

Birds of the Bloemfontein area, Free State Province, South Africa, during the years 1977-2000: an overview

Grzegorz KOPIJ 

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Abstract. The aim of this paper is to summarize our knowledge of the birds of the Bloemfontein area, Free State, South Africa. It presents data on the status, distribution, population densities and habitat of the birds of this area, during the years 1977-2000 (with a special emphasis on the years 1993-1998). Both published and unpublished data are analysed. Population densities were estimated mainly using the line transect method and territory mapping method. For most fairly common, common and very common species, data on population densities are provided, while for 19 species (mainly rare or very rare), distribution maps of their occupied territories are presented. A total of 324 bird species were recorded. Breeding birds comprised 60.2% of the overall species (195), while non-breeding birds made up the remaining 39.8% (129). Among the breeding species, most (55.9%) were residents throughout the year, 3.1% were intra-African migrants and 1.2% were nomads. Non-breeding birds were represented by Palearctic migrants (35 species, 10.8%) classified as vagrants, irregular and regular visitors; and African non-breeding species (94; 29.0%), which were mainly vagrants. Among the breeding species, most were rare or very rare (100 species, 56.4%). Only 24 (12.3%) of them were very common, nine of which were non-passeres and 15 passerines. The main threat to birds in the Bloemfontein area is intensive agriculture. Some suggestions and recommendations are given for more effective and efficient bird conservation in this important area.

Key words: biodiversity, censuses, Free State, population densities.

✉ Grzegorz KOPIJ, Department of Zoology & Ecology, Free State University, Bloemfontein, South Africa; Department of Vertebrate Ecology, Wrocław University of Environmental & Life Sciences, ul. Koźuchowska 5b, 51-631 Wrocław, Poland.
E-mail: gkopij@unam.na

I. INTRODUCTION

In major ornithological handbooks, data on population density for most African bird species are very limited (FRY et al. 1982-2004; DEL HOYO et al. 1992-2013). This is true even in regard to southern Africa, where ornithological studies have been much more advanced and intense than in other regions of the continent (FRY et al. 1982-2004, HOCKEY et al. 2005). However, data on the population densities of African species have only been partly retrieved from articles and notes, scattered in local and usually, not easily accessible journals. Nevertheless, there is also a real lack of data on the

population densities of less common African bird species (and those with larger territories) obtained using larger study plots or longer transects (more than 100 ha for study plots, or at least 10 km for transects), that are representative enough to make reliable estimations (BIBBY et al. 2012, SUTHERLAND 1996). To make the matter even worse, most of the data available on the population densities (breeding populations) of African birds refer to the number of individuals per 1 ha (cf. HOCKEY et al. 2005). In population studies, a breeding pair, not an individual, is the census unit (BIBBY et al. 1992, SUTHERLAND 1996). Data referring to the number of individuals (and from

such small study plots) are, therefore, of little use for comparisons between different habitats and regions, while those referring to the density of breeding pairs (e.g. TARBOTON 1980, MONADJEM 2002, KOPIJ 2017) are rare. The presented paper attempts, therefore, to partly fill this gap in our knowledge on the population densities of African birds. It provides information on the status of all bird species, as well as the population density estimates for more common species breeding in the Bloemfontein area, located in the central part of South Africa.

The first systematic account of birds in the Free State was published by VAN DER PLAAT (1961). The entire avifauna of the Bloemfontein area was more systematically recorded during the years 1977-82 by ROOS et al. (1985). In the following years (1983-86), an atlas project was conducted in this and other districts of the Free State by members of the Free State Ornithological Bird Club. The project resulted in an atlas of birds of the Free State province written by EARLE & GROBLER (1987). A similar atlas project (SABAP1) on the birds of all of southern Africa (including the Free State) was held in the following years (1987-92) (HARRISON et al. 1997).

From January 1986 to December 1987, MARX (1992) monitored all waterfowl (Anatidae) species at the Krugersdrift Dam (1886 ha) on a monthly basis. During the years 1992-1994, B. COLAHAN and D. DE SWARDT monitored birds (especially waterfowl) in two nature reserves, namely the Soetdoring NR and the Rusfontein Dam NR in the Bloemfontein area (COLAHAN 1992a, 1992b, 1993a, 1993b, 1994a, 1994b; DE SWARDT 2000).

In 1993-1998, quantitative studies were conducted on selected bird species (e.g. KOK & KOPIJ 1994) and on avian communities of selected habitats in the city of Bloemfontein (e.g. KOPIJ 1994). Most of the results from these studies were published in the local Free State ornithological journal – 'Mirafr', and were partly summarized in KOPIJ (2001) and KOPIJ (2015). At the same time avian communities were being quantified in other parts of the Bloemfontein area (e.g. KOPIJ 1997, 1998, 2000a, 2000b, 2002a). Semi-quantitative data on birds of the Botanical Gardens, a popular place for ringing birds on the outskirts of Bloemfontein, were published by DE SWARDT et al. (1992) and by KOK (1996).

Throughout the years 1993-2000, observations of rare bird species were regularly published in the local ornithological journal 'Mirafr'. This project was co-ordinated by R.J. NUTTALL.

This paper presents our knowledge on the status, distribution, numbers and habitat of birds in both the city of Bloemfontein and in the surrounding areas during the years 1977-2000. Special emphasis is paid to the years 1993-1998, when quantitative studies were conducted in various habitats for

common species, while for rarer species, censuses were conducted across the whole of the Bloemfontein area. The presented data are, therefore, mainly of historic value, but may constitute a basis for the future monitoring of any changes in the bird fauna of this region of Africa.

II. STUDY AREA

The study area includes the city of Bloemfontein, the Bloemfontein district and surrounding areas. It is situated in the central part of the Free State province of South Africa, between the Moeder River to the north and Riet River to the south (Fig. 1). The area borders the Highveld and the semi-arid Karoo, and lays at an elevation of c. 1400 m a.s.l. The surface of the study area is c. 6500 km². The human population was 747,431 (520 000 in the Greater Bloemfontein region) in 2011.

The natural vegetation in the Bloemfontein area is represented by the Dry *Cymbopogon-Themeda* Grassveld (Fig. 2). It is composed mainly of grassy plains. The dominant grasses are *Themeda triandra* and *Cymbopogon plurinoides*. Also common are the following grass species: *Eragrostis capensis*, *E. curvula*, *Setaria flabellata*, *Tristachya leucothrix*, *Heteropogon contorus*, *Hypparhenia hirta*. The watercourses form valleys which are covered mainly by *Acacia karroo* in the north (Modder River, Rhenoster River), *Salix babylonica* (Bloemspruit) in some stretches in the north-east and with sedges, reeds and grasses in the south (e.g. Kaalspruit). In the Bloemfontein area, north-west and east of the city, there are dolorite koppies covered with *Olea-Buddleia* vegetation.

The most common indigenous trees and shrubs include: *Acacia karroo*, *Buddleia salviifolia*, *Celtis africana*, *Cussonia paniculata*, *Diospyros* spp., *Euclea crispa*, *Grewia occidentalis*, *Olea europaea*, *Salix babylonica*, *Rhus erosa*, *Rhus lancea*, *R. pyroides*, *Rhamnus prinoides*, and *Ziziphus mucronata*.

The area around Bloemfontein is intensively managed farmland with numerous farmsteads, roads, exotic tree clumps and rows (*Chaemecyparis* spp., *Cupressus sempervirens*, *Cedrus atlantica*, *Dovyalis caffra*, *Eucalyptus* spp., *Jacaranda mimosifolia*, *Melia azedarach*, *Pinus* spp., *Populus* spp., *Schinus molle*, and *Thuja occidentalis*), and small dams (mostly 1-2 ha in water surface size). The main cultivated plants are maize, sunflowers and peanuts. Most of the domestic animals consist of sheep and cattle (Fig. 2).

The average annual rainfall is c. 550 mm. Three quarters of the rain falls during October-March. Summers are mild with average temperatures of 20-25°C. Winters are cold with temperatures ranging between -10°C to +12°C, with frost occurring regularly (Fig. 3).

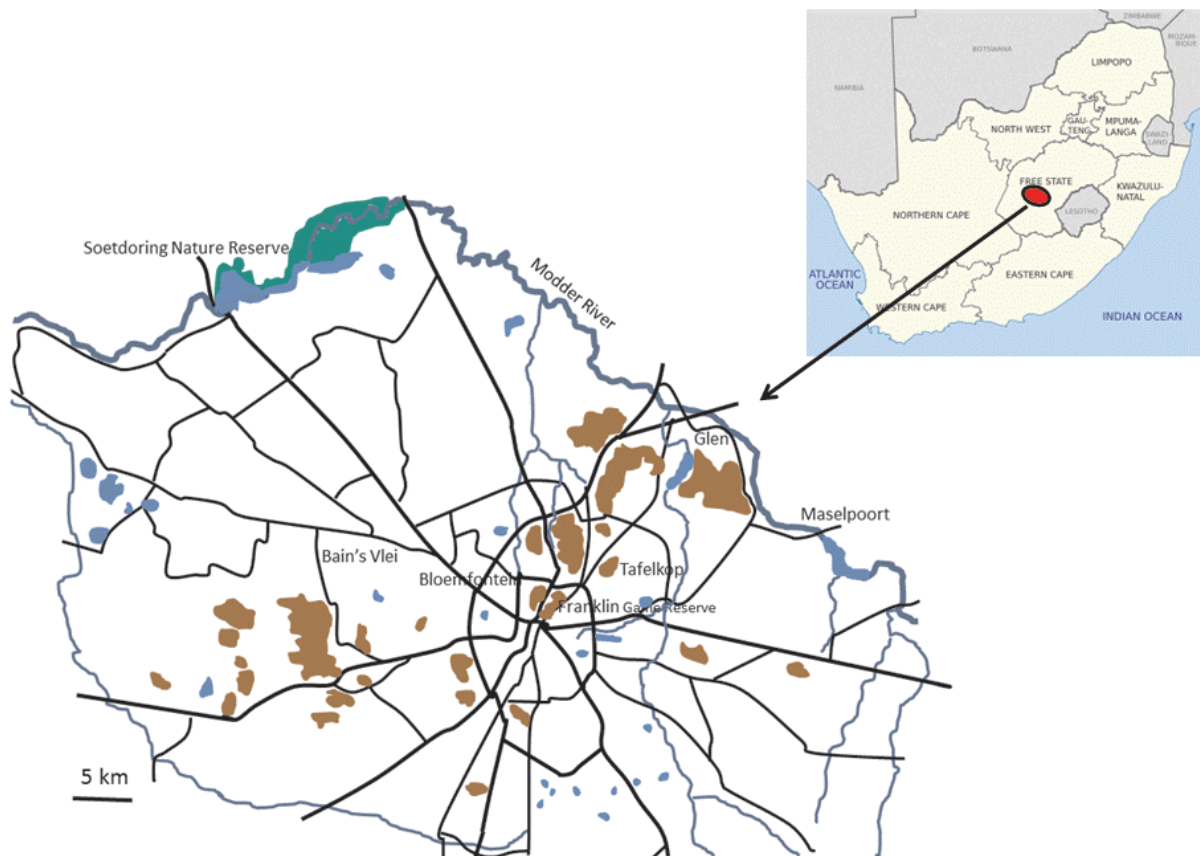


Fig. 1. The Bloemfontein study area. Brown – *Olea-Buddeia* kopies, Blue patches – dams, blue lines – rivers, black lines – roads.



Fig. 2. The suburbs of Bloemfontein (photo GK).

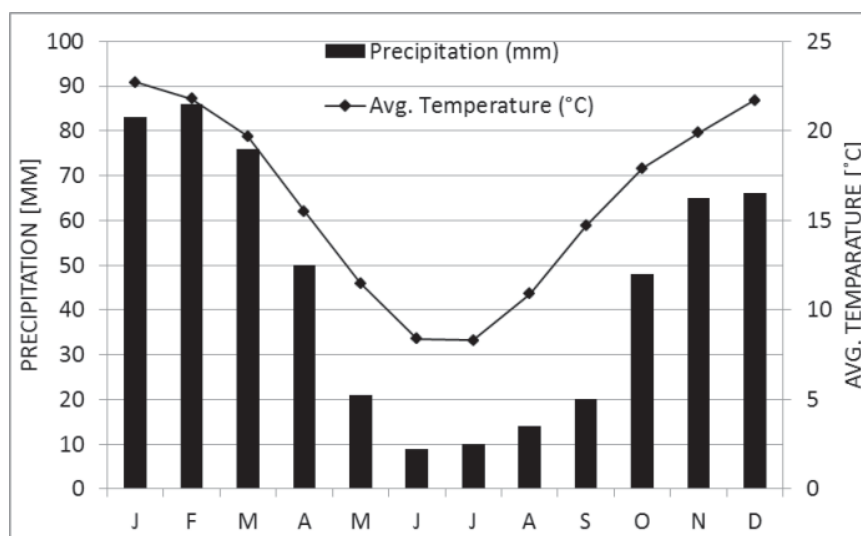


Fig. 3. Climatogram of Bloemfontein (source: <https://en.climate-data.org/africa/south-africa/free-state/bloemfontein-392>).

III. METHODS

This study is based on both published and unpublished materials, reports and observations. Most unpublished data are from the years 1993-1998, when the author was a resident in Bloemfontein.

Four study periods were distinguished: 1) 1977-1982 (ROOS et al. 1985); 2) 1983-1986 (EARLE & GROBLER 1987); 3) 1987-2002 (HARRISON et al. 1997); 4) 1993-2000 (this study). The atlas records from 1983-1992 are not dated so, only the number of records during that period is given in the text.

The following terms were used to describe the status of each bird species:

1) Vagrant: 1-10 records during 1977-2000; 2) Irregular visitor: recorded almost every year or annually, but in small numbers; 3) Regular visitor: recorded annually in large numbers; 4) Intra-African migrant: a resident in the wet season, emi-

grating in the dry season to other parts of sub-Saharan Africa; 5) Palearctic migrant: only present in the wet season, emigrating to the Palearctic region in the dry season; 6) Resident: present throughout the year (Table 1).

For breeding resident species, an attempt has been taken to assess the abundance of species. The following abundance scale has been used: 1) very rare – 1-10 pairs, 2) rare – 11-50 pairs, 3) fairly common – 51-500 pairs, 4) common – 501-5000 pairs, 5) very common >5000 pairs (Table 2).

Whenever possible, data on the population densities from various habitats are also provided for more common resident breeding species. Density is usually expressed as the number of pairs per 10 km (estimated by means of the line transect method) or as the number of pairs per 10 km² (=1000 ha) (estimated by means of the territory mapping method). The length of transects or the surface area covered are given in brackets.

Table 1

Number of bird species with different statuses recorded in the Bloemfontein area

Status	Non-passeres		Passeres		Total	
	N	%	N	%	N	%
Resident	90	50.0	91	63.2	181	55.9
Intra-African migrant	7	3.9	3	2.1	10	3.1
Breeding nomad	4	2.2	0	0.0	4	1.2
(Palearctic migrant)	(24)	(7.4)	(11)	(4.4)	(35)	(10.8)
Regular visitor	18	10.0	4	2.8	22	6.8
Irregular visitor	17	9.4	7	4.9	24	7.4
Vagrant	44	24.4	39	27.1	83	25.6
Total	180	100.0	144	100.0	324	100.0

Table 2

Number of breeding bird species with different abundance scales recorded in the Bloemfontein area during the years 1977-2000

Abundance scale	Non-passeres		Passeres		Total	
	N	%	N	%	N	%
Very rare	30	30.0	10	10.5	40	20.5
Rare	34	34.0	36	37.9	70	35.9
Fairly common	17	17.0	16	16.8	33	16.9
Common	10	10.0	18	18.9	28	14.4
Very common	9	9.0	15	15.8	24	12.3
Total	100	100.0	95	100.0	195	100.0

IV. AN ANNOTATED CHECKLIST OF SPECIES

The systematics and nomenclature of species follows HOCKEY et al. (2005).

The following abbreviations were used: ad. – adult, imm. – immature, juv. – juvenile, ex./exx. – individual/individuals, NR – Nature Reserve, UFS campus – University of the Free State campus.

Authors of photographs: GK – Grzegorz KOPIJ; SH – Susan Haig.

STRUTHIONIDAE

Ostrich *Struthio camelus*

Fairly common breeding resident in grasslands. Reintroduced from Namibia and domesticated in some farmsteads, Soetdoring NR, and Franklin NR.

PHASIANIDAE

Orange River Francolin *Francolinus levaillantoides*

Common breeding resident in grasslands and farmlands. Density: 3 pairs/230 ha, UFS campus (KOPIJ & ESTERHUIZEN 1994); 7-15 pairs/1450 ha, Biansvlei (KOPIJ 1998a); 5-7 pairs/51 km², Bloemfontein city (KOPIJ 2001); 1.4 pairs/10 km, grassland in Kaal Spruit valley (7 km transect) (KOPIJ 2000b); 3.1 pairs/10 km, *Olea-Buddleia* hills near Tafelkop and Glen (KOPIJ 2000b); 2.7 pairs/10 km, Bloem Spruit in peri-urban environment (11 km transect) (KOPIJ 1997c).

Natal Spurrowl *Pternisteis natalensis*

Fairly common breeding resident in *Salix babylonica* riparian vegetation on the Modder River, less common in the *Olea-Buddleia* vegetation. An expanding species, not recorded in the study area before 1993. Density: 2.3 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a).

Swainson's Spurrowl *Pternistes swainsonii* (Fig. 4)

Common breeding resident in cultivated fields, in close proximity to shrubs. Expanding species; recorded for the first time in 1977 (ROOS et al. 1985). Density: 3 pairs/230 ha, UFS campus (KOPIJ & ESTERHUIZEN 1994a); 10-15 pairs/51 km², Bloemfontein city (KOPIJ 2001); 7.2 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a); 11.2 pairs/10 km, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a); 7.1 pairs/10 km, *Cymbopogon-Themeda* grassland in the Kaal Spruit valley (7 km transect) (KOPIJ 2000b); 10.0 pairs/10 km, Bloem Spruit in peri-urban environment (11 km transect) (KOPIJ 1997c).



Fig. 4. Swainson's Spurrowl *Pternistes swainsonii* (GK).

Common Quail *Coturnix coturnix*

Rare intra-African migrant; breeding in cultivated fields.

Harlequin Quail *Coturnix delegorguei*

Probably very rare intra-African migrant; breeding in grasslands in a close proximity to *Acacia karroo* vegetation.

NUMIDIDAE

Helmeted Guineafowl *Numida meleagris*

Very common breeding resident in farmlands and grasslands, in close proximity to shrubs and trees. Density: 76.9 pairs/10 km, *Olea-Buddleia* vegetation (12 km transect) (KOPIJ 2013); 11-15 family groups/51 km², Bloemfontein city (KOPIJ 2001); 19.5 pairs/10 km *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 23.2 pairs/10 km, subdominant *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a); 5.0 pairs/10 km, *Acacia karroo* near Tafelkop and Glen (10 km transect) (KOPIJ 2000b); 2.9 pairs/10 km, *Cymbopogon-Themeda* grassland in the Kaal Spruit valley (7 km transect) (KOPIJ 2000b).

DENDROCYGNIDAE

Fulvous Duck *Dendrocygna bicolor*

Vagrant. Four records were made in 1983-86 (EARLE & GROBLER 1987). Average monthly number of individuals at the Krugersdrift Dam in 1986-1987 was 0.5 (MARX 1992).

White-faced Duck *Dendrocygna viduata*

Regular visitor. Small farm dams (2-3 ha each, N=7), 36 exx., (KOPIJ 2000b). The largest flock recorded was 25 exx., Krugersdrift Dam, 3.7.1992 (COLAHAN 1993a). Average monthly number of individuals at the Krugersdrift Dam in 1986-1987 was 2 (MARX 1992).

White-backed Duck *Thalassornis leuconotus*

Irregular visitor. Small farm dams (2-3 ha each, N=7), 2 exx., (KOPIJ 2000b).

ANATIDAE

Maccoa Duck *Oxyura maccoa*

Irregular visitor.

Egyptian Goose *Alopochen aegyptiacus*

Fairly common breeding resident at dams and rivers. Density: 2.9 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a); 6.8 pairs/10 km, Rhenoster River (15 km transect) (KOPIJ 2000a); 4.3 pairs/10 km, Kaal Spruit (7 km transect)

(KOPIJ 2000b). Small farm dams (2-3 ha each, N=7), 63 exx., (KOPIJ 2000b). Average monthly number of individuals at the Krugersdrift Dam in 1986-1987 was 190 (MARX 1992). Larger concentrations of non-breeding birds: 2101 exx., Krugersdrift Dam, November/December 1972 (GELDENHUYS 1975); 567 exx., Tierpoort Dam, November/December 1972 (GELDENHUYS 1975); 865 exx. Krugersdrift Dam, 3.7.1992 (COLAHAN 1993a); 846 exx., Krugersdrift Dam, 14.1.1993 (COLAHAN 1993b).

South African Shelduck *Tadorna cana*

Rare breeding resident at larger dams; common in non-breeding season. Average monthly number of individuals at the Krugersdrift Dam in 1986-1987 was 110 (MARX 1992). The largest concentration observed was 2277 moulting exx., Krugersdrift Dam, November/December 1972 (GELDENHUYS 1975).

Spur-winged Goose *Plectropterus gambensis*

Rare breeding resident in cultivated fields, in a close proximity to water. Density: 0.5 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a); 7.1 pairs/10 km, Kaal Spruit (7 km transect) (KOPIJ 2000b). Small farm dams (2-3 ha each, N=7), 37 exx. (KOPIJ 2000b). Average monthly number of individuals at the Krugersdrift Dam in 1986-1987 was 47 (MARX 1992). The larger concentrations: 443 exx., Krugersdrift Dam, November/December 1972 (GELDENHUYS 1975); 346 exx., Krugersdrift Dam, 14.1.1993 (COLAHAN 1993b).

Comb Duck *Sarkidiornis melanotos*

Vagrant in summer. 6 exx., 30 km N of Bloemfontein, 1988 (GROBLER 1988); 20 ad., 12 imm., Krugersdrift Dam, April and May 1998 (DE SWARDT 1998).

Cape Teal *Anas capensis*

Rare breeding resident at dams. Average monthly number of individuals at the Krugersdrift Dam in 1986-1987 was 7 (MARX 1992).

African Black Duck *Anas sparsa*

Rare breeding resident on the Modder River and at sewage dams in Oosteinde. Density: 1.7 pairs/10 km, Modder River (63 km transect), (KOPIJ 2000a); 4.8 pairs/10 km, Rhenoster River (15 km transect), (KOPIJ 2000a); 4.5 pairs/10 km, Bloem Spruit in peri-urban environment (KOPIJ 1997c); 2-3 pairs, Oosteinde, 1985/86 summer (KOPIJ 1997c). Average monthly number of individuals at the Krugersdrift Dam in 1986-1987 was 0.6 (MARX 1992).

Yellow-billed Duck *Anas undulata*

Common breeding resident in water courses and at dams. Density: 3.5 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a); 5.2 pairs/10 km,

Rhenoster River (15 km transect) (KOPIJ 2000a); 8.6 pairs/10 km, Kaal Spruit (7 km transect) (KOPIJ 2000b). Small farm dams (2-3 ha each, N=7), 356 exx. (KOPIJ 2000b). Average monthly number of individuals at the Krugersdrift Dam in 1986-1987 was 25 (MARX 1992). Largest concentration: 543 exx., Krugersdrift Dam, 17.1.1994 (COLAHAN 1994b).

Cape Shoveller *Anas smithii*

Rare breeding resident at dams. Small farm dams (2-3 ha each, N=7), 22 exx. (KOPIJ 2000b). Average monthly number of individuals at the Krugersdrift Dam in 1986-1987 was 1.5 (MARX 1992).

Red-billed Teal *Anas erythrorhyncha*

Rare breeding resident at dams. Small farm dams (2-3 ha each, N=7), 24 exx. (KOPIJ 2000b). Average monthly number of individuals at the Krugersdrift Dam in 1986-1987 was 7 (MARX 1992).

Southern Pochard *Netta erythrophthalma*

Rare breeding resident at dams. Small farm dams (2-3 ha each, N=7), 16 exx. (KOPIJ 2000b). Average monthly number of individuals in Krugersdrift Dam in 1986-1987 was 0.7 (MARX 1992). Largest concentration: 91 exx., Rusfontein Dam, 31.1.1992 (COLAHAN 1992b).

TURNICIDAE

Common Buttonquail *Turnix sylvaticus*

Probably, a very rare breeding resident in extensive grasslands.

INDICATORIDAE

Greater Honeyguide *Indicator indicator*

Rare breeding resident in large clumps of exotic trees, especially gum trees. Density: 0.8 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a).

Lesser Honeyguide *Indicator minor*

Very rare breeding resident. During the years 1977-83 only two records were made (ROOS et al. 1985).

Brown-backed Honeyguide *Prodotiscus regulus*

Very rare breeding resident in riparian vegetation, mainly in the northern part of the district.

PICIDAE

Golden-tailed Woodpecker *Campethera abingoni*

Very rare breeding resident in *Acacia karroo* vegetation along water courses. Recorded only during the years 1977-83 (ROOS et al. 1985).

Ground Woodpecker *Geocolaptes olivaceus*

Very rare breeding resident in eroded river banks and dongas.

Cardinal Woodpecker *Dendropicus fuscescens*

Rare breeding resident in *Acacia karroo* and *Salix babylonica*. Density: 0.8 pairs/10 km, in the Modder River (63 km transect) (KOPIJ 2000a).

Bearded Woodpecker *Dendropicus namaquus*

Vagrant. Only one record during the years 1977-82 (ROOS et al. 1985), and again in 2926AA atlas grid on 29.11.1992 (NUTTALL 1992a).

LYBIIDAE

Acacia Pied Barbet *Tricholaema leucomelas*

Common breeding resident in *Acacia karroo*, *Olea-Buddleia* vegetation, and in suburbs. An expanding species that colonised the Bloemfontein area in the 1940's-1950's (MACDONALD 1986). Density: 37 pairs/51 km² of Bloemfontein city (KOPIJ 2001); 6-8 pairs/1450 ha, Bain's Vlei farmland (KOPIJ 1998); 5 pairs/6.7 km, *Olea-Buddleia* vegetation (KOPIJ 2013); 12.9 pairs/10 km, on the Modder River (63 km transect) (KOPIJ 2000a); 8.4 pairs/10 km, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a); 3.0 pairs/10 km, *Acacia karroo* near Tafelkop and Glen (10 km transect) (KOPIJ 2000b); 5.4 pairs/10 km, *Olea-Buddleia* hills near Tafelkop and Glen (KOPIJ 2000b); 6.4 pairs/10 km, Bloem Spruit in peri-urban environment (11 km transect) (KOPIJ 1997c).

Black-collared Barbet *Lybius torquatus*

Very rare breeding resident in the Bloemfontein suburbs. An expanding species: the first record was made during the years 1983-86 in the 2826CC atlas grid (EARLE & GROBLER 1987). Duetting birds (breeding resident) were also heard in the Bloemfontein suburbs in September of 1988 (GROBLER 1989). During the years 1990-2000, three other records of what was most likely breeding birds were made in the Bloemfontein suburbs (KOPIJ 2001, DE SWARDT 2017).

Crested Barbet *Trachyphonus vaillantii* (Fig. 5)

Fairly common breeding resident in *Acacia karroo* and *Olea-Buddleia* vegetation, and in the Bloemfontein suburbs. An expanding species, for the first time recorded in Bloemfontein in 1985 (HERHOLDT & EARLE 1987). Density: 43 pairs/50 km², Bloemfontein (KOPIJ 1998b); 5.8 pairs/10 km, *Olea-Buddleia* vegetation (12 km transect) (KOPIJ 2013); 4.8 pairs/10 km, on the Modder River (63 km transect) (KOPIJ 2000a); 4-6 pairs/1450 ha, Bainsvlei, 1996 (KOPIJ 1998a); 4.5 pairs/10 km, Bloem Spruit in peri-urban environment (KOPIJ 1997c).



Fig. 5. Crested Barbet *Trachyphonus vaillantii* (SH)

BUCEROTIDAE

Grey Hornbill *Tockus nasutus*

Vagrant. 11-15 exx., Eben near Glen, June 1992 (DE SWARDT et al. 1992); 17 exx., Vleiplaas on the Modder River (28°54'S, 25°21'E), 25.6.1992 (DE SWARDT et al. 1992); 4-9 exx., Soetdoring NR, 3-13.7.1992 (NUTTALL 1992b, COLAHAN 1993a); 1-3 exx., Bloemfontein, July-August (NUTTALL 1992b).

UPUPIDAE

African Hoopoe *Upupa africana*

Common breeding resident in suburbs, farmsteads, sand river cliffs.

Density: 32 pairs/51 km², Bloemfontein (KOPIJ 1999f); 3-5 pairs/1450 ha, Bainsveli (KOPIJ 1998a); 2.6 pairs/10 km, on the Modder River (63 km transect) (KOPIJ 2000a).

PHOENICULIDAE

Green Wood-Hoopoe *Phoeniculus purpureus* (Fig. 6)

Very rare breeding resident in poplar plantations in river valleys and suburbs. During the years 1977-82, one breeding site was known on the Modder River near Glen (ROOS et al. 1985). During the years 1993-2000, three breeding sites were recorded.

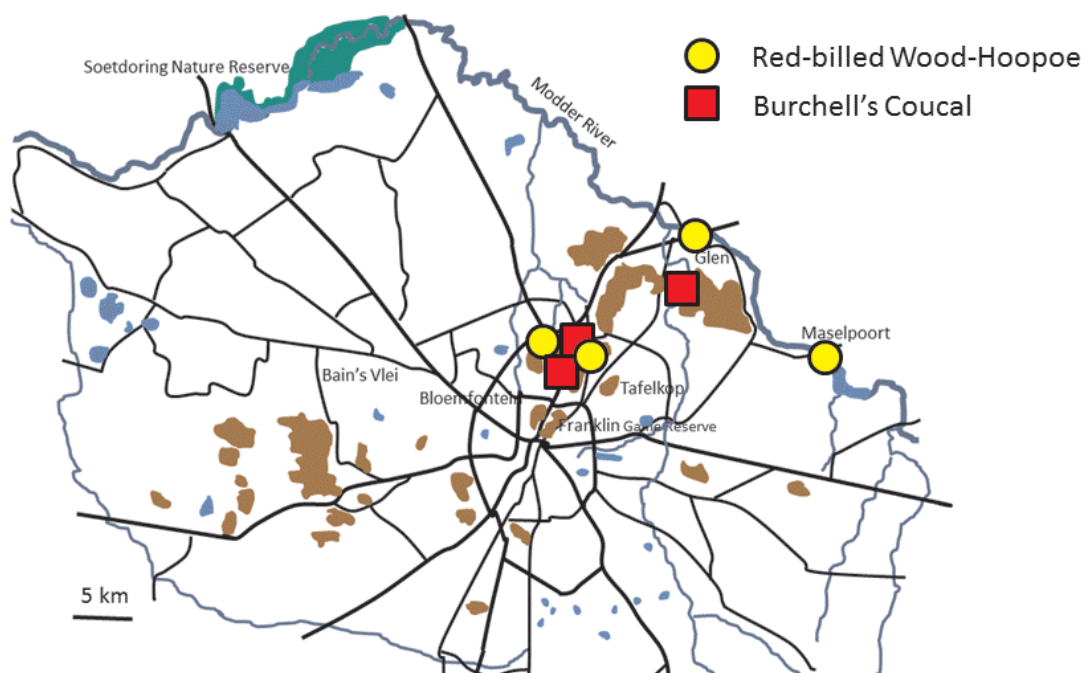


Fig. 6. Distribution of the breeding sites of the Green Wood-Hoopoe and Burchell's Coucal in the Bloemfontein area during the years 1993-2000.

RHINOPOMASTIDAE

Common Scimitarbill *Rhinopomastus cyanomelas*
Rare breeding resident in *Acacia karroo* vegetation. Density: 2.2 pairs/10 km, on the Modder River (63 km transect) (KOPIJ 2000a).

TROGONIDAE

Narina Trogon *Apaloderma narina*
Vagrant. 1 juv. (aviary escapee?), Bloemfontein, November (year not given) (EARLE & GROBLER 1987).

CORACIIDAE

European Roller *Coracias garrulus*
Vagrant. 1 imm., 1 km S of Koppies (29°25'S, 26°13'E), 3.12.1993 (NUTTALL 1994b).

Lilac-breasted Roller *Coracias caudatus*
Vagrant. 2 exx., Bain's Vlei, 3.1.1983 (NUTTALL 1992a); 3 exx., Krugersdrift Dam, 3.1.1988 (NUTTALL 1992a).

Broad-billed Roller *Eurystomus glaucurus*
Vagrant. 1 ex. (aviary escapee?), Rusfontein Dam, 20.10.1994 (NUTTALL 1994a).

ALCEDINIDAE

Malachite Kingfisher *Alcedo cristata*
Fairly common breeding resident in water courses. The most common kingfisher species. Density: 1.2 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a). A total of 76 birds were captured for ringing during the years 1993-2005 (N= 10944) at Bishop Glen (DE SWARDT et al. 2005).



Fig. 7. Pied Kingfisher *Ceryle rudis* (GK)

DACLONIDAE

Brown-hooded Kingfisher *Halcyon albiventris*
Very rare breeding resident in larger water courses.

CERYLIDAE

Giant Kingfisher *Megaceryle maximus*
Rare breeding resident in larger watercourses. Density: 0.6 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a).

Pied Kingfisher *Ceryle rudis* (Fig. 7)

Rare breeding resident in water courses. Density: 0.6 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a); 1.4 pairs/10 km, Kaal Spruit (7 km transect) (KOPIJ 2000b).

MEROPIDAE

White-fronted Bee-eater *Merops bullockoides*
Fairly common breeding resident in eroded sand cliffs on the Modder River. Density: 9.1 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 6.4 pairs/10 km, Bloem Spruit in peri-urban environment (KOPIJ 1997c). An expanding species; during the years 1981-86, only one breeding colony was known on the Modder River near Glen (HERHOLDT & EARLE 1987).

Swallow-tailed Bee-eater *Merops hirundineus*
Vagrant. Only one record was made in the 2926AA atlas grid during the years 1983-87 (EARLE & GROBLER 1987).

European Bee-eater *Merops apiaster* (Fig. 8)
Fairly common intra-African migrant; nesting in eroded, exposed river sand cliffs, sometimes large dongas; mostly on the Modder River. Density:



Fig. 8. European Bee-eater *Merops apiaster* (GK)

2.2 pairs/10 km, on Modder River (63 km transect) (KOPIJ 2000a); 4.3 pairs/10 km, Kaal Spruit (7 km transect) (KOPIJ 2000b); 14.5 pairs/10 km, Bloem Spruit in peri-urban environment (11 km transect) (KOPIJ 1997c). Extreme dates: 8.9.1979, Bloemfontein; 16.2.1982, Bloemfontein (ROOS & ROOS 1988).

COLIIDAE

White-backed Mousebird *Colius colius*

Very common breeding resident in *Acacia karroo* and *Olea-Buddleia* vegetation and in Bloemfontein suburbs. Density: 3.8 pairs/10 km, *Olea-Buddleia* vegetation (12 km transect) (KOPIJ 2013); 31 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2001, 2015); 8.8 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 8.0 pairs/10 km, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a); 7.0 pairs/10 km, *Acacia karroo* near Tafelkop and Glen (10 km transect) (KOPIJ 2000b). In Bloemfontein, its main diet in the winter consisted of the fruits of *Ligustrum vulgare* (KOPIJ 2000c).

Speckled Mousebird *Colius striatus*

Vagrant, possible very rare breeding resident in *Olea-Buddleia* koppies. 4-5 exx., Botanical Gardens in Bloemfontein, 25.11.1994 (KOPIJ 1995); 1 ad., Bloemfontein, 4.6.1999 (NUTTALL 1999b).

Red-faced Mousebird *Urocolius indicus*

Very common breeding resident in *Acacia karroo* and *Olea-Buddleia* vegetation, and in the Bloemfontein suburbs. Observed all over the district, especially common in the northern part. Density: 19.2 pairs/10 km, *Olea-Buddleia* vegetation (12 km transect) (KOPIJ 2013); 5.7 pairs/10 ha, Bloemfontein city centre (12.3 ha) (KOPIJ 1996); 50 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015); 2.3 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 10.0 pairs/10 km, *Acacia karroo* on the Rhenoster river (15 km transect) (KOPIJ 2000a); 7.1 pairs/10 km, *Cymbopogon-Themeda* grassland in the Kaal Spruit valley (7 km transect) (KOPIJ 2000b); 4.6 pairs/10 km, *Olea-Buddleia* hills near Tafelkop and Glen (KOPIJ 2000b). In Bloemfontein, its main diet in the winter consisted of the fruits of *Ligustrum vulgare* and *Celtis africana* (KOPIJ 2000c).

CUCULIDAE

Jacobin Cuckoo *Clamator jacobinus*

Rare breeding intra-African migrant; in *Acacia karroo* vegetation, in the northern part of the district. Density: 0.5 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect), (KOPIJ 2000a).

Great Spotted Cuckoo *Clamator glandarius*

Vagrant. No records before 1987 (ROOS et al. 1985, EARLE & GROBLER 1987). 1 ex., 2926BC atlas grid, 2 and 10.10.1988 (COLAHAN 1988); 1 ex., Bishop Glen, 21.10.1995 (NUTTALL 1995b).

Red-chested Cuckoo *Cuculus solitarius* (Fig. 9)

Rare intra-African migrant; in large clumps of exotic trees and shrubs. During the years 1977-82 only one calling male was recorded at Glen (LOOCK 1985, ROOS et al. 1985). During the years 1993-97, 5-10 males: (Soetdoring NR, 2-3 males; Bloemfontein, 1-2 males; Glen 2-3 males; Masel-poort 1-2 males)

Klaas Cuckoo *Chrysococcyx klaas*

Vagrant. During the years 1983-96, 2 records near Bloemfontein (EARLE & GROBLER 1987); 1 ad., Soetdoring NR, 16.12.1993 (NUTTALL 1994b).

Diederick Cuckoo *Chrysococcyx caprius*

Fairly common intra-African migrant; along water courses and in clumps of exotic trees. Density: 3.8 males/10 km, *Olea-Buddleia* vegetation (12 km transect) (KOPIJ 2013); 2.3 males/10 km, on Modder River (63 km transect) (KOPIJ 2000a); 5.2 males/10 km, Rhenoster River (15 km transect) (KOPIJ 2000a); 1.4 males/10 km, Kaal Spruit (7 km transect) (KOPIJ 2000b); 8.2 males/10 km, Bloem Spruit in peri-urban environment (11 km transect) (KOPIJ 1997c). Extreme dates: 11.10.1984, UFS campus (ROOS & ROOS 1988); 10.3.1979, Glen (ROOS & ROOS 1988).

CENTROPODIDAE

Burchell's Coucal *Centropus burchellii* (Fig. 6)

Very rare breeding resident in reed beds, in close vicinity to shrubs and water. During the years 1983-86, it was recorded as a resident in the northern part of the district (EARLE & GROBLER 1987). During the years 1993-2000, it was known from three breeding sites.

APODIDAE

African Palm Swift *Cypsiurus parvus*

Rare intra-African migrant, nesting in *Washingtonia* palms in the suburbs. Density: 2.0 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015). An expanding species; the first record in the Bloemfontein area was made on 17.8.1988: 5 exx., in the Botanical Gardens, (GROBLER 1988).

Alpine Swift *Tachymarptis melba*

Rare breeding resident in the Bloemfontein city centre; c. 20 pairs in 1997.

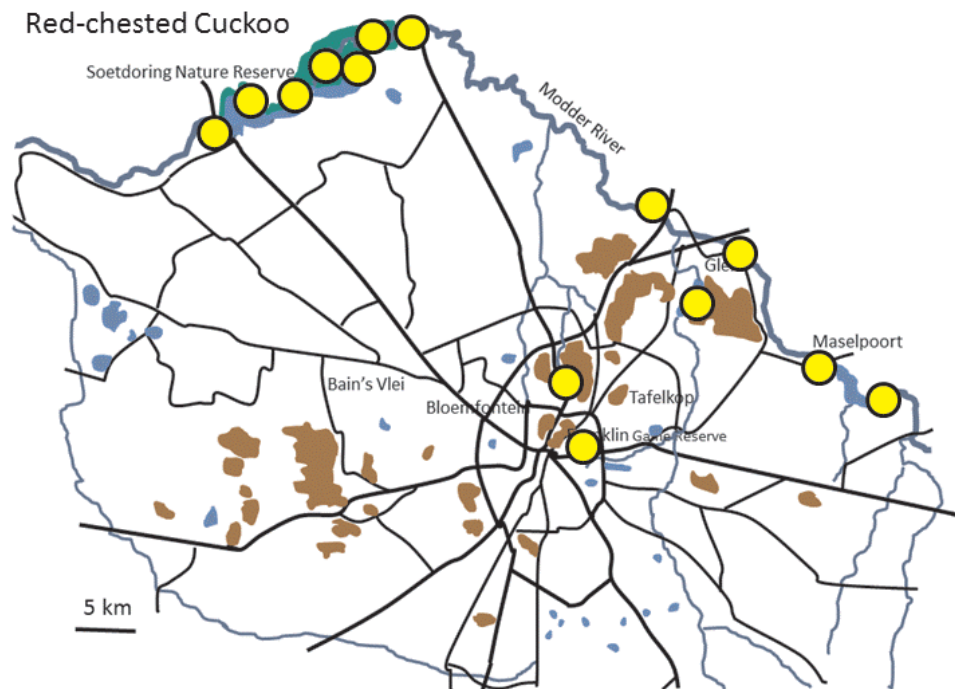


Fig. 9. Distribution of the occupied territories of the Red-chested Cuckoo in the Bloemfontein area during the years 1993-2000.

Common Swift *Apus apus*

Irregular summer visitor from the Palearctic region. Extreme dates: December-February (EARLE & GROBLER 1987).

African Black Swift *Apus barbatus*

Rare breeding resident in the suburbs of Bloemfontein.

Little Swift *Apus affinis*

Very common breeding resident; nesting in man-made structures (buildings, bridges, viaducts, towers etc.), mainly multi-storied buildings in the city centre (KOPIJ & DE SWARDT 1998a). 2980 pairs in 68 colonies/c. 50 km², Bloemfontein, 1996/97 (KOPIJ & DE SWARDT 1998a); 37.7 pairs/10 km, dominant, on the Modder River under bridges (63 km transect) (KOPIJ 2000a); 16.0 pairs/10 km, on the Rhenoster river under bridges (15 km transect) (KOPIJ 2000a).

Horus Swift *Apus horus*

Rare breeding resident in deep dongas.

White-rumped Swift *Apus caffer*

Regular visitor to urban habitats.

TYTONIDAE

Barn Owl *Tyto alba*

Fairly common breeding resident in farmlands. Density: 3-5 pairs/1450 ha, Bainsvlei, 1996 (KOPIJ 1998). In an intensively managed farmland of Bain's Vlei near Bloemfontein, the staple food consisted of ploceid birds (mainly sparrows) and murid rodents (mainly *Mastomys coucha*) (KOPIJ 1997d).

African Grass Owl *Tyto capensis*

Very rare breeding resident in karroid vegetation in close proximity to vleis. Only one record from the Bloemfontein area during the years 1983-87 (EARLE & GROBLER 1987).

STRIGIDAE

African Scops Owl *Otus senegalensis*

Vagrant.

Southern White-faced Scops-Owl *Ptilopsis granti*

Vagrant. Three records made during the years 1983-86 (EARLE & GROBLER 1987).

Spotted Eagle Owl *Bubo africanus*

Fairly common breeding resident in clumps of old gum trees in farmlands.

Verreaux's Eagle Owl *Bubo lacteus*

Vagrant. Only one record from Bloemfontein in c. 1990 (G. KOPIJ).

Marsh Owl *Asio capensis*

Rare breeding resident in extensive vleis. Density: 1.4 pairs/10 km *Cymbopogon-Themedra* grassland in the Kaal Spruit valley (7 km transect) (KOPIJ 2000b).

CAPRIMULGIDAE

Fiery-necked Nightjar *Caprimulgus pectoralis*

Vagrant.

Rufous-cheeked Nightjar *Caprimulgus rufigena*

Rare intra-African migrant. Soetdoring NR, 26.11.1994 (DE SWARDT 1994).

European Nightjar *Caprimulgus europaeus*

Regular visitor from the Palearctic region. Extreme dates: November-March (EARLE & GROBLER 1987).

COLUMBIDAE

Rock Dove *Columba livia*

Very common breeding resident, mainly in the densely built-up Bloemfontein city centre, less often in church towers in the city's suburbs. An expanding species, the first record from Bloemfontein (and district) was made in 1969 (BROOKE 1981). Density: 77 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015).

Speckled Pigeon *Columba guinea*

Very common breeding resident in urban habitats, much less common on farmsteads and rock cliffs. Density: 1014 pairs/10km², as dominant, Bloemfontein city (51 km²) (KOPIJ 2015).

Laughing Dove *Streptopelia senegalensis*

Very common breeding resident in natural vegetation, farmsteads, urban habitats, bushy habitats, and in clumps of exotic trees. Density: 42.3 pairs/10 km, as dominant, *Olea-Buddleia* vegetation (12 km transect) (KOPIJ 2013); 14.6 pairs/100 ha, Bloemfontein city centre (123 ha) (KOPIJ 1996); 27.5 pairs/10 ha, Zoological Gardens (8 ha) (KOPIJ 1999e); 3.3 pairs/10 ha, King's Park (9 ha) (KOPIJ 1999e); 340 pairs/10km², as dominant, Bloemfontein city (51 km²) (KOPIJ 2015); 46.6 pairs/10 km, as dominant, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 50.4 pairs/10 km, as dominant, *Acacia karroo* on the Rhenoster river (15 km transect) (KOPIJ 2000a); 8.0 pairs/10 km, *Acacia*

karroo near Tafelkop and Glen (10 km transect) (KOPIJ 2000b); 7.1 pairs/10 km, *Cymbopogon-Themedra* grassland in the Kaal Spruit valley (7 km transect) (KOPIJ 2000b); 10.1 pairs/10 km, *Olea-Buddleia* hills near Tafelkop and Glen (KOPIJ 2000b); 25.5 pairs/10 km, Bloem Spruit in peri-urban environment (11 km transect) (KOPIJ 1997c). The species comprised 4.5% of 1311 birds captured for ringing in the Botanical Gardens in Bloemfontein during the years 1985-2004 (DE SWARDT et al. 2004). It prefers *Rhus lancea* for nesting sites, but nests were also located in some exotic trees (KOPIJ 1998c).

Cape Turtle-Dove *Streptopelia capicola*

Very common breeding resident on farmsteads, urban habitats, in bushy habitats, and clumps of exotic trees. It prefers the Karee Tree, *Rhus lancea*, for nesting (KOPIJ 1998d). Density: 42.3 pairs/10 km, *Olea-Buddleia* vegetation, 12 km transect (KOPIJ 2013); 8.9 pairs/100 ha, Bloemfontein city centre (123 ha) (KOPIJ 1996); 18.8 pairs/10 ha, Zoological Gardens (8 ha) (KOPIJ 1999e); 8.9 pairs/10 ha, King's Park (9 ha) (KOPIJ 1999e); 321 pairs/10km², as dominant, Bloemfontein city (51 km²) (KOPIJ 2015); 31.7 pairs/10 km, as dominant, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 20.4 pairs/10 km, as subdominant, *Acacia karroo* on the Rhenoster river (15 km transect) (KOPIJ 2000a); 4.3 pairs/10 km, *Cymbopogon-Themedra* grassland in the Kaal Spruit valley (7 km transect) (KOPIJ 2000b); 18.5 pairs/10 km, *Olea-Buddleia* hills near Tafelkop and Glen (KOPIJ 2000b); 25.5 pairs/10 km, Bloem Spruit in peri-urban environment (KOPIJ 1997c). The proportion of Cape Turtle-Dove to Laughing Dove captured for ringing in the Botanical Gardens in Bloemfontein during the years 1985-2004 was 0.42 : 0.58 (N=101) (DE SWARDT et al. 2004). This species prefers *Rhus lancea* for nesting sites, but nests were also located in exotic trees, such as *Casuarina* sp. and *Thuja occidentalis* (KOPIJ 1998c).

Red-eyed Dove *Streptopelia semitorquata*

Fairly common breeding resident in well-timbered water courses, and in larger clumps of exotic trees, especially poplars and willows. Mainly in the northern part of the district and in Bloemfontein. An expanding species. Density: 0.8 pairs/100 ha, Bloemfontein city centre (123 ha) (KOPIJ 1996); 3.8 pairs/10 ha, Zoological Gardens (8 ha) (KOPIJ 1999e); 2.2 pairs/10 ha, King's Park (9 ha) (KOPIJ 1999e); 12 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015); 9.1 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 9.2 pairs/10 km, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a); 4.5 pairs/10 km, Bloem Spruit in peri-urban environment (KOPIJ 1997c).

Namaqua Dove *Oena capensis*

Fairly common breeding resident; mainly in *Acacia karroo* vegetation. During the years 1993-1998, not recorded in 51 km² in Bloemfontein city (KOPIJ 2001); 3.8 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a).

OTIDAE

Ludwig's Bustard *Neotis ludwigii*

Vagrant. 1 ad., 2.2.1987, Bloemfontein airport (O. B. KOK); 1 ex., Bishop Glen, 26.11.1996 (DE SWARDT 1994).

Kori Bustard *Ardeotis kori*

Probably, a very rare breeding resident in Soetdoring NR: 6 exx., Soetdoring NR, 6.8.1992 (COLAHAN 1993a); a flock, Soetdoring NR, 29.11.1997 (NUTTALL 1997).

Northern Black Korhaan *Eupodotis afraoides* (Fig. 10)

Common breeding resident in grasslands, especially those with abundant termite mounds. Density: 4-5 pairs, Bloemfontein city (51 km²) (KOPIJ 2001), including 3 pairs/230 ha, UFS campus grassland (KOPIJ & ESTERHUIZEN 1994a); 2.0 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 8.6 pairs/10 km, *Cymbopogon-Themeda* grassland in the Kaal Spruit valley (7 km



Fig. 10. Northern Black Korhaan *Eupodotis afra* (GK)

transect) (KOPIJ 2000b); 5.5 pairs/10 km, Bloem Spruit in peri-urban environment (KOPIJ 1997c).

Blue Korhaan *Eupodotis caerulescens*

Fairly common breeding resident in grassland in close proximity to water bodies.

GRUIDAE

Grey Crowned Crane *Balearica regulorum*

Vagrant. During the years 1983-86, only 2 records were made (EARLE & GROBLER 1987); during 1993-2000: 3 records: 1 ad., Krugersdrift Dam, 25.8.1991 (COLAHAN 1992a); 1 ad., Krugersdrift Dam, 28.1.1992 (COLAHAN 1992b); 1 ad., Rusfontein Dam, 31.1.1992 (COLAHAN 1992b).

Blue Crane *Anthropoides paradiseus*

Irregular visitor. Largest recorded concentration: 42 exx., Krugersdrift Dam, 28.5.1992 (COLAHAN 1992b).

RALLIDAE

Buff-spotted Flufftail *Sarothrura elegans*

Probably, a very rare breeding resident at dams with emergent vegetation.

African Rail *Rallus caerulescens*

Very rare breeding resident.

Black Crake *Amaurornis flavirostris*

Rare breeding resident at large dams and rivers with extensive reed vegetation. During the years 1977-86 not recorded (ROOS et al. 1985, EARLE & GROBLER 1987); a few exx., Wuras Dam, 11.6.1992 (COLAHAN 1992b); 1 ex., Bishop Glen Dam, 12.3.1994 and 26.11.1994, (NUTTALL 1994b, DE SWARDT 1994); 1 ex., Modder River in Soetdoring NR, 16.5.1998 (DE SWARDT 1998).

Baillon's Crake *Porzana pusilla*

Very rare breeding resident at dams: 1 pair, Bishop Glen Dam, 21.11.1998 (NUTTALL 1998c).

African Purple Swampphen *Porphyrio madagascariensis* (Fig. 11)

Very rare breeding resident at sewage dams and large dams with extensive reed vegetation. During the years 1977-82 recorded at Oosteinde (ROOS et al. 1985). During the years 1993-2000 2 breeding sites were recorded.

Common Moorhen *Gallinula chloropus*

Fairly common breeding resident in water courses with reeds, at larger dams with emergent vegetation and at sewage dams. Density: 1.8 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a); 8.8 pairs/10 km, Rhenoster River (15 km transect) (KOPIJ 2000a).

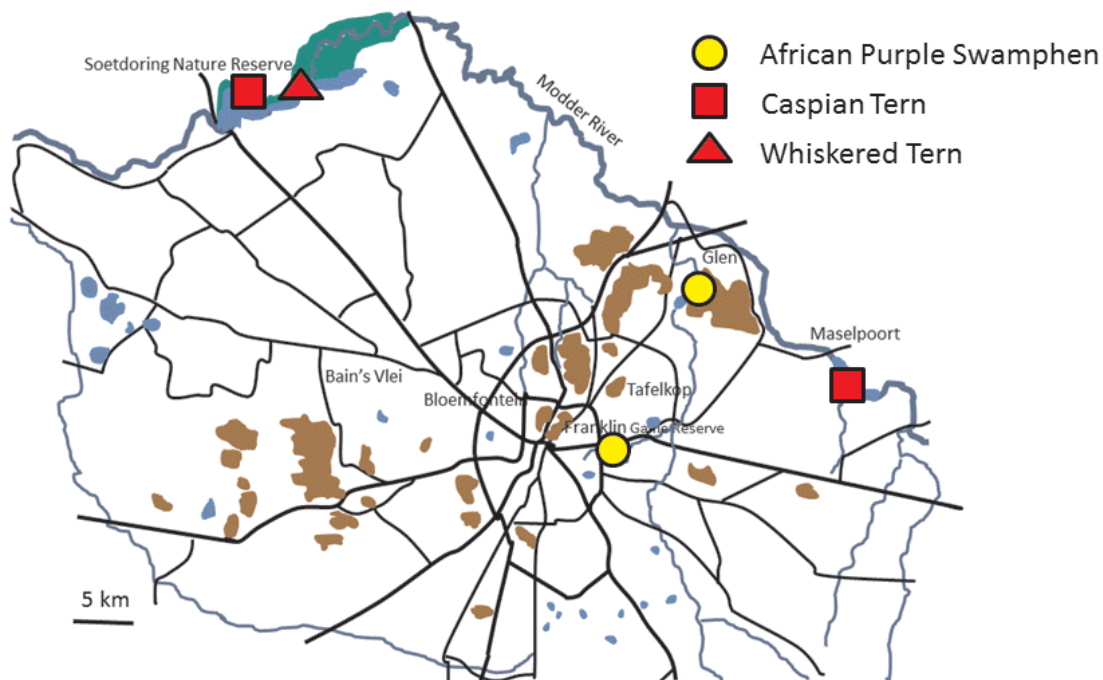


Fig. 11. Distribution of the breeding sites of the African Purple Swamphen, Caspian Tern and Whiskered Tern in the Bloemfontein area during the years 1993-2000.

Red-knobbed Coot *Fulica cristata*

Common breeding resident at dams and in rivers. Density: 6.8 pairs/10 km, Rhenoster River (15 km transect) (KOPIJ 2000a); small farm dams (2-3 ha each, N=7), 445 exx., (KOPIJ 2000b).

PTEROCLIDAE

Namaqua Sandgrouse *Pterocles namaqua*

Vagrant. During the years 1983-86, 4 records were made in the north-western part of the district (EARLE & GROBLER 1987); 7 exx., Krugersdrift Dam, 2.10.1992 (COLAHAN 1993a).

SCOLOPACIDAE

African Snipe *Gallinago nigripennis*

Rare breeding resident at dams.

Marsh Sandpiper *Tringa stagnatilis*

Irregular summer visitor from the Palearctic region. Small farm dams (2-3 ha each, N=7), 10 exx. (KOPIJ 2000b).

Common Greenshank *Tringa nebularia*

Regular summer visitor from the Palearctic region. Small farm dams (2-3 ha each, N=7), 22 exx. (KOPIJ 2000b).

Wood Sandpiper *Tringa glareola*

Regular summer visitor from the Palearctic region. Small farm dams (2-3 ha each, N=7), 536 exx., the most common Palearctic wader (KOPIJ 2000b).

Common Sandpiper *Actitis hypoleucos*

Regular summer visitor from the Palearctic region.

Ruddy Turnstone *Arenaria interpres*

Vagrant from the Palearctic region. 2 exx., Krugersdrift Dam, 12.2.1998 (NUTTALL 1998a); 3 exx., Krugersdrift Dam, 11.10.1998 (NUTTALL 1998d).

Little Stint *Calidris minuta*

Regular summer visitor from the Palearctic region. Small farm dams (2-3 ha each, N=7), 435 exx., second most common Palearctic wader (KOPIJ 2000b). Largest concentration: 542 exx., Rusfontein Dam, 18.1.1993 (NUTTALL 1993b).

Curlew Sandpiper *Calidris ferruginea*

Regular visitor from the Palearctic region. Small farm dams (2-3 ha each, N=7), 22 exx., (KOPIJ 2000b). Largest concentration: 354 exx., Rusfontein Dam, 18.1.1993 (NUTTALL 1993b).

Ruff *Philomachus pugnax*

Regular summer visitor from the Palearctic region.

ROSTRATULIDAE

Greater Painted-snipe *Rostratula bengalensis*

Irregular visitor. Only two records were made in the north-eastern part of the district during the years 1983-86 (EARLE & GROBLER 1987).

JACANIDAE

African Jacana *Actophilornis africana*

Vagrant or a probably very rare breeding resident at sewage dams with emergent vegetation, Oosteinde, 1977-82 (ROOS et al. 1985).

BURHINIDAE

Spotted Thick-knee *Burhinus capensis*

Common breeding resident in wasteland, eroded lands, overgrazed grassland. Density: 15 pairs/50 km², Bloemfontein (KOPIJ 1997a); 3-5 pairs/1450 ha, Bainsvlei, 1996 (KOPIJ 1998a); 1.2 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a).

RECURVIROSTRIDAE

Black-winged Stilt *Himantopus himantopus*

Regular visitor.

Pied Avocet *Recurvirostra avosetta*

Regular visitor.

CHARADIIDAE

Ringed Plover *Charadrius hiaticula*

Vagrant from the Palearctic region. During the years 1977-82 it was not recorded (ROOS et al. 1985); during the years 1983-86 – 3 records (EARLE & GROBLER 1987); 'a few' exx., Rusfontein Dam, 18.1.1993 (COLAHAN 1993b); 8 exx., Rusfontein Dam, 13.7.1993, (COLAHAN 1994a); Krugersdrift Dam, 26.11.1994 (DE SWARDT 1994).

Kittlitz's Plover *Charadrius pecuarius*

Fairly common breeding resident at dams. Small farm dams (2-3 ha each, N=7), 20 exx. (KOPIJ 2000b).

Three-banded Plover *Charadrius tricollaris*

Common breeding resident at dams and rivers in rocky valleys. Density: 1.4 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a); 4.3 pairs/10 km, Kaal Spruit (7 km transect) (KOPIJ 2000b); 8.2 pairs/10 km, Bloem Spruit in peri-urban environment (KOPIJ 1997c); small farm dams (2-3 ha each, N=7), 22 exx., (KOPIJ 2000b).

Chestnut-banded Plover *Charadrius pallidus*

Vagrant. Two records were made in the western part of the district during the years 1983-86 (EARLE & GROBLER 1987).

Northern Lapwing *Venellus vanellus*

Vagrant. A questionable record of a ringed bird found dead near Bloemfontein in December 1947 (VAN EE 1955). This would constitute the only record of this species in southern Africa (HOCKEY et al. 2005).

Blacksmith Lapwing *Vanellus armatus*

Common breeding resident in mown grass in the suburbs, vleis and dam banks. Density: 70 pairs (sic!) at 11 sites/50 km², Bloemfontein (KOPIJ & KOK 1994); 2.2 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a); 6.8 pairs/10 km, Rhenoster River (15 km transect) (KOPIJ 2000a); 14.3 pairs/10 km, *Cymbopogon-Themedra* grassland in the Kaal Spruit valley (7 km transect) (KOPIJ 2000b); 12.7 pairs/10 km, Bloem Spruit in peri-urban environment (11 km transect) (KOPIJ 1997c); small farm dams (2-3 ha each, N=7), 48 exx., (KOPIJ 2000b).

Crowned Lapwing *Vanellus coronatus*

Very common breeding resident in short grassland, cultivated fields, wastelands, mown grass in suburbs. Density: 199 pairs (sic!) at 21 sites/50 km², Bloemfontein, 1993 (KOPIJ & KOK 1994); 2.9 pairs/10 km, *Cymbopogon-Themedra* grassland on Kaal Spruit valley (7 km transect) (KOPIJ 2000b); Bainsvlei farmland, domination: 2.1% (KOPIJ 1998a).

GLAREOLIDAE

Double-banded Courser *Rhinoptilus africanus*

Rare breeding nomad in dry, short grass.

Burchell's Courser *Cursorius rufus*

Rare breeding nomad in dry grassland.

Temminck's Courser *Cursorius temminckii*

Rare breeding nomad in short grass.

Black-winged Pratincole *Glareola nordmanni*

Vagrant from the Palearctic Region. About 3000 exx., Soetdoring NR, 5.3.1993 (COLAHAN 1993b).

LARIDAE

Grey-headed Gull *Larus cirrocephalus*

Irregular visitor to large dams and sewage dams. Largest concentration: 62 exx., Soetdoring NR, 28.1.1992 (COLAHAN 1992b).

Caspian Tern *Sterna caspia* (Fig. 11)

Probably, a very rare breeding resident at large dams. Not recorded before 1993. During the years 1993-2000, single pairs nested at the Krugersdrift and Rusfontein Dams.

Whiskered Tern *Chlidonias hybrida* (Fig. 11)

Very rare breeding resident. 'a number of birds in full breeding plumage', Bishop Glen Dam, 21.10.1995 (NUTTALL 1995b). A pair at small pan was recorded on 25.2.1996 and feeding, Soetdoring NR, 6.3.1996 (NUTTALL 1996), where they also nested in successive years.

White-winged Tern *Chlidonias leucopterus*

Regular summer visitor from the Palearctic region.



Fig. 12. African Fish-Eagle *Haliaeetus vocifer* (SH)

ACCIPITRIDAE

Osprey *Pandion haliaetus*

Irregular visitor. 1977-82, not recorded (ROOS et al. 1985); 4 records in 1983-86 (EARLE & GROBLER 1987); 2 exx., 9.3.1985, Soetdoring NR (NAUDE 1985; 1 ex., 30.1.1991, Rusfontein Dam (COLAHAN 1992a).

Black-shouldered Kite *Elanus caeruleus*

Fairly common breeding resident in farmlands, usually in close proximity to farmsteads and dams. The most common raptor species. During the years

1993-97, the population in the whole study area was estimated at 100-200 pairs.

Black Kite *Milvus migrans*

Irregular visitor from the Palearctic region.

African Fish-Eagle *Haliaeetus vocifer* (Figs 12, 13)

Very rare breeding resident. During the years 1972-82, 4-6 nests were found (1-2 nests at Soetdoring NR, Tierpoort Dam, 1-2 nests near Glen,

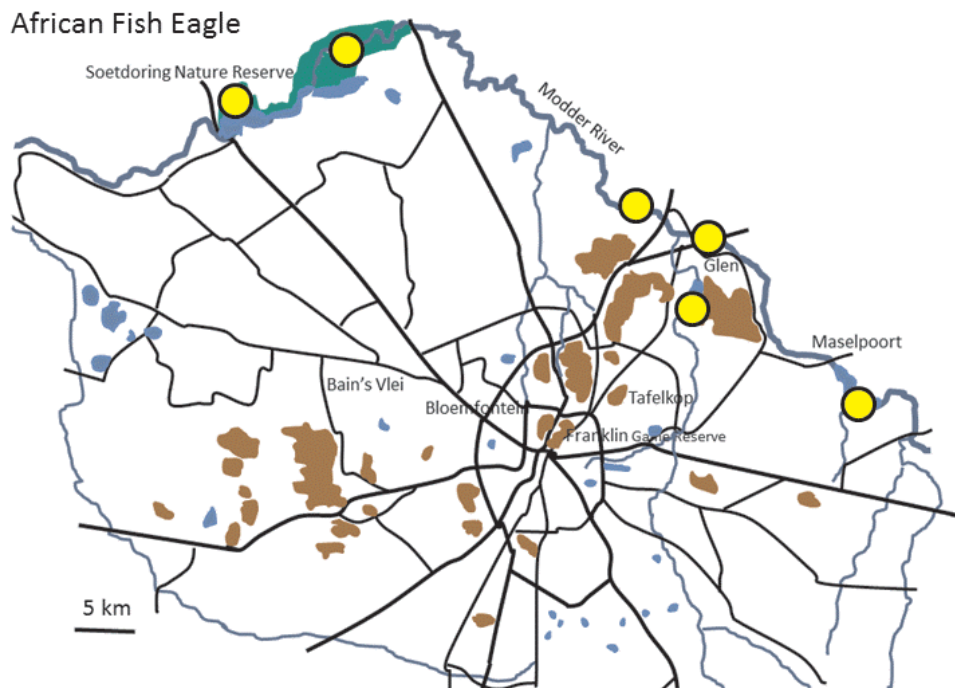


Fig. 13. Distribution of the occupied territories of the African Fish-Eagle.

and Bishop Glen; GELDENHUYS 1984, ROOS et al. 1985). During the years 1993-2000, 6 breeding pairs were recorded (Fig. 5). Largest concentrations: 10 exx., Soetdoring NR, 1972-79 and 7 exx., Rusfontein Dam (GELDENHUYS 1984).

White-backed Vulture *Gyps africanus*

Vagrant. 1 ex., Soetdoring NR, 12.1.1994 (COLAHAN 1994b).

Cape Vulture *Gyps coprotheres*

Vagrant. During the years 1977-82, one bird was recorded in the southern part of the district (ROOS et al. 1985). During the years 1983-86, two further records were made in the southern part (EARLE & GROBLER 1987).

Black-chested Snake-Eagle *Circaetus pectoralis*

Vagrant. During the years 1977-82, single birds were recorded in the northern and western parts of the district (ROOS et al. 1985). During the years 1983-86, two records were made around Soetdoring NR (EARLE & GROBLER 1987); 1 imm., 21.2.1995, 17 km E of Bloemfontein (VAN NIEKERK 1996); 1 imm., 16.1.1996, Glen, (VAN NIEKERK 1996).

African Marsh-Harrier *Circus ranivorus*

Vagrant.

Black Harrier *Circus maurus*

Vagrant in winter. During the years 1983-86, 4 records were made (EARLE & GROBLER 1987); 1 ex., 1-16.5.1998, Soetdoring NR (NUTTALL 1998b).

Pallid Harrier *Circus macrourus*

Vagrant from the Palearctic region. 1 exx., Soetdoring NR, 26.11.1994 (DE SWARDT 1994); 2 males, 3 females, 6 km SW of Soutpan, 21.12.1995 (NUTTALL 1996).

African Harrier-Hawk *Polyboroides typus*

Vagrant; one possible breeding pair near Glen.

Southern Pale Chanting Goshawk *Melierax canorus* (Fig. 14)

Very rare breeding resident in extensive grasslands with *Olea-Buddleia* or *Acacia karroo* vegetation. Two territories were located at Glen and Soetdoring NR.

Gabar Goshawk *Melierax gabar*

Very rare breeding resident in large clumps of tall exotic trees. During the years 1993-97 occupied territories were found at Moselpoort, Bainsvlei (KOPIJ 1998a), Glen, Rusthof (NUTTALL 1996).

Red-breasted Sparrowhawk *Accipiter rufiventris*

Very rare breeding resident.



Fig. 14. Southern Pale Chanting Goshawk *Melierax canorus* (GK)

Black Goshawk *Accipiter melanoleucus*

Very rare breeding resident in larger old gum tree plantations. An expanding species, recorded for the first time in the Bloemfontein district in 1994: an occupied nest with three chicks was found in Bishop Glen (KOPIJ & ESTERHUIZEN 1994b, BREEDT 1995). In 1997, occupied territory was also recorded in Bain's Vlei.

Steppe Buzzard *Buteo vulpinus*

Regular summer visitor to farmlands (prefers maize fields), from the Palearctic region. The latest date: 23.3.1994, de Burg (NUTTALL 1994a).

Jackal Buzzard *Buteo rufofuscus*

Regular visitor in grasslands in the southern part of the district.

Tawny Eagle *Aquila rapax* (Figs 15, 16)

Very rare breeding resident in extensive natural vegetation with *Acacia karroo*. Till 1980, it nested on the farm Onze Rust (19 km S of Bloemfontein) (ROOS et al. 1985); 1 ad., Soetdoring NR, 30.11.1993 (COLAHAN 1994a). During the years 1993-2000, two occupied territories were recorded.



Fig. 15. Tawny Eagle *Aquila rapax* (GK)

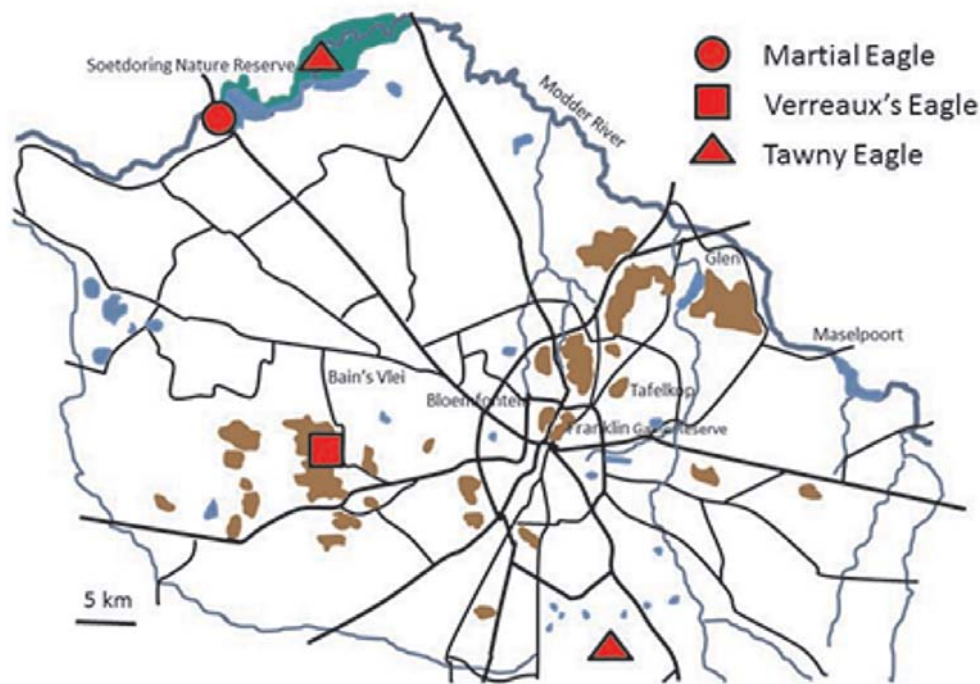


Fig. 16. Distribution of the occupied territories of the Tawny Eagle, Verreaux's Eagle and Martial Eagle in the Bloemfontein area during the years 1993-2000.

Verreaux's Eagle *Aquila verreauxii* (Fig. 16)

Very rare breeding resident. One pair, Kloofeinde (18 km W of Bloemfontein), 1977-82 (ROOS et al. 1985). It probably also nested there during the years 1993-2000.

Booted Eagle *Aquila pennatus*

Vagrant. During the years 1977-82 it was not recorded (ROOS et al. 1985); during the years 1983-86, 3 records were made in the northern part of the district (EARLE & GROBLER 1987); 1 ad., Kloofeinde, 15.10.1995 (NUTTALL 1995b); 1 ex., Glen, 22.1.1996 (NUTTALL 1996).

Martial Eagle *Polemaetus bellicosus* (Fig. 16)

Very rare breeding resident in extensive grassland with *Acacia karroo* vegetation. An occupied nest was found on the Modder River around the Soetdoring N.R.

Long-crested Eagle *Lophaetus occipitalis*

Vagrant. 1977-83, not recorded (ROOS et al. 1985).

SAGITTARIIDAE

Secretarybird *Sagittarius serpentarius* (Figs 17, 18)

Rare breeding resident in extensive grassland with *Acacia karroo* vegetation. During the years 1993-97, 6-8 breeding pairs.



Fig. 17. Secretarybird *Sagittarius serpentarius* (SH)

FALCONIDAE

Peregrine Falcon *Falco peregrinus*

Vagrant; possibly, a very rare breeding resident. During the years 1983-86 only one record was made near Bloemfontein (EARLE & GROBLER 1987). During the years 1993-97, 1-2 possible breeding pairs.

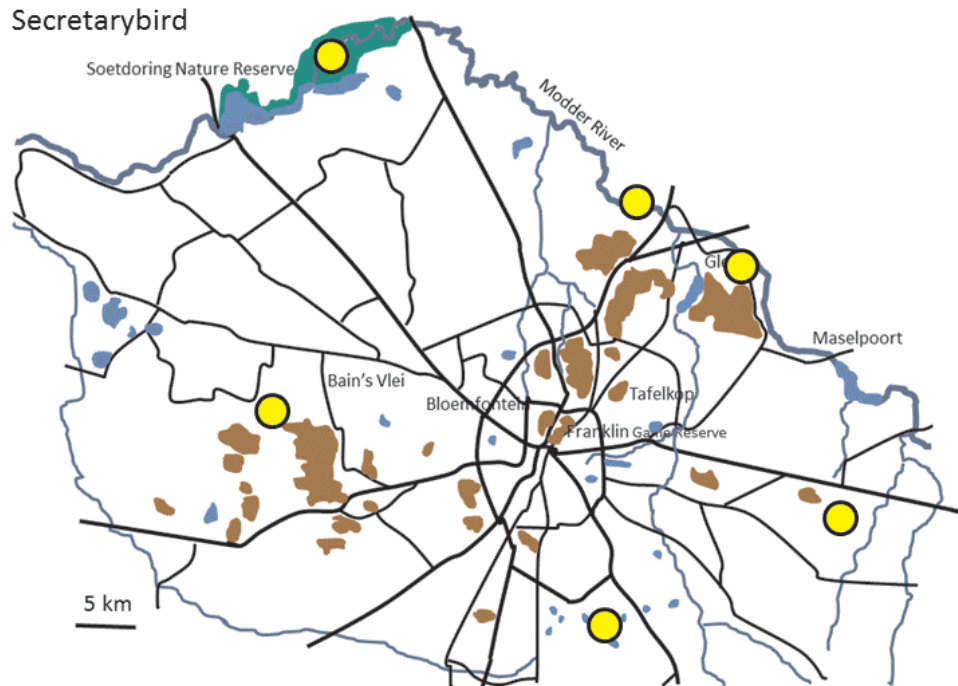


Fig. 18. Distribution of the occupied territories of the Secretarybird in the Bloemfontein area during the years 1993-2000.

Lanner Falcon *Falco biarmicus*

Rare breeding resident in koppies with high rock cliffs.

Hobby Falcon *Falco subbuteo*

Vagrant from the Palearctic region.

Western Red-footed Kestrel *Falco vespertinus*

Vagrant from the Palearctic region.

Eastern Red-footed Kestrel *Falco amurensis*

Regular summer visitor from the Palearctic region. Only one record during the years 1983-86 (EARLE & GROBLER 1987). Since February 1997, it regularly roosts in a gum tree clump in Oosteinde in Bloemfontein, with increasing numbers, year after year (DE SWARDT 2017).

Rock Kestrel *Falco rupicolus*

Rare breeding resident. Koppies with high rock cliffs, hunting in open farmland. Not recorded as nesting in Bloemfontein city (KOPIJ 2001, 2015).

Greater Kestrel *Falco rupicoloides*

Rare breeding resident in extensive grassland.

Lesser Kestrel *Falco naumanni*

Regular summer visitor from the Palearctic region; regularly, year after year roosting in a huge gum tree in Bloemfontein since at least 1960 (KOPIJ 2001); roosting sites were also observed in gum trees in Oosteinde (ROOS & ROOS 1986, 1988;

COLAHAN 1993b; NUTTALL 1997); c. 4000 exx., summer 1985/86 (ROOS & ROOS 1986); 1500-2000 exx., 7.11.1994 (NUTTALL 1994a). Extreme dates: 11.10.1985 and 23.5.1982 (ROOS & ROOS 1988). The diet of birds roosting in Bloemfontein was composed mainly of Solifugae, supplemented by Coleoptera and Orthoptera (KOPIJ 1998d, 2002a).

PODICIPEDIDAE

Dabchick *Tachybaptus ruficollis*

Fairly common breeding resident in dams and pans. Small farm dams (2-3 ha each, N=7), 91 exx. (KOPIJ 2000b).

Great Crested Grebe *Podiceps cristatus*

Irregular visitor. 3 exx., Rusfontein Dam, 1977-82 (ROOS et al. 1985); 1 ex. in August, 2825DD, during the years 1983-86; a pair in display, Rusfontein Dam, 7.8.1991; 3 exx., Rusfontein Dam, 2.9.1993 (COLAHAN 1994a); 2 ad., Soetdoring NR, 25.4.1998 (DE SWARDT 1998). Small farm dams (2-3 ha each, N=7), 2 exx., (KOPIJ 2000b).

Black-necked Grebe *Podiceps nigricollis*

Vagrant; irregular breeder at sewage dams with dense emergent vegetation. During 1987/88 summer, breeding was recorded at Oosteinde in Bloemfontein (EARLE 1988). A flock of c. 50 indi-

viduals was recorded on 1.5.1988 at a salt pan at Florisbad (EARLE 1988). During the years 1983-86, one record was made in the 2926AB atlas grid (EARLE & GROBLER 1987).

ANHINGIDAE

Darter *Anhinga melanogaster*

Very rare breeding resident in dams and rivers. In 1991/92 summer, a few breeding pairs were recorded at Olive Hills in Soetdoring NR (COLAHAN 1992a).

PHALACROCORACIDAE

White-breasted Cormorant *Phalacrocorax lucidus*
Irregular visitor to dams and the Modder River.

Reed Cormorant *Microcarbo africanus*

Rare breeding resident at dams and rivers. 10 pairs, Thorngrove on the Modder River, 9.1.1986 (ROOS et al. 1986); a few breeding pairs, 1991/92 summer, Olive Hills at Soetdoring NR (COLAHAN 1992a); 10 nests in a heronry, Oosteinde, 1995/96 summer (KOPIJ 1997b).

ARDEIDAE

Great White Heron *Egretta alba* (Fig. 19)

Probably, a very rare breeding resident. Probably three pairs, 1986/87 summer, Thorngrove on

Modder River (ROOS et al. 1986); c. 7 pairs, Soetdoring NR, 28.1.1992 (COLAHAN 1992b). The species also nested there in successive years.

Little Egret *Egretta garzetta* (Fig. 19)

Rare breeding resident at dams and rivers. 10 pairs, Thorngrove on Modder River, 9.1.1986 (ROOS et al. 1986); c. 10 pairs, Soetdoring NR, 28.1.1992 (COLAHAN 1992b); 3 nests in a heronry, Oosteinde, 1995/96 summer (KOPIJ 1997c). The species also nested there in successive years.

Yellow-billed Egret *Egretta intermedia*

Very rare breeding resident at dams and rivers. 5-10, probably breeding pairs, Thorngrove on the Modder River, 9.1.1986 (ROOS et al. 1986); a few pairs, Olive Hills in Soetdoring NR, 1991/92 summer (COLAHAN 1992a).

Black Egret *Egretta ardesiaca*

Vagrant. During the years 1983-86 only one record was made in the 2926AB atlas grid (EARLE & GROBLER 1987); 1 ex., Soetdoring NR, 2.4.1994 (COLAHAN 1994b); 1 ex., Bloemfontein, 25.1.1994 (NUTTALL 1994a).

Grey Heron *Ardea cinerea*

Rare breeding resident at dams and rivers. In 1991/92 summer, a few nests were found at Olive Hills in Soetdoring NR (COLAHAN 1992a).

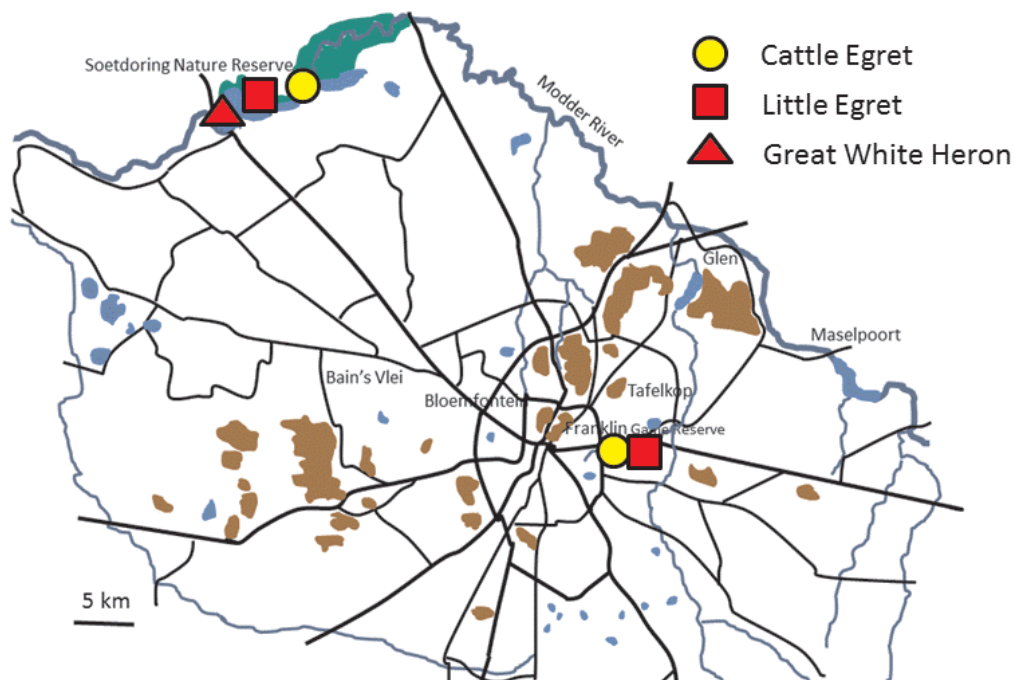


Fig. 19. Distribution of the heronries of the Great White Heron, Little Egret and Cattle Egret in the Bloemfontein area during the years 1993-2000.

Black-headed Heron *Ardea melanocephala*

Rare breeding resident at dams. In 1991/92, summer, a few pairs were recorded at Olive Hills in Soetdoring NR (COLAHAN 1992a).

Goliath Heron *Ardea goliath*

Very rare breeding resident at a large dam with fairly extensive reed beds. In 1972/73, summer, 4 nests were found at the Krugersdrift Dam (GELDENHUYS 1984). In 1993-2000, single pairs were breeding at Bishop Glen (GK). Largest recorded flock size: 30 exx. at the Krugersdrift Dam.

Purple Heron *Ardea purpurea*

Vagrant, possibly, a very rare breeding resident. During the years 1983-86, only one record was made in the 2826CD atlas grid (EARLE & GROBLER 1987); 1 exx., Rusfontein Dam, 12.1.1994 (COLAHAN 1994b); 1 ad. in reeds, Soetdoring NR (DE SWARDT 1998).

Cattle Egret *Bubulcus ibis* (Fig. 19)

Common breeding resident. Up to 'several hundred nests' at Olive Hills in Soetdoring NR, from 1972 (COLAHAN 1992a, KOPIJ & NUTTALL 1996); 4290 pairs, Thorngrove on the Modder River 1986-1992 (ROOS et al. 1986, KOPIJ & NUTTALL 1996); a heronry composed of 150 nests in 1995/96 summer, Oosteinde, known from 1952 (KOPIJ 1997b; KOPIJ & NUTTALL 1996). In the Soetdoring NR and Oosteinde, the species also nested during the years 1993-1997 (Fig. 8). The

staple food of birds breeding in Bloemfontein consisted of Acrididae (Orthoptera) and Diptera (KOPIJ 2003).

Squacco Heron *Ardeola ralloides*

Vagrant. Maselloort, 18.9.1988; Bloemfontein, 10-30.9.1988; 1 ex., Botanical Gardens, 5.6.1994 (NUTTALL 1994); 1 ex., Bishop Glen Dam, 26.11.1996 (DE SWARDT 1994).

Green-backed Heron *Butorides striata*

Probably, a very rare breeding resident. 1 ex., 2926AA, 13.7.1989 (DE SWARDT 1986); Modder River, 5.8.1989 (DE SWARDT 1990); 1 ex., Thorngrove on the Modder River, 27.11.1994 (ESTERHUIZEN 1994); 1 ad., Soetdoring NR, 16.5.1998 (DE SWARDT 1990).

Black-crowned Night Heron *Nycticorax nycticorax*

Rare breeding resident on the Modder River and at dams with clumps of weeping willows.

Little Bittern *Ixobrychus minutus* (Fig. 20)

Very rare breeding resident in extensive reed beds at dams and some rivers. During the years 1993-1997, two breeding sites were recorded: on the Modder River in Soetdoring NR and in Bishop Glen.

Dwarf Bittern *Ixobrychus sturmii* (Fig. 20)

Probably, a very rare breeding resident. 15.2.1991, Soetdoring NR (COLAHAN 1992a), where the species also nested in successive years.

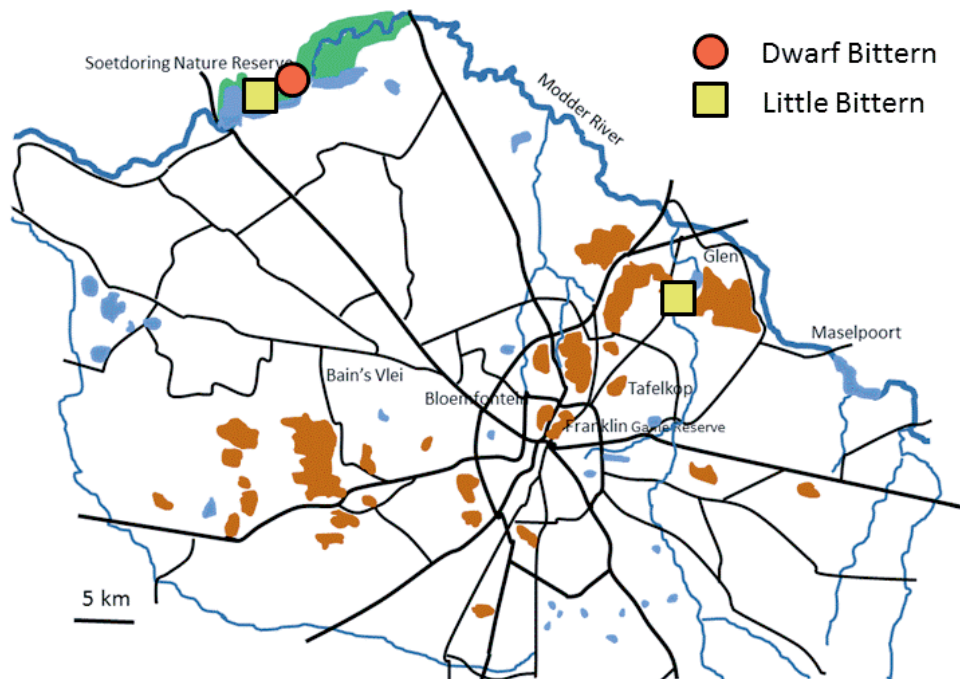


Fig. 20. Distribution of the breeding sites of the Little Bittern and Dwarf Bittern in the Bloemfontein area during the years 1993-2000.

SCOPIIDAE

Hamerkop *Scopus umbretta*

Fairly common breeding resident in rivers and at larger dams, usually in close proximity to human settlements. During the years 1993-1998, only one pair was recorded in 51 km² of Bloemfontein city (KOPIJ 2001); 0.5 pairs/10 km, on the Modder River (63 km transect) (KOPIJ 2000a); 2.7 pairs/10 km, Bloem Spruit in peri-urban environment (11 km transect) (KOPIJ 1997c). In the 1950's, up to 5 pairs nested in the Zoological Gardens in Bloemfontein (VAN EE1977).

PHOENICOPTERIDAE

Greater Flamingo *Phoenicopterus ruber*

Irregular visitor to dams and pans.

Lesser Flamingo *Phoenicopterus minor*

Irregular visitor to dams and pans, often in the company of Greater Flamingoes.

THRESKIORNITHIDAE

Glossy Ibis *Plegadis falcinellus*

Irregular visitor; breeding in the past. 10 pairs, Thorngrove, 9.1.1986 (ROOS et al. 1986). Largest flock: 73 exx., Glen, Feb. 1995 (KOPIJ & BUTLER 1996).

Hadedda Ibis *Bostrychia hagedash*

Fairly common breeding resident in well-timbered water courses and farmsteads. An expanding species, the first record in the Bloemfontein district was made in the middle of the 1970's (ROOS et al. 1985). During the years 1993-1998, 5 pairs were recorded in 51 km² of Bloemfontein city (KOPIJ 2001); 3.7 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a); Rhenoster River (15 km transect), 6.0 pairs/10 km (KOPIJ 2000a); 6.4 pairs/10 km, Bloem Spruit in peri-urban environment (KOPIJ 1997c).

Sacred Ibis *Threskiornis aethiopicus*

Regular visitor; breeding in the past. About 100 pairs, Thorngrove on the Modder River, 9.1.1986 (ROOS et al. 1986); a few nests, Olive Hills in Soetdoring NR, 1991/92 summer (COLAHAN 1992a).

African Spoonbill *Platalea alba*

Irregular visitor to large dams; breeding in the past. During the years 1972/73, 3 pairs nested at the Krugersdrift Dam (KOPIJ 1997a).

PELECANIDAE

White Pelican *Pelecanus onocrotalus*

Vagrant. 1 ex., Krugersdrift Dam, 31.12.1991 (COLAHAN 1992a); 3 exx., Krugersdrift Dam, 28.1.1992 (COLAHAN 1992a); 11 exx., Krugersdrift Dam, 28.2.1994 (COLAHAN 1994a); 1 exx., Rusfontein Dam, 7.11.1994 (NUTTALL 1994a); 1 exx., Rusfontein Dam, 22.1.1998 (NUTTALL 1998a).

Pink-backed Pelican *Pelecanus rufescens*

Vagrant. Only one bird was recorded during the years 1983-86 in the 2926 DA atlas grid (EARLE & GROBLER 1987).

CICONIIDAE

Yellow-billed Stork *Mycteria ibis* (Fig. 21)

Irregular visitor. Larger flocks: 31 exx., Soetdoring NR, 28.1.1992 (COLAHAN 1992a); 36 exx., Soetdoring NR, 17.1.1994 (COLAHAN 1994b).

White Stork *Ciconia ciconia*

Regular visitor from the Palearctic region. Winter records: 1 ex., 5.5.1984, Soetdoring NR (KRAMER & GROBLER 1984); 25 exx., S of Bloemfontein, 10.7.1985 (M. Basson). Largest flock size: 150 exx., Glen, Feb. 1995 (KOPIJ & BUTLER 1996).

Black Stork *Ciconia nigra*

Vagrant. During the years 1983-86, four records were made (EARLE & Grobler 1987); 1 ex., Botanical Gardens, 5.12.1993 (NUTTALL 1994b); 1 ex., Mexico (28°45'S, 27°25'E), 27.9.1997 (NUTTALL 1997).

Abdim's Stork *Ciconia abdimii*

Irregular summer visitor. Largest flocks recorded: 31 exx., Soetdoring NR, 28.1.1992 (COLAHAN 1992b); 36 exx., Soetdoring NR, 17.1.1994 (COLAHAN 1994b).

Marabou Stork *Leptoptilus crumeniferus*

Vagrant. 1 ex., Koppieskraal (30 km S of Bloemfontein), 8.12.1997 (NUTTALL 1997).



Fig. 21. Yellow-billed Stork (GK)

ORIOLIDAE

European Golden Oriole *Oriolus oriolus*
Vagrant from the Palearctic region.

DICRURIDAE

Fork-tailed Drongo *Dicrurus adsimilis*
Vagrant. Two records: during the years 1977-82 in the northern part of the Bloemfontein district (ROOS et al. 1985); 1 ex., 15.5.1995, Botanical Gardens in Bloemfontein (NUTTALL 1995a).

MONARCHIDAE

African Paradise-Flycatcher *Terpsiphone viridis*
Very rare breeding resident in luxuriant sub-urban vegetation.

MALACONOTIDAE

Brown-crowned Tchagra *Tchagra australis*
Irregular visitor. During the years 1983-86, c. 10 records were made (EARLE & GROBLER 1987).

Crimson-breasted Shrike *Laniarius atrococcineus*
Vagrant. During the years 1986-93, two records were made (EARLE & GROBLER 1987, COLAHAN 1993b).

Bokmakierie *Telophorus zeylonus*
Common breeding resident in *Acacia karroo* and *Olea-Buddleia* vegetation, and well-timbered suburbs. Density: 87 pairs/50 km², Bloemfontein city, 1995-97, including 9-14.5 p/175 ha in UFS campus grassland (KOPIJ 1999a); 8 pairs/6.7 km, *Olea-Buddleia* vegetation (KOPIJ 2013); 5.7 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 10.8 pairs/10 km, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a); 7.0 pairs/10 km, *Acacia karroo* near Tafelkop and Glen (10 km transect) (KOPIJ 2000b); 13.1 pairs/10 km, *Olea-Buddleia* hills near Tafelkop and Glen (KOPIJ 2000b); 9.1 pairs/10 km, Bloem Spruit in peri-urban environment (11 km transect) (KOPIJ 1997c); Bainsvlei farmland, dominance: 3.1% (KOPIJ 1998a).

Chin-sopt Batis *Batis molitor*
Vagrant. During the years 1983-86, 3 records (EARLE & GROBLER 1987).

Pririt Batis *Batis pririt*
Rare breeding resident in *Acacia karroo* and *Olea-Buddleia* vegetation. Density: 1.4 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a).

Fairy Flycatcher *Stenostira scita*
Rare breeding resident in *Olea-Buddleia* vegetation.

CORVIDAE

Cape Crow *Corvus capensis*
Vagrant. During the years 1977-82, not recorded (ROOS et al. 1985); 1983-86, three records (EARLE & GROBLER 1987).

Pied Crow *Corvus albus*
Rare breeding resident in farmlands.

LANIIDAE

Red-backed Shrike *Lanius collurio*
Irregular Palearctic visitor in bushy habitats, especially in open *Acacia karroo* vegetation. During the years 1983-86, c. 10 records were made (EARLE & GROBLER 1987).

Common Fiscal *Lanius collaris*
Very common breeding resident in *Acacia karroo* and *Olea-Buddleia* vegetation and in suburbs. Density: 1.6 pairs/100 ha, Bloemfontein city centre (123 ha) (KOPIJ 1996); 14 pairs/55 ha, UFS campus, 1993 (KOPIJ 1994); 3.8 pairs/10 ha, Zoological Gardens (8 ha) (KOPIJ 1999e); 9.6 pairs/10 km *Olea-Buddleia* vegetation (175 ha) (12 km transect) (KOPIJ 2013); 21-34 pairs/100 ha, peri-urban grassland on the UFS campus (KOPIJ 1999d); 89 pairs/10 km², Bloemfontein city (51 km²) (KOPIJ 2015); 5.5 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 8.0 pairs/10 km, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a); 6.3 pairs/10 km, *Acacia karroo* near Tafelkop and Glen (10 km transect) (KOPIJ 2000b); 2.9 pairs/10 km, *Cymbopogon-Themeda* grassland in the Kaal Spruit valley (7 km transect) (KOPIJ 2000b); 20.9 pairs/10 km, Bloem Spruit in peri-urban environment (KOPIJ 1997c); Bainsvlei, 5.4%, dominance (KOPIJ 1994). One bird, ringed in March 1989 in the Botanical Gardens in Bloemfontein, was recaptured at the same site in September 2001 after 12 years and 7 months (DE SWARTDT 2003).

PARIDAE

Cape Penduline-Tit *Anthoscopus minutus*
Rare breeding resident in *Acacia karroo* vegetation.

Ashy Tit *Parus cinerascens*
Rare breeding resident in *Acacia karroo* vegetation, in the northern part of the district. Density: 0.5 pairs/10 km, *Acacia karroo* on Modder River (63 km transect) (KOPIJ 2000a).

HIRUNDINIDAE

Banded Martin *Riparia cincta*

Regular visitor to sand river cliffs, mostly on the Modder River.

Brown-throated Martin *Riparia paludicola*

Fairly common breeding resident in large dongas and sandy river cliffs, mostly on the Modder River.

Barn Swallow *Hirundo rustica*

Regular summer visitor from the Palearctic region. In January, 1993-97, a roosting flock of a few thousands birds was recorded in Bloemfontein, in Universitas and on the UFS campus (NUTTALL 1998c, 2000, 2003). In February 1997, the flock was estimated at 10 000 (NUTTALL 1997). A large roosting flock was also recorded in a reedbed at Two-Bob-a-Day on the Modder River, c. 20 km E of Bloemfontein, with 1000-2000 birds in 2001/2002, summer (NUTTALL 2003). During the years 1998-2003, a total of 15298 swallows were ringed in Bloemfontein; and 48 captured birds were those ringed in Europe, mainly from the UK (N=24), Norway (N=10) and Finland (N=6); one was from Poland (NUTTALL 2000, 2003). Dates of departure: 18.03.2001, 09.04.2002, 04.04.2003 (NUTTALL 2003).

White-throated Swallow *Hirundo albogularis*

Fairly common intra-African migrant. It nests under bridges. Density: 1.1 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a).

Pearl-breasted Swallow *Hirundo dimidiata*

Vagrant. During the years 1983-86, 8 records, mainly on the Modder River near Glen (EARLE & GROBLER 1987).

Greater Striped Swallow *Hirundo cucullata*

Common intra-African migrant; in human settlements. Densities: 15 pairs/10km², Bloemfontein city, 51 km² (KOPIJ 2015). Date of arrival: 16.9.1992 (NUTTALL 1992a); one record in winter: 8.5.1994 in Bloemfontein (NUTTALL 1994a).

Lesser Striped Swallow *Hirundo abyssinica*

Vagrant in summer. Recorded only during the years 1977-82 (ROOS et al. 1985).

Red-breasted Swallow *Hirundo semirufa*

Fairly common breeding resident. It usually nests in large pipes under roads, sometimes under bridges.

South African Cliff Swallow *Hirundo spilodera* (Fig. 22)

Very common intra-African migrant. It nests in large colonies under bridges. In the middle of 1985, 18 colonies were known in the district (EARLE 1985, 1987). Most of these colonies were

South African Cliff Swallow

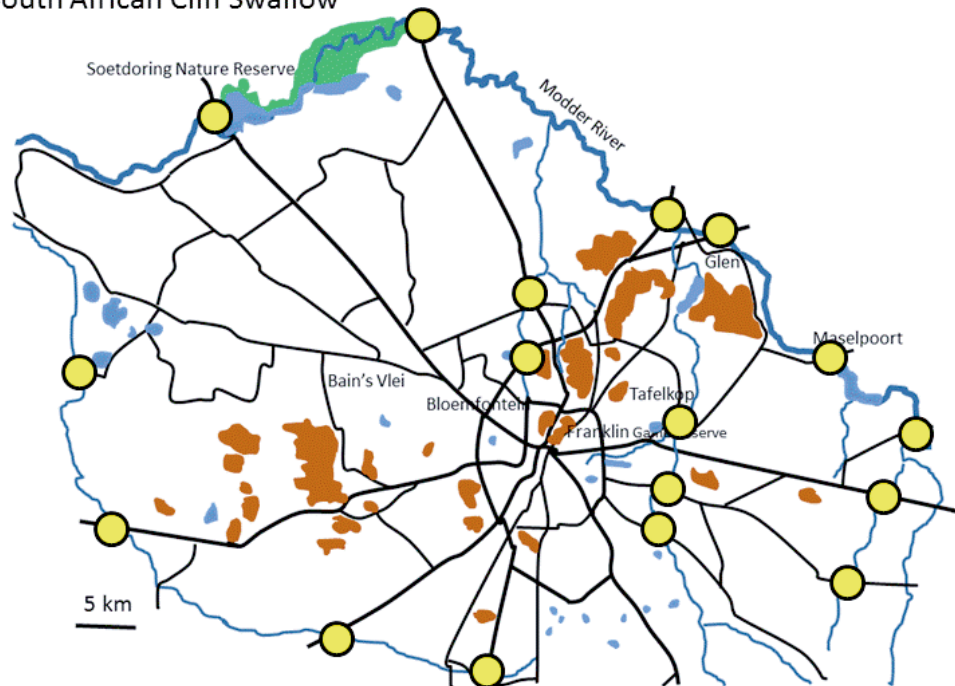


Fig. 22. Distribution of the breeding colonies of the South African Cliff Swallow in the Bloemfontein area during the years 1993-2000.

also occupied during the years 1993-2000. Density: 61.5 pairs/10 km, eudominant, Modder River (63 km transect) (KOPIJ 2000a); 16.0 pairs/10 km, Rhenoster River (15 km transect) (KOPIJ 2000a); c. 1500 pairs, eudominant, Kaal Spruit (7 km) (KOPIJ 2000b). Arrival: beginning of August (EARLE & BROOKE 1988, GROBLER 1988). About 30 exx., overwintered at Schoonzicht, 35 km SW of Bloemfontein (EARLE & BROOKE 1988).

Rock Martin *Hirundo fuligula*

Common breeding resident in eroded river banks; rare in the suburbs. Density: 1.9 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015); 45.5 pairs/10 km, as dominant Modder River (63 km transect) (KOPIJ 2000a); 49.2 pairs/10 km, Rhenoster River (15 km transect) (KOPIJ 2000a); 127.3 pairs/10 km, as a dominant (15.9%), Bloem Spruit in peri-urban environment (KOPIJ 1997c).

Common House-Martin *Delichon urbicum*

Irregular summer visitor.

PYCNONOTIDAE

Dark-capped Bulbul *Pycnonotus barbatus*

Vagrant. During the years 1983-86, eight records were made around Bloemfontein (EARLE & GROBLER 1987).

Red-eyed Bulbul *Pycnonotus nigricans*

Very common breeding resident in *Acacia karroo*, *Olea-Buddleia* vegetation, and suburbs. Density: 3.3 pairs/100 ha, Bloemfontein city centre (123 ha) (KOPIJ 1996); Bloemfontein city (51 km²): 198 pairs/10km² (KOPIJ 2015); 18.5 pairs/55 ha, UFS campus suburbs (KOPIJ 1994); 34 pairs/6.7 km, as a dominant *Olea-Buddleia* vegetation (12 km transect) (KOPIJ 2013); 6.8 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 3.0 pairs/10 km, *Acacia karroo* near Tafelkop and Glen (10 km transect) (KOPIJ 2000b); 10.1 pairs/10 km, *Olea-Buddleia* hills near Tafelkop and Glen (KOPIJ 2000b); Bainsvlei farmland, dominance: 2.0% (KOPIJ 1998). One of the most frequently captured bird species (4.8% out of 1311 captures for ringing) in the Botanical Gardens in Bloemfontein (DE SWARDT et al. 2004).

SYLVIDAE

Fairy Flycatcher *Stenostira scita*

Fairly common breeding resident. Density: 4-6 pairs, Bloemfontein city (51 km²) (KOPIJ 2001).

Cape Grassbird *Sphenoeacus afer*

Vagrant. During the years 1983-86, only one record was made (EARLE & GROBLER 1987); No-

vember 1988 in the 2926AA atlas grid (WESSELS 1988).

Long-billed Crombeck *Sylvietta rufescens*

Rare breeding resident in *Acacia karroo* and *Olea-Buddleia* vegetation.

Yellow-bellied Eremomela *Eremomela icteropygialis*

Rare breeding resident in bushy vegetation.

Little Rush Warbler *Bradypterus baboecala*

Vagrant. During the years 1993-2005, only one record was made at Bishop Glen (DE SWARDT et al. 2005).

Sedge Warbler *Acrocephalus schoenobaenus*

Irregular summer visitor from the Palearctic region. In total, 32 birds were captured for ringing (N= 10944 of all captured birds) at Bishop Glen during the years 1993-2005 (DE SWARDT et al. 2005). Extreme dates: Bishop Glen, 26.11.1994; Bishop Glen, 12.03.1994 (NUTTALL 1994b).

African Reed-Warbler *Acrocephalus baeticatus*

Very common breeding resident in reed beds along rivers. Density: 11.4 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a); 22.4 pairs/10 km, as subdominant, Rhenoster River (15 km transect) (KOPIJ 2000a). The species comprised 4.0% of birds captured for ringing (N= 10944) during the years 1993-2005 at Bishop Glen (DE SWARDT et al. 2005).

Marsh Warbler *Acrocephalus palustris*

Vagrant from the Palearctic region. During the years 1983-86, two records were made (EARLE & GROBLER 1987); 18.1.1987, Rhenoster River (PENRY 1988). A doubtful record at the Zoo in Bloemfontein (VAN EE 1987, PENRY 1988).

Great Reed Warbler *Acrocephalus arundinaceus*

Irregular summer (September-March) visitor from the Palearctic region. During the years 1983-86, only three records were made (EARLE & GROBLER 1987); 26.11.1994, Bishop Glen Dam (DE SWARDT 1994). 12 birds were captured for ringing (N= 10944) at Bishop Glen during the years 1993-2005 (DE SWARDT et al. 2005).

Lesser Swamp-Warbler *Acrocephalus gracilirostris*

Common breeding resident in reeds along rivers and dams. Density: 1.8 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a); 5.7 pairs/10 km, Kaal Spruit (7 km transect) (KOPIJ 2000b). It comprised 1.0% of birds captured for ringing (N=10944) at Bishop Glen during the years 1993-2005 (DE SWARDT et al. 2005).

Icterine Warbler *Hippolais icterina*

Vagrant from the Palearctic region. During the years 1977-82, the species was not recorded (ROOS et al. 1985); 1983-86, 2 records (EARLE & GROBLER 1987); 1993-1997: Rusfontein Dam NR (COLAHAN 1993b).

Willow Warbler *Phylloscopus trochilus*

Irregular summer visitor from the Palearctic region. Extreme dates: September-April; one doubtful record from July (EARLE & GROBLER 1987). There were 0.15% Willow Warblers out of 1311 birds captured for ringing during the years 1985-2004 in the Botanical Gardens in Bloemfontein (DE SWARDT et al. 2004). Only four birds were captured for ringing (N=10944 all captured birds) at Bishop Glen during the years 1993-2005 (DE SWARDT et al. 2005).

Layard's Warbler *Sylvia layardi*

Vagrant. Botanical Gardens, 1986 (GROBLER 1986).

Chestnut-vented Warbler *Sylvia subcaerulea*

Very common breeding resident in *Acacia karroo* and *Olea-Buddleia* vegetation, and in Bloemfontein suburbs. Density: one of the most common breeding residents in the Franklin GR, in *Olea-Buddleia* vegetation 23 pairs/6.7 km (KOPIJ & DE SWARDT 1998b; KOPIJ 2013); 18 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015); 17.1 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 12.0 pairs/10 km, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a); 23.0 pairs/10 km, as dominant, *Acacia karroo* near Tafelkop and Glen (10 km transect), (KOPIJ 2000b); 16.2 pairs/10 km, as dominant, *Olea-Buddleia* hills near Tafelkop and Glen (KOPIJ 2000b); 7.3 pairs/10 km, Bloem Spruit in peri-urban environment (11 km transect) (KOPIJ 1997c).

Garden Warbler *Sylvia borin*

Vagrant from the Palearctic region. During the years 1983-86, seven records were made (EARLE & GROBLER 1987). Extreme dates: October-March.

ZOSTEROPIDAE

Cape White-eye *Zosterops virens* / Orange River White-eye *Zosterops pallidus*

Very common breeding resident in *Acacia karroo* and *Olea-Buddleia* vegetation, and in the suburbs. Density: 8.1 pairs/100 ha, Bloemfontein city centre (123 ha) (KOPIJ 1996); 10.0 pairs/10 ha, Zoological Gardens (8 ha) (KOPIJ 1999e); 192 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015); 10 pairs/123 ha, Bloemfontein city centre (KOPIJ

1996); 20 pairs/55 ha, UFS campus suburbs (KOPIJ 1994); 17 pairs/6.7 km, *Olea-Buddleia* vegetation at Franklin GR (KOPIJ 2013); 10.3 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 6.0 pairs/10 km, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a); 10.0 pairs/10 km, Bloem Spruit in peri-urban environment (11 km transect) (KOPIJ 1997c). The most frequently captured bird species (26.5% out of 1311 captures for ringing) in the Botanical Gardens in Bloemfontein (DE SWARDT et al. 2004). The species comprised 0.9% of birds captured for ringing during the years 1993-2005 (N= 10944, incl. 7146 Red-billed Quelea) at Bishop Glen (DE SWARDT et al. 2005). In Bloemfontein, its main diet in the winter consisted of the fruits of *Bequaertiodendron megalismontana* (KOPIJ 2000c).

CISTICOLIDAE

Grey-backed Cisticola *Cisticola subruficapilla*

Rare breeding resident in *Olea-Buddleia* vegetation. It was not recorded during the years 1977-82, (ROOS et al 1985); and only one record was made during the years 1983-86 (EARLE & GROBLER 1987).

Levaillant's Cisticola *Cisticola tinniens*

Common breeding resident in vleis and river banks. Density: 6.0 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 9.2 pairs/10 km, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a); 15.7 pairs/10 km, *Cymbopogon-Themeda* grassland in the Kaal Spruit valley (7 km transect) (KOPIJ 2000b). It comprised 2.9% of birds captured for ringing (N= 10944) during the years 1993-2005 at Bishop Glen (DE SWARDT et al. 2005).

Neddicky Cisticola *Cisticola fulvicapilla*

Very common breeding resident in *Acacia karroo* and *Olea-Buddleia* vegetation and other bushy habitats. Density: 3.1 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015); 1.7 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 4.0 pairs/10 km, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a); 10.1 pairs/10 km, *Olea-Buddleia* hills near Tafelkop and Glen (KOPIJ 2000b).

Zitting Cisticola *Cisticola juncidis*

Common breeding resident in grasslands. Density: 4.0 pairs/10 km *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a).

Desert Cisticola *Cisticola aridulus*

Fairly common breeding resident in grasslands.

Cloud Cisticola *Cisticola textrix*

Very common breeding resident in grasslands. Density: 20.0 pairs/10 km, *Cymbopogon-Themeda* grassland in the Kaal Spruit valley (7 km transect) (KOPIJ 2000b).

Wing-snapping Cisticola *Cisticola ayersii*

Rare breeding resident in grassland.

Black-chested Prinia *Prinia flavicans*

Very common breeding resident in *Acacia karroo*, *Olea-Buddleia*, *Cymbopogon-Themeda* vegetation, in farmlands and suburbs. Density: 14 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015); 22 pairs/6.7 km, *Olea-Buddleia* vegetation at Franklin GR (KOPIJ 2013); 30.8 pairs/10 km, as subdominant, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 26.4 pairs/10 km, as subdominant, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a); 11.0 pairs/10 km, as dominant, *Acacia karroo* near Tafelkop and Glen (10 km transect) (KOPIJ 2000b); 10.0 pairs/10 km, *Cymbopogon-Themeda* grassland in the Kaal Spruit valley (7 km transect), (KOPIJ 2000b); 10.1 pairs/10 km, *Olea-Buddleia* hills near Tafelkop and Glen (KOPIJ 2000b); 31.8 pairs/10 km, Bloem Spruit in peri-urban environment (11 km transect) (KOPIJ 1997c); Bainsvlei farmlands, dominance: 2.5% (KOPIJ 1998). It comprised 3.9% of 1311 birds captured for ringing in the Botanical Gardens in Bloemfontein during the years 1985-2004 (DE SWARDT et al. 2004).

Karoo Prinia *Prinia hypoxantha*

Rare breeding resident in dry *Acacia karroo*.

Rufous-eared Warbler *Malcorus pectoralis*

Very rare breeding resident in karroid vegetation. 1 ex., 26.11.1995, Florisbad (DE SWARDT 1994).

Bar-throated Apalis *Apalis thoracica*

Vagrant. During the years 1983-87, one record was made in the 2926AC atlas grid (EARLE & GROBLER 1987).

ALAUDIDAE

Melodious Lark *Mirafra cheniana*

Vagrant. Only one record during the years 1983-88, in the 2826CC atlas grid (EARLE & GROBLER 1987).

Rufous-naped Lark *Mirafra africana*

Fairly common breeding resident in grasslands and farmlands. Mainly in the northern part.

Eastern Clapper Lark *Mirafra fasciolata*

Very common breeding resident in grasslands. Density: 11.4 pairs/10 km, *Cymbopogon-Themeda*

grassland in the Kaal Spruit valley (7 km transect) (KOPIJ 2000b).

Sabota Lark *Calendulauda sabota*

Rare breeding resident in dry *Acacia karroo* vegetation, in the western part of the study area.

Fawn-coloured Lark *Calendulauda africanoides*

Probably, a rare breeding resident.

Karoo Lark *Calendulauda albescens*

Vagrant. Recorded only during the years 1983-88; a single record was made in the southern part of the district (EARLE & GROBLER 1987).

Spike-heeled Lark *Chersomanes albofasciata*

Fairly common breeding resident in grasslands, especially overgrazed grasslands.

Eastern Long-billed Lark *Certhilauda semitorquata*

Vagrant. Recorded only during the years 1983-86: two records (EARLE & GROBLER 1987).

Short-clawed Lark *Certhilauda chuana*

Vagrant. Only during the years 1983-86, two records were made in the 2826CC atlas grid (EARLE & GROBLER 1987).

Chestnut-backed Sparrowlark *Eremopterix leucotis*

Rare breeding nomadic in dry grassland, mainly in the southern part of the district.

Grey-backed Sparrowlark *Eremopterix verticalis*

Rare breeding resident in dry grasslands in the western part of the district.

Red-capped Lark *Calandrella cinerea*

Common breeding resident in grasslands, especially overgrazed grasslands; also in farmlands.

Pink-billed Lark *Spizocorys canirostris*

Vagrant. Only during the years 1983-86, one record was made in Bloemfontein (EARLE & GROBLER 1987).

Large-billed Lark *Galerida magnirostris*

Vagrant, possibly a very rare breeding resident in karroid vegetation. During the years 1983-86, 4 records were made (EARLE & GROBLER 1987).

MUSCICAPIDAE

Cape Rock Thrush *Monticola rupestris*

Vagrant. One record from the period 1983-1985 (LOOCK 1985).

Short-toed Rock Thrush *Monticola brevipes*

Vagrant. During the years 1983-87, two records were made (EARLE & GROBLER 1987).

Ground-scraper Thrush *Psophocichla litsitsirupa*

A very rare, and irregular breeding resident. A few pairs probably nested in Bloemfontein during the years 1983-86 (FARKAS 1984, EARLE & GROBLER 1987).

Karoo Thrush *Turdus smithi*

Common breeding resident in *Acacia karroo* and *Olea-Buddleia* vegetation, and suburbs. Density: 10.5 pairs/55 ha, UFS campus suburbs (KOPIJ 1994); 6.3 pairs/10 ha, Zoological Gardens (8 ha) (KOPIJ 1999e); 16 pairs/123 ha, Bloemfontein city centre (KOPIJ 1996); 7 pairs/6.7 km, *Olea-Buddleia* vegetation, (12 km transect) (KOPIJ 2013); 6.8 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 4.8 pairs/10 km, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a); 4.5 pairs/10 km, Bloem Spruit in peri-urban environment (11 km transect) (KOPIJ 1997b). The most frequently captured bird species (11.0% out of 1311 captures for ringing) in the Botanical Gardens in Bloemfontein (DE SWARDT et al. 2004). In Bloemfontein, its main diet in the winter consisted of the fruits of *Celtis africana* (KOPIJ 2000c).

Marico Flycatcher *Bradornis mariquensis*
Vagrant.

Fiscal Flycatcher *Sigelus silens*

Common breeding resident in bushy habitats, farmland and urban habitats. Density: 2.7 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015); 8 pairs/6.7 km, *Olea-Buddleia* vegetation (KOPIJ 2013); 10.8 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 5.2 pairs/10 km, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a); 6.0 pairs/10 km, *Acacia karroo* near Tafelkop and Glen (10 km transect) (KOPIJ 2000b).

Spotted Flycatcher *Muscicapa striata*

Regular summer visitor from the Palearctic region; occurs in low numbers in luxuriant exotic tree vegetation. During the years 1950-86 (N=36 years), arrival was between the 3rd and 30th of November, mostly in the second half of the month (on average the 21st of November), departure was between the 17th and the 26th of March (on average the 21st of March) (KOK et al. 1991).

Dusky Flycatcher *Muscicapa adusta*

Vagrant. During the years 1983-86, 4-5 records were made (EARLE & GROBLER 1987).

Cape Robin-Chat *Cossypha cafra*

Very common breeding resident in bushy vegetation, both exotic and indigenous, on farmsteads and in suburbs. Density: 3.3 pairs/100 ha, Bloemfontein city centre (123 ha) (KOPIJ 1996); 3.8 pairs/10 ha, Zoological Gardens (8 ha) (KOPIJ 1999e); 83 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015); 10 pairs/44 ha, UFS campus (KOPIJ 1994); 11 pairs/6.7 km, *Olea-Buddleia* vegetation in Franklin GR (12 km transect) (KOPIJ 2013); 24.2 pairs/10 km, as subdominant, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 13.2 pairs/10 km, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a); 15.5 pairs/10 km, Bloem Spruit in peri-urban environment (KOPIJ 1997c). It comprised 3.9% of 1311 birds captured for ringing during the years 1985-2004 in the Botanical Gardens in Bloemfontein (DE SWARDT et al. 2004).

Kalahari Scrub-Robin *Cercotrichas paeana*

Rare breeding resident in *Acacia karroo* and *Olea-Buddleia* vegetation, in northern and eastern parts of the district. Density: 2.8 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 8.0 pairs/10 km, *Acacia karroo* near Tafelkop and Glen (10 km transect) (KOPIJ 2000b).

Karoo Scrub-Robin *Cercotrichas coryphaeus*

Fairly common breeding resident in *Acacia karroo* and *Olea-Buddleia* vegetation, and suburbs. Density: Bloemfontein city (51 km²): 0.8 pairs/10km² (KOPIJ 2015); 0.6 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a).

African Stonechat *Saxicola torquatus*

Fairly common breeding resident in grasslands and farmlands, mainly in the eastern part of the district. Density: 1.4 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 10.0 pairs/10 km, *Cymbopogon-Themedra* grassland in the Kaal Spruit valley (7 km transect) (KOPIJ 2000b).

Mountain Wheatear *Oenanthe monticola*

Rare breeding resident in karroid vegetation.

Capped Wheatear *Oenanthe pileata*

Rare breeding resident in short grasslands.

Sickle-winged Chat *Cercomela sinuata*

Rare breeding resident in karroid vegetation.

Karoo Chat *Cercomela schlegelii*

Vagrant. 1 ex. was collected (now in Transvaal Museum, Pretoria), Bloemfontein, January 1889 (FARKAS 1984). Four records were made during the years 1983-86 (EARLE & GROBLER 1987).

Tractrac Chat *Cercomela tractrac*

Vagrant.

Familiar Chat *Cercomela familiaris*

Fairly common breeding resident on dry and eroded land. Density: 0.8 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015).

Ant-eating Chat *Myrmecocichla formicivora*

Common breeding resident in grasslands with large numbers of termite mounds. Density: 2.9 pairs/10 km, *Cymbopogon-Themedra* grassland in the Kaal Spruit valley (7 km transect) (KOPIJ 2000b).

Mocking Cliff-Chat *Thamnolaea cinnamomeiventris*

Very rare breeding resident in bushy vegetation. During the years 1977-82, it was recorded in the eastern part of the district (ROOS et al. 1985); one record in the 2825DD atlas grid during the years 1983-86 (EARLE & GROBLER 1987); a female was recorded on 27.2.1992 in a garden around Rusfontein Dam NR (COLAHAN 1992b).

STURNIDAE

Red-winged Starling *Onychognathus morio*

Rare breeding resident in suburbs of Bloemfontein. Density: four pairs were recorded in 51 km² of Bloemfontein city (KOPIJ 2001).

Glossy Starling *Lamprotornis nitens*

Fairly common breeding resident. Density: 5 pairs per 51 km², Bloemfontein city (KOPIJ 2001).

Burchell's Starling *Lamprotornis australis*

Vagrant. During the years 1983-86, 3 records were made in the 2826CC atlas grid (EARLE & GROBLER 1987).

Pied Starling *Spreo bicolor*

Common breeding resident in eroded river banks, large dongas, and farmsteads. Density: 6.2 pairs/10 km, on the Modder River (63 km transect) (KOPIJ 2000a); 4.0 pairs/10 km, Rhenoster River (15 km transect) (KOPIJ 2000a); 14.5 pairs/10 km, Bloem Spruit in peri-urban environment (KOPIJ 1997c).

Wattled Starling *Creatophora cinerea*

Regular winter visitor to urban habitats, and farmland. In Bloemfontein, its main food in the winter is composed of the fruits of *Celtis africana* and *Ligustrum vulgare* (KOPIJ 2000c).

Common Starling *Sturnus vulgaris*

Rare breeding resident in clumps of poplar and willows and other broad-leaved exotic trees. An expanding, alien and invasive species: the first record in the Bloemfontein area was made on Bloemspruit in October 1990 (COLAHAN 2000), followed by another record in Maselpoort on 1.7.1993 (NUTTALL 1993a). In the late 1990's it

was established around the Loch Logan and Oosteinde in Bloemfontein (DE SWARDT 2017).

Common Myna *Acridotheres tristis*

Very rare breeding resident in urban habitat. An expanding, alien and invasive species. The first record in the Bloemfontein area was made in 1998 in Glen and Oosteinde in Bloemfontein (DE SWARDT 2017), followed by another record of 2-4 individuals on 4.6.1999 in Bloemfontein (NUTTALL 1999b).

NECTARINIIDAE

Amethyst Sunbird *Chalcomitra amethystina*

Very rare breeding resident. During the years 1983-86, 3 records were made (EARLE & GROBLER 1987).

Malachite Sunbird *Nectarinia famosa*

Rare breeding resident in *Olea-Buddleia* vegetation; wintering in the suburbs of Bloemfontein (DE SWARDT 2001). One juvenile bird ringed on 19.04.1993 in the Botanical Gardens in Bloemfontein was recaptured in exactly the same site of a *Leonotus leonurus* clump on 22.04.2003 (DE SWARDT 2003). It comprised 11.2% of 1311 birds captured for ringing in the Botanical Gardens in Bloemfontein during the years 1985-2004 (DE SWARDT et al. 2004).

White-bellied Sunbird *Cinnyris talatala*

Irregular visitor to suburbs of Bloemfontein. During the years 1983-86, one record (July) was made in the 2926AA atlas grid (EARLE & GROBLER 1987). It comprised 4.2% of 1311 birds captured for ringing during the years 1985-2004 in the Botanical Gardens in Bloemfontein (DE SWARDT et al. 2004).

Dusky Sunbird *Cinnyris fusca*

Very rare, and irregular, breeding resident. On 8.9.1985 a nest with two chicks was found on *Opuntia* in a garden in a Bloemfontein suburb (GROBLER & PRETORIUS 1986); a female was recorded on 2.7.1995 in Bloemfontein (NUTTALL 1995b).

PLOCEIDAE

Scaly-feathered Finch *Sporopipes squamifrons*

Fairly common breeding resident in dry *Acacia karroo* vegetation. It occurs all over the district, especially in the southern and western parts. Density: 6.3 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a).

White-browed Sparrow-Weaver *Plocepasser mahali*

Common breeding resident in *Acacia karroo* vegetation, and on some farmsteads. Density:

7.1 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 6.0 pairs/10 km, *Acacia karroo* near Tafelkop and Glen (10 km transect) (KOPIJ 2000b).

Cape Weaver *Ploceus capensis*

Rare breeding resident in exotic trees, usually in close proximity to water in suburbs. Density: six breeding sites were recorded in 51 km² of Bloemfontein city (KOPIJ 2001).

Southern Masked Weaver *Ploceus velatus*

Very common breeding resident in *Acacia karroo* and *Olea-Buddleia* vegetation, suburbs and farmlands, usually close to water bodies. Nests located mainly in *Acacia* spp., *Phoenix canarensis*, *Cedrus atlantica* (KOPIJ 1999c). Density: 15.5 nesting sites/10 ha, Bloemfontein city centre (123 ha) (KOPIJ 1996); 6.3 nesting sites/10 ha, Zoological Gardens (8 ha) (KOPIJ 1999d); 163 pairs/10km², Bloemfontein city (51 km²): (KOPIJ 2015); 15 nesting sites/55 ha, UFS campus suburbs (KOPIJ 1994); 17 nesting sites/123 ha, Bloemfontein city center, 1994-98 (KOPIJ 1999a); *Olea-Buddleia* vegetation, 4 sites/6.7 km (KOPIJ 2013); *Acacia karroo* on the Modder River (63 km transect), 34.2 pairs/10 km, as subdominant (KOPIJ 2000a); *Acacia karroo* on the Rhenoster River (15 km transect), 26.4 pairs/10 km, as subdominant (KOPIJ 2000a); *Cymbopogon-Themedra* grassland in the Kaal Spruit valley (7 km transect), 11.4 pairs/10 km (KOPIJ 2000b); 53.6 pairs/10 km, as a dominant (6.7%), Bloem Spruit in peri-urban environment (KOPIJ 1997c); 2.9%, dominance, Bainsvlei intensively-managed farmlands (KOPIJ 1998a). The second most frequently (16.3%) captured bird species for ringing during the years 1993-2005 (N= 10944 captured for ringing) at Bishop Glen (DE SWARTDT et al. 2005).

Village Weaver *Ploceus cucullatus*

Vagrant. During the years 1983-86, 2 records were made (EARLE & GROBLER 1987).

Red-billed Quelea *Quelea quelea*

Very common breeding nomad. The most frequently (62.3%) captured bird species for ringing during the years 1993-2005 (N= 10944 all birds captured for ringing) at Bishop Glen (GROBLER 1998, DE SWARTDT et al. 2005).

Yellow-crowned Bishop *Euplectes afer*

Fairly common breeding resident in rushes and sedges in vleis. Density: 4.5 pairs/10 km, Bloem Spruit in peri-urban environment (KOPIJ 1997c).

Southern Red Bishop *Euplectes orix*

Very common breeding resident in reeds along water courses and at dams. Density: up to 12-15 breed-

ing sites, Bloemfontein city centre (123 ha) (KOPIJ 1999b); 14 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015); 49.8 pairs/10 km, as dominant, on the Modder River (63 km transect) (KOPIJ 2000a); 36.0 pairs/10 km, the most common species, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a); 271.4 pairs/10 km, as eudominant, *Cymbopogon-Themedra* grassland in the Kaal Spruit valley (7 km transect) (KOPIJ 2000b); 154.3 pairs/10 km, the most common species, Bloem Spruit in peri-urban environment (11 km transect) (KOPIJ 1997c). The second most frequently captured bird species (14.0% out of 1311 captures for ringing) in the Botanical Gardens in Bloemfontein (DE SWARTDT et al. 2004).

Yellow Bishop *Euplectes capensis*

Vagrant. During the years 1983-86, 2 records were made in the 2826CC and 2926AB atlas grids (EARLE & GROBLER 1987).

White-winged Widowbird *Euplectes albonotatus*

Vagrant. 3-4 males recorded on 21.3.1998 in Sotdoring NR (DE SWARTDT 1998).

Red-collared Widowbird *Euplectes ardens*

Vagrant. During the years 1983-86, one record was made in the 2926AB atlas grid (EARLE & GROBLER 1987).

Long-tailed Widowbird *Euplectes prognus*

Fairly common breeding resident in long grass, especially in vleis. Density: 2.2 pairs/10 km, on the Modder River (63 km transect) (KOPIJ 2000a); 18.6 pairs/10 km, *Cymbopogon-Themedra* grassland in the Kaal Spruit valley (7 km transect) (KOPIJ 2000b).

ESTRILDIDAE

Orange-breasted Waxbill *Sporaeoginthus subflavus* (Fig. 23)

Rare breeding resident at dams with extensive reed-belts. A few pairs at Bishop Glen Dam and on the Modder River near Maselpoort. Density: 6.4 pairs/10 km, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a). It comprised 0.6% of birds captured for ringing during the years 1993-2005 (N= 10944, incl. 7146 Red-billed Quelea) at Bishop Glen (DE SWARTDT et al. 2005).

African Quailfinch *Ortygospiza atricollis*

Common breeding resident in farmlands and short grass. Density: 25.7 pairs/10 km, *Cymbopogon-Themedra* grassland in the Kaal Spruit valley (7 km transect) (KOPIJ 2000b).

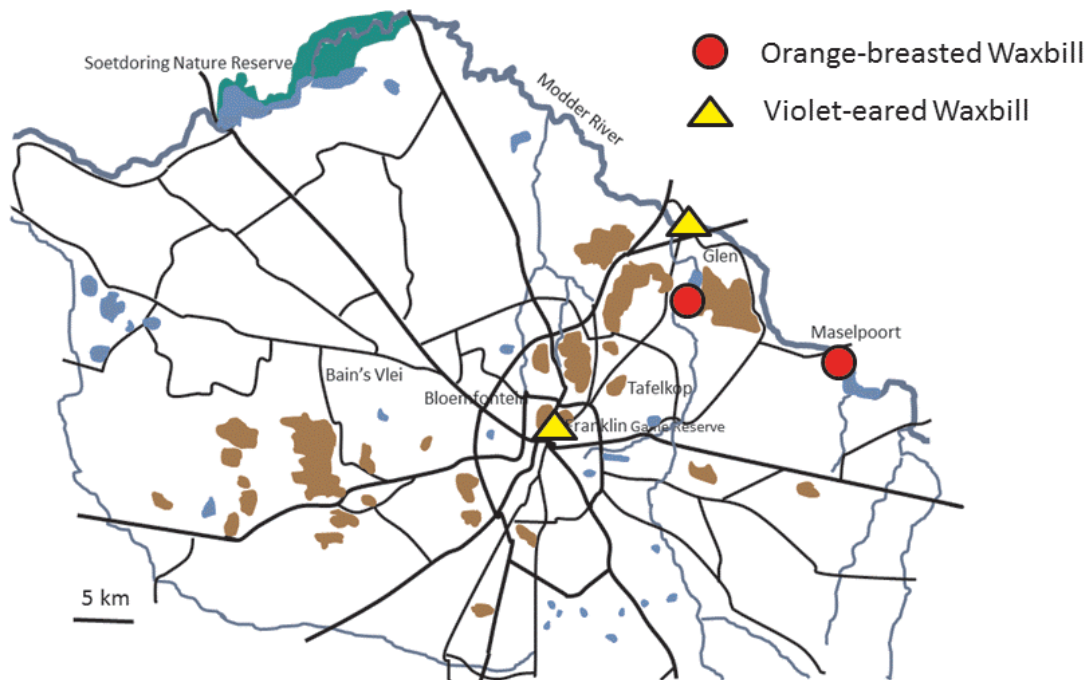


Fig. 23. Distribution of the breeding sites of the Orange-breasted Waxbill and Violet-eared Waxbill in the Bloemfontein area during the years 1993-2000.

Red-headed Finch *Amadina erythrocephala*

Fairly common breeding resident. First record in the Bloemfontein district was made on 21.7.1985 at the Botanical Gardens (NAUDE 1985). During the years 1993-1998, a dozen or so pairs were recorded in 51 km² of Bloemfontein city (KOPIJ 2001).

Black-faced Waxbill *Estrilda erythronotos*

Rare breeding resident in *Acacia karroo* vegetation. During the years 1983-86 only one record was made at Soetdoring NR (EARLE & GROBLER 1987). Density: 0.6 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a)

Common Waxbill *Estrilda astrild*

Common breeding resident in wetlands. Density: 2.6 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a). It comprised 0.9% of birds captured for ringing at Bishop Glen during the years 1993-2005 (N= 10944) (DE SWARDT et al. 2005).

Violet-eared Waxbill *Granatina granatina* (Fig. 23)

Rare breeding resident on water courses with *Acacia karroo* vegetation. During the years 1983-86, 5 records were made on the Modder River near Glen (EARLE & GROBLER 1987). During the years 1993-2000, two breeding sites were recorded.

Blue Waxbill *Uraeginthus angolensis*

Rare breeding resident in *Acacia karroo* vegetation.

Red-billed Firefinch *Lagonosticta senegala*

Possibly, a very rare breeding resident. During the years 1983-86, 5 records were made in the northern part of the district (EARLE & GROBLER 1987); a pair was recorded on 2.5.1995 in the Botanical Gardens (NUTTALL 1995).

VIDUIDAE

Pin-tailed Whydah *Vidua macroura*

Rare breeding resident.

Long-tailed Paradise Whydah *Vidua paradisaea*

Vagrant. During the years 1983-86, 2 records were made in the 2826CC atlas grid (EARLE & GROBLER 1987).

Shaft-tailed Whydah *Vidua regia*

Vagrant. During the years 1983-86, 5 records were made in the 2826CC atlas grid (EARLE & GROBLER 1987); on 12.2.1994 recorded also at Glen (NUTTALL 1994b).

Village Indigobird *Vidua chalybeata*

Rare breeding resident in *Acacia karroo* vegetation. During the years 1983-86, it was probably a very rare breeding resident. It was recorded at

Glen (HERHOLDT & EARLE 1987), in the 2826CC atlas grid (EARLE & GROBLER 1987); and a male was observed on 25.11.1995 in Soetdoring NR (NUTTALL 1996).

PASSERIDAE

House Sparrow *Passer domesticus*

Common breeding resident in urban habitat, mainly in the city center. It is an alien and expanding species. The first record in the Bloemfontein area was made in July, 1959, in the city (Markus 1960). Density: 225 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015); 19 pairs/55 ha, UFS campus suburbs (KOPIJ 1994); 1.7%, dominance, Bainsvlei intensive farmlands (KOPIJ 1998a).

Great Sparrow *Passer motitensis*

Vagrant. During the years 1983-86, 4 records were made in the 2826CC and 2926AA atlas grids (EARLE & GROBLER 1987).

Cape Sparrow *Passer melanurus*

Very common breeding resident all over the district, in suburbs, farmlands, and *Acacia karroo* vegetation. Density: 87.5 pairs/10 ha, Zoological Gardens (8 ha) (KOPIJ 1999d); 22.2 pairs/10 ha, King's Park (9 ha) (KOPIJ 1999e); 1467 pairs/10km², the most numerous bird species, Bloemfontein city (51 km²) (KOPIJ 2015); 90 pairs/55 ha, UFS campus suburbs (KOPIJ 1994); 42.3 pairs/10 km, *Olea-Buddleia* vegetation (12 km transect) (KOPIJ 2013); 1.7 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 14.0 pairs/10 km, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a); 138.2 pairs/10 km, as dominant and as the second most common species, Bloem Spruit in peri-urban environment (11 km transect) (KOPIJ 1997b); 28.3%, dominance, Bainsvlei intensive farmlands (KOPIJ 1998a). In Bloemfontein, nests were mainly located in *Celