds								
Urocolius indicus	Red-faced Mousebird	x	x	x	x	x		
TROGONIDAE: Trogons								
Apaloderma narina	Narina Trogon	x	x	x	x			
HALCYONIDAE: Kingfishers								
Ceryle rudis	Pied Kingfisher	x	x	x	x	x		
Ceryle maxima	Giant Kingfisher	x	x	x	x			
Alcedo semitorquata	Half-collared Kingfisher	x	x	x	x			
Alcedo cristata	Malachite Kingfisher	x	x	x	x	x		
Ispidina picta	African Pygmy Kingfisher	x	x	x	x		iam	
Halcyon senegalensis	Woodland Kingfisher	x	x	x	x	x	iam	
Halcyon albiventris	Brown-hooded Kingfisher	x	x	x	x			
Halcyon leucocephala	Grey-hooded Kingfisher	x	x	x	x	x	iam	
Halcyon chelicuti	Striped Kingfisher	x	x	x	x	x		
MEROPIDAE: Bee-eaters								
Merops apiaster	European Bee-eater	x	x	x	x		pm	
Merops superciliosus	Olive Bee-eater			x	x		iam	
Merops persicus	Blue-cheeked Bee-eater	x	x	x	x		pm	
Merops nubicoides	Carmine Bee-eater	x	x	x	x	x	iam	
Merops boehmi	Boehm's Bee-eater			x				
Merops hirundineus	Swallow-tailed Bee-eater	x	x	x	x			
Merops bullockoides	White-fronted Bee-eater	x	x	x	x	x		
Merops variegatus	White-cheeked Bee-eater			x				
Merops pusillus	Little Bee-eater	x	x	x	x	x		
CORACIIDAE: Rollers								
Coracias garrulus	European Roller	x	x	x	x		pm	
Coracias caudata	Lilac-breasted Roller	x	x	x	x	x		
Coracias spatulata	Racket-tailed Roller	x	x	x	x	x		
Coracias naevia	Purple Roller	x	x	x	x	x		
Eurystomus glaucurus	Broad-billed Roller	x	x	x	x	x	iam	

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
UPUPIDAE: Hoopoe								
Upupa epops	Hoopoe	x	x	x	x	x		
PHOENICULIDAE: Woodhoopoes								
Phoeniculus purpureus	Red-billed Woodhoopoe	x	x	x	x	x		
Rhinopomastus cyanomelas	Scimitar-billed Woodhoopoe	x	x	x	x	x		
BUCEROTIDAE: Hornbills								
Bycanistes bucinator	Trumpeter Hornbill	x	x	x	x			
Tockus nasutus	Grey Hornbill	x	x	x	x	x		
Tockus erythrorhynchus	Red-billed Hornbill	x	x	x	x	x		
Tockus leucomelas	Southern Yellow-billed Hornbill	x	x	x	x			
Tockus alboterminatus	Crowned Hornbill		x	x	x			
Tockus pallidirostris	Pale-billed Hornbill			x				
Tockus bradfieldi	Bradfield's Hornbill	x	x	x	x	x		
Bucorvus leadbeateri	Ground Hornbill	x	x	x	x	x		
CAPITONIDAE: Barbets and Tinker Barbets								
Lybius torquatus	Black-collared Barbet	x	x	x	x	x		
Stactolaema anchietae	Anchieta's Barbet			x				
Tricholaema leucomelas	Pied Barbet	x	x		x			
Tricholaema frontata	Miombo Pied Barbet			x				
Pogoniulus chrysoconus	Yellow-fronted Tinker Barbet	x	x	x	x	x		
Lybius chaplini	Chaplin's Barbet			x				NT
Lybius minor	Black-backed Barbet			x				
Trachyphonus vaillantii	Crested Barbet	x	x	x	x	x		
INDICATORIDAE: Honeyguides								
Indicator indicator	Greater Honeyguide	x	x	x	x	x		
Indicator variegatus	Scaly-throated Honeyguide			x				
Indicator minor	Lesser Honeyguide	x	x	x	x	x		
Prodotiscus regulus	Sharp-billed Honeyguide	x	x	x	x			
Prodotiscus zambeziae	Slender-billed Honeyguide	x	x	x	x			
PICIDAE: Woodpeckers								
Campethera bennettii	Bennett's Woodpecker	x	x	x	x	x		
Campethera abingoni	Golden-tailed Woodpecker	x	x	x	x	x		
Campethera cailliautii	Little Spotted Woodpecker			x				
Dendropicos fuscescens	Cardinal Woodpecker	x	x	x	x	x		
Thripias namaquus	Bearded Woodpecker	x	x	x	x	x		
Mesopicos griseocephalus	Olive Woodpecker		x	x	x			
EURYLAIMIDAE: Broadbills								
Smithornis capensis	African Broadbill	x	x	x	x			

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
ALAUDIDAE: Larks								
Mirafra passerina	Monotonous Lark	x	x	x	x			
Mirafra africana	Rufous-naped Lark	x	x	x	x			
Mirafra apiata	Clapper Lark	x	x	x		x		
Mirafra rufocinnamomea	Flappet Lark	x	x	x	x	x		
Mirafra africanoides	Fawn-coloured Lark	x	x	x	x			
Mirafra sabota	Sabota Lark	x	x		x			
Pinarocorys nigricans	Dusky Lark	x	x	x	x		iam	
Chersomanes albofasciata	Spike-heeled Lark	x						
Spizocorys conirostris	Pink-billed Lark	x		x				
Calandrella cinerea	Red-capped Lark	x	x	x	x	x		
Eremopterix leucotis	Chestnut-backed Finchlark	x	x	x	x			
Eremopterix verticalis	Grey-backed Finchlark	x	x	x	x			
HIRUNDINIDAE: Swallows and Martins								
Hirundo rustica	European Swallow	x	x	x	x		pm	
Hirundo albigularis	White-throated Swallow	x	x	x	x		iam	
Hirundo smithii	Wire-tailed Swallow	x	x	x	x			
Hirundo dimidiata	Pearl-breasted Swallow	x	x	x	x			
Hirundo senegalensis	Mosque Swallow	x	x	x	x			
Hirundo semirufa	Red-breasted Swallow	x	x	x	x		iam	
Hirundo spilodera	South African Cliff Swallow	x					iam	
Hirundo cucullata	Greater Striped Swallow	x	x	x	x		iam	
Hirundo abyssinica	Lesser Striped Swallow	x	x	x	x		iam	
Hirundo daurica	Red-rumped Swallow				x		v	
Hirundo fuligula	Rock Martin	x		x	x			
Delichon urbica	House Martin	x	x	x	x		pm	
Pseudhirundo griseopyga	Grey-rumped Swallow	x	x	x	x			
Riparia paludicola	Brown-throated Martin	x	x	x	x			
Riparia riparia	Sand Martin	x	x	x	x		pm	
Riparia cincta	Banded Martin	x	x	x	x	x	iam	
Psalidoprocne holomelas	Black Saw-wing Swallow	x		x			iam	
Psalidoprocne albiceps	White-headed Saw-wing Swallow				x		v	
Psalidoprocne orientalis	Eastern Saw-wing Swallow		x				v	
CAMPEPHAGIDAE: Cuckooshrikes								
Coracina pectoralis	White-breasted Cuckooshrike	x	x	x	x			
Campephaga flava	Black Cuckooshrike	x	x	x	x	x		
DICRURIDAE: Drongos								
Dicrurus adsimilis	Fork-tailed Drongo	x	x	x	x	x		

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
ORIOLIDAE: Orioles								
Oriolus oriolus	European Golden Oriole	x	x	x	x		pm	
Oriolus auratus	African Golden Oriole	x	x	x	x	x	iam	
Oriolus larvatus	Black-headed Oriole	x	x	x	x	x		
CORVIDAE: Crows and Ravens								
Corvus capensis	Black Crow	x	x		x			
Corvus albus	Pied Crow	x	x	x	x			
Corvus albicollis	White-necked Raven			x	x		v	
PARIDAE: Tits								
Parus griseiventris	Northern Grey Tit			x	x			
Parus cinerascens	Ashy Tit	x	x		x			
Parus leucomelas	White-winged Black Tit			x				
Parus rufiventris	Rufous-bellied Tit		x	x				
Parus niger	Southern Black Tit	x	x	x	x	x		
SALPORNITHIDAE: Spotted Creeper								
Salpornis spilonotus	Spotted Creeper			x	x			
REMIZIDAE: Penduline Tits								
Anthoscopus minutus	Cape Penduline Tit	x	x		x			
Anthoscopus caroli	Grey Penduline Tit	x	x	x	x	x		
TIMALIIDAE: Babblers								
Turdoides jardineii	Arrow-marked Babbler	x	x	x	x	x		
Turdoides melanops	Black-faced Babbler	x	x			x		
Turdoides leucopygius	White-rumped (Hartlaub's) Babbler	x	x	x	x			
Turdoides bicolor	Pied Babbler	x	x		x			
PYCNONOTIDAE: Bulbuls								
Pycnonotus nigricans	Red-eyed Bulbul	x	x	x	x			
Pycnonotus barbatus	Black-eyed Bulbul	x	x	x	x	x		
Phyllastrephus terrestris	Terrestrial Bulbul	x	x	x	x	x		
Chlorocichla flaviventris	Yellow-bellied Bulbul	x	x	x	x	x		
Chlorocichla flavicollis	Yellow-throated Leaflove			x				
Nicator gularis	Yellow-spotted Nicator			x	x			
TURDIDAE: Thrushes, Chats, Robins and Rockjumpers								
Turdus libonyana	Kurrichane Thrush	x	x	x	x			
Turdus litsitsirupa	Groundscraper Thrush	x	x	x	x	x		
Monticola angolensis	Miombo Rock Thrush	x		x	x			
Oenanthe oenanthe	European Wheatear			x			v	
Oenanthe pileata	Capped Wheatear	x	x	x	x	x	iam	
Cercomela familiaris	Familiar Chat	x		x	x			
Thamnolaea cinnamomeiventris	Mocking Chat			x	x			

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
Thamnolaea arnoti	Arnot's Chat	x	x	x	x			
Myrmecocichla formicivora	Ant-eating Chat	x	x					
Myrmecocichla nigra	Sooty Chat			x				
Saxicola torquata	Stonechat	x	x	x	x	x		
Saxicola rubetra	Whinchat	x			x		pm/v	
Cossypha heuglini	Heuglin's Robin	x	x	x	x	x		
Cossypha natalensis	Natal Robin		x	x	x			
Cichladusa arquata	Collared Palm Thrush			x	x			
Luscinia luscinia	Thrush Nightingale	x	x	x	x		pm	
Erythropygia leucophrys	White-browed Scrub Robin	x	x	x	x	x		
Erythropygia barbata	Miombo Bearded Robin			x				
Erythropygia paena	Kalahari Robin	x	x		x			
Erythropygia quadrivirgata	Eastern Bearded Robin	x	x	x	x	x		
SYLVIIDAE: Warblers, Apalises, Crombecs, Eremomelas, Cisticolas and Prinias								
Sylvia borin	Garden Warbler	x	x	x	x		pm	
Sylvia communis	Whitethroat	x	x	x	x		pm	
Parisoma subcaeruleum	Titbabbler	x	x	x	x	x		
Hyliota australis	Mashona Hyliota			x				
Hyliota flavigaster	Yellow-breasted Hyliota			x	x	x		
Hippolais icterina	Icterine Warbler	x	x	x	x		pm	
Hippolais olivetorum	Olive Tree Warbler	x		x	x		pm	
Locustella fluviatilis	River Warbler	x		x	x		pm	
Acrocephalus arundinaceus	Great Reed Warbler	x	x	x	x		pm	
Acrocephalus scirpaceus	European Reed Warbler	x		x			pm/v	
Acrocephalus baeticatus	African Marsh Warbler	x	x	x	x	x	iam	
Acrocephalus palustris	European Marsh Warbler	x		x	x		pm	
Acrocephalus schoenobaenus	European Sedge Warbler	x	x	x	x		pm	
Acrocephalus gracilirostris	Cape Reed Warbler	x	x	x	x	x		
Acrocephalus rufescens	Greater Swamp Warbler	x	x	x	x			
Chloropeta natalensis	Yellow Warbler			x				
Bradypterus baboecala	African Sedge Warbler	x	x	x	x	x		
Schoenicola brevirostris	Broad-tailed Warbler			x				
Phylloscopus trochilus	Willow Warbler	x	x	x	x		pm	
Apalis flavida	Yellow-breasted Apalis	x	x	x	x	x		
Sylvietta whytii	Red-faced Crombec				x			
Sylvietta rufescens	Long-billed Crombec	x	x	x	x	x		
Sylvietta ruficapilla	Red-capped Crombec			x	x	x		
Eremomela icteropygialis	Yellow-bellied Eremomela	x	x	x	x			
Eremomela scotops	Green-capped Eremomela	x	x	x	x	x		
Eremomela atricollis	Black-collared Eremomela			x				

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
Eremomela usticollis	Burnt-necked Eremomela	x	x	x	x	x		
Camaroptera brevicaudata	Grey-backed Warbler	x	x	x	x	x		
Calamonastes fasciolatus	Barred Warbler	x	x		x			
Calamonastes stierlingi	Stierling's Barred Warbler	x	x	x	x			
Cisticola brunnescens/ innamomeus	Pale-crowned Cisticola			x				
Cisticola juncidis	Fan-tailed Cisticola	x	x	x	x	x		
Cisticola aridula	Desert Cisticola	x	x	x	x	x		
Cisticola rufilata	Tinkling Cisticola	x	x	x	x			
Cisticola chiniana	Rattling Cisticola	x	x	x	x	x		
Cisticola erythrops	Red-faced Cisticola	x	x	x	x			
Cisticola galactotes	Black-backed Cisticola	x	x	x	x	x		
Cisticola tinniens	Levaillant's Cisticola			x				
Cisticola natalensis	Croaking Cisticola	x		x	x			
Cisticola aberrans	Lazy Cisticola			x	x			
Cisticola woosnami	Trilling Cisticola			x				
Cisticola brachyptera	Short-winged Cisticola			x				
Cisticola pipiens	Chirping Cisticola	x	x	x	x			
Cisticola fulvicapilla	Neddicky	x	x	x	x			
Prinia subflava	Tawny-flanked Prinia	x	x	x	x	x		
Prinia flavicans	Black-chested Prinia	x	x	x	x	x		
Malcorus pectoralis	Rufous-eared Warbler	x					v	
MUSCICAPIDAE: Flycatchers and Batises								
Muscicapa striata	Spotted Flycatcher	x	x	x	x		pm	
Muscicapa caerulescens	Blue-grey Flycatcher	x	x	x	x	x		
Muscicapa boehmi	Boehm's Flycatcher			x				
Ficedula albicollis	Collared Flycatcher		x	x	x		pm	
Myioparus plumbeus	Fan-tailed Flycatcher	x	x	x	x	x		
Melaenornis pammelaina	Black Flycatcher	x	x	x	x			
Melaenornis mariquensis	Marico Flycatcher	x	x	x	x	x		
Melaenornis pallidus	Pallid Flycatcher	x	x	x	x	x		
Platysteira peltata	Wattle-eyed Flycatcher			x				
Elminia albicauda	White-tailed Blue Flycatcher			x				
Melaenornis infuscatus	Chat Flycatcher	x	x					
Sigelus silens	Fiscal Flycatcher	x					v	
Batis molitor	Chinspot Batis	x	x	x	x	x		
Batis pririt	Pririt Batis	x						
Terpsiphone viridis	Paradise Flycatcher	x	x	x	x		iam	
MOTACILLIDAE: Wagtails, Pipits and Longclaws								
Motacilla flava	Yellow Wagtail	x	x	x	x		pm	

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
Motacilla aguimp	African Pied Wagtail	x	x	x	x			
Motacilla clara	Long-tailed Wagtail			x	x			
Motacilla capensis	Cape Wagtail	x	x	x	x	x		
Motacilla cinerea	Grey Wagtail	x	x		x		pm/v	
Anthus brachyurus	Short-tailed Pipit			x				
Anthus cinnamomeus	Grassveld Pipit	x	x	x	x	x		
Anthus similis	Long-billed Pipit			x		x		
Anthus leucophrys	Plain-backed Pipit	x	x	x	x			
Anthus vaalensis	Buffy Pipit	x	x	x	x			
Anthus lineiventris	Striped Pipit			x	x			
Anthus trivialis	Tree Pipit	x		x	x		pm	
Anthus caffer	Bushveld Pipit	x						
Anthus nyassae	Wood Pipit	x	x		x			
Tmetothylacus tenellus	Golden Pipit				x		v	
Macronyx fuellebornii	Fuelleborn's Longclaw			x				
Macronyx ameliae	Pink-throated Longclaw	x	x	x	x	x		
LANIIDAE: Shrikes								
Lanius minor	Lesser Grey Shrike	x	x	x	x		pm	
Lanius collaris	Fiscal Shrike	x	x	x	x			
Lanius collurio	Red-backed Shrike	x	x	x	x		pm	
Lanius souzae	Sousa's Shrike	x	x	x				
Corvinella melanoleuca	Long-tailed Shrike	x	x	x	x			
MALACONOTIDAE: Boubous, Tchagras and Bush Shrikes								
Laniarius aethiopicus	Tropical Boubou	x	x	x	x			
Laniarius bicolor	Swamp Boubou	x	x	x	x	x		
Laniarius atrococcineus	Crimson-breasted Shrike	x	x	x	x	x		
Tchagra australis	Three-streaked Tchagra	x	x	x	x	x		
Tchagra senegala	Black-crowned Tchagra	x	x	x	x	x		
Dryoscopus cubla	Puffback	x	x	x	x	x		
Nilaus afer	Brubru	x	x	x	x	x		
Telophorus sulfureopectus	Orange-breasted Bush Shrike	x	x	x	x	x		
Malaconotus blanchoti	Grey-headed Bush Shrike	x	x	x	x			
PRIONOPIDAE: Helmet-shrikes								
Prionops plumatus	White Helmet-shrike	x	x	x	x	x		
Prionops retzii	Red-billed Helmet-shrike	x	x	x	x	x		
Eurocephalus anguitimens	White-crowned Shrike	x	x		x			
STURNIDAE: Starlings and Mynas								
Creatophora cinerea	Wattled Starling	x	x	x	x	x		

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
Cinnyricinclus leucogaster	Plum-coloured Starling	x	x	x	x	x	iam	
Lamprotornis australis	Burchell's Starling	x	x	x	x	x		
Lamprotornis mevesii	Long-tailed Starling	x	x	x	x			
Lamprotornis nitens	Glossy Starling	x	x	x	x	x		
Lamprotornis chalybaeus	Greater Blue-eared Starling	x	x	x	x	x		
Lamprotornis chloropterus	Lesser Blue-eared Starling	x	x	x	x			
Lamprotornis acuticaudus	Sharp-tailed Starling	x	x	x				
Onychognathus morio	Red-winged Starling	x		x	x			
BUPHAGIDAE: Oxpeckers								
Buphagus africanus	Yellow-billed Oxpecker	x	x	x	x	x		
Buphagus erythrorhynchus	Red-billed Oxpecker	x	x	x	x			
NECTARINIIDAE: Sunbirds								
Nectarinia mariquensis	Marico Sunbird	x	x	x	x			
Nectarinia bifasciata	Purple-banded Sunbird	x	x	x	x			
Nectarinia shelleyi	Shelley's Sunbird			x	x			
Nectarinia cuprea	Coppery Sunbird	x	x	x	x		iam	
Nectarinia manoensis	Miombo Double-collared Sunbird			x	x			
Nectarinia venusta	Yellow-bellied Sunbird			x				
Nectarinia talatala	White-bellied Sunbird	x	x	x	x			
Nectarinia senegalensis	Scarlet-chested Sunbird	x	x	x	x			
Nectarinia amethystina	Black Sunbird	x	x	x	x			
Anthreptes longuemarei	Violet-backed Sunbird			x				
Anthreptes collaris	Collared Sunbird	x	x	x	x			
ZOSTEROPIDAE: White-eyes								
Zosterops senegalensis	Yellow White-eye	x	x	x	x			
PLOCEIDAE: Sparrows, Weavers, Bishops, Widows and Queleas								
Bubalornis niger	Red-billed Buffalo Weaver	x	x	x	x			
Plocepasser mahali	White-browed Sparrow-weaver	x	x	x	x			
Passer domesticus	House Sparrow	x	x	x	x			
Passer griseus	Northern Grey-headed Sparrow			x	x			
Passer diffusus	Southern Grey-headed Sparrow	x	x	x	x			
Passer motitensis	Great Sparrow	x	x					
Passer melanurus	Cape Sparrow	x						
Petronia superciliaris	Yellow-throated Sparrow	x	x	x	x	x		
Sporopipes squamifrons	Scaly-feathered Finch	x	x		x			
Amblyospiza albifrons	Thick-billed Weaver	x	x	x	x	x		
Ploceus ocularis	Spectacled Weaver	x	x	x	x			
Ploceus cucullatus	Spotted-backed Weaver	x	x	x	x			

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
Ploceus rubiginosus	Chestnut Weaver	x	x					
Ploceus velatus	Masked Weaver	x	x	x	x	x		
Ploceus intermedius	Lesser Masked Weaver	x	x	x	x			
Ploceus angolensis	Bar-winged Weaver			x			v	
Ploceus xanthops	Golden Weaver	x	x	x	x	x		
Ploceus xanthopterus	Brown-throated Weaver	x	x	x	x			
Anaplectes rubriceps	Red-headed Weaver	x	x	x	x	x		
Anomalospiza imberbis	Cuckoo Finch	x	x	x	x			
Quelea quelea	Red-billed Quelea	x	x	x	x	x		
Quelea erythrops	Red-headed Quelea		x	x	x		iam	
Euplectes orix	Red Bishop	x	x	x	x			
Euplectes afer	Golden Bishop	x	x	x	x			
Euplectes hordeaceus	Fire-crowned Bishop			x				
Euplectes capensis	Yellow-rumped Widow			x	x			
Euplectes axillaris	Red-shouldered Widow	x	x	x	x	x		
Euplectes macrourus	Yellow-backed Widow			x	x			
Euplectes ardens	Red-collared Widow			x				
Euplectes albonotatus	White-winged Widow	x	x	x	x			
Euplectes progne	Long-tailed Widow			x			v	
ESTRILDIDAE: Twinspots, Firefinches, Waxbills and Mannikins								
Pytilia afra	Golden-backed Pytilia	x		x	x			
Pytilia melba	Melba Finch	x	x	x	x	x		
Hypargos niveoguttatus	Red-throated Twinspot			x				
Lagonosticta nitidula	Brown Firefinch	x	x	x	x	x		
Lagonosticta rhodopareia	Jameson's Firefinch	x	x	x	x	x		
Lagonosticta senegala	Red-billed Firefinch	x	x	x	x	x		
Lagonostica rubricata	Blue-billed Firefinch			x			v	
Uraeginthus angolensis	Blue Waxbill	x	x	x	x	x		
Uraeginthus granatinus	Violet-eared Waxbill	x	x	x	x	x		
Estrilda astrild	Common Waxbill	x	x	x	x	x		
Estrilda erythronotos	Black-cheeked Waxbill	x	x	x	x	x		
Estrilda perreini	Grey Waxbill			x			v	
Ortygospiza locustella	Locust Finch	x		x				
Ortygospiza atricollis	Quail Finch	x	x	x	x			
Ortygospiza gabonensis	Black-chinned Quailfinch			x				
Sporaeginthus subflavus	Orange-breasted Waxbill	x	x	x	x			
Amadina fasciata	Cut-throat Finch	x	x	x	x			
Amadina erythrocephala	Red-headed Finch	x	x					
Spermestes fringilloides	Pied Mannikin			x				
Spermestes bicolor	Red-backed Mannikin			x				
Spermestes cucullatus	Bronze Mannikin		x	x	x			

SPECIES		NBot	Capr	SW Zam	NW Zim	SE Ang	Status	RDL
VIDUIDAE: Whydahs and Widowfinches								
Vidua macroura	Pin-tailed Whydah	x	x	x	x	x		
Vidua regia	Shaft-tailed Whydah	x	x	x	x	x		
Vidua paradisea	Paradise Whydah	x	x	x	x	x		
Vidua obtusa	Broad-tailed Paradise Whydah	x	x	x	x	x		
Vidua funerea	Black Widowfinch			x			v	
Vidua purpurascens	Purple Widowfinch	x	x	x	x			
Vidua chalybeata	Steelblue Widowfinch	x	x	x	x			
FRINGILLIDAE: Canaries and Buntings								
Serinus mozambicus	Yellow-eyed Canary	x	x	x	x	x		
Serinus atrogularis	Black-throated Canary	x	x	x	x	x		
Serinus sulphuratus	Bully Canary			x				
Serinus flaviventris	Yellow Canary	x	x		x			
Serinus gularis	Streaky-headed Canary	x		x	x			
Serinus reichardi	Stripe-breasted Seed-eater			x				
Serinus mennelli	Black-eared Canary	x		x	x			
Emberiza flaviventris	Golden-breasted Bunting	x	x	x	x	x		
Emberiza cabanisi	Cabanis's Bunting			x				
Emberiza capensis	Cape Bunting	x			x		v	
Emberiza tahapisi	Rock Bunting	x	x	x	x			
Emberiza impetuani	Lark-like Bunting	x		x	x			
	TOTALS (601 species)	502	462	542	504	211		17

References

Aspinwall, D. & Beel, C. (1998). *A Field Guide to Zambian Birds not found in Southern Africa*. Zambian Ornithological Society, Lusaka.

Dowsett, R.J. & Aspinwall, D. (in prep.). *Bird Atlas of Zambia.*

Fishpool, L.D.C. & Evans, M.I. (eds.) (2001). *Important Bird Areas in Africa and Associated Islands. Priority Sites for Conservation.* Pisces Publications & BirdLife International.

Hall, B.P. & Moreau, R.E. (1970). *Atlas of Speciation in African Passerine Birds.* Trustees British Museum (Natural History), London.

Harrison, J.A., Allan, D.G., Underhill, L.G., Herremans, M., Tree, A.J., Parker, V. & Brown, C.J. (editors) (1997). *The Atlas of Southern African Birds.* BirdLife South Africa, Johannesburg.

Irwin, M.P.S. (1981). *The Birds of Zimbabwe.* Quest Publishing, Salisbury.

Maclean, G.L. (1993). *Roberts' Birds of Southern Africa.* 6th edn. Trustees John Voelcker Bird Book Fund, Cape Town.

Penry, H. (1994). *Bird Atlas of Botswana.* University of Natal Press, Pietermaritzburg.

Snow, D.W. (editor) (1978). *Atlas of Speciation in African Non-passerine Birds.* Trustees British Museum (Natural History), London.

Stattersfield, A.J. & Capper, D.R. (editors) (2000). *Threatened Birds of the World.* Lynx Edicions & BirdLife International.

Notes
The Clapper Lark in SE Angola was originally described as *Mirafra angolensis niethammeri*, but is now presumed to be a race of *M. apiata* (M. Irwin, pers.comm.).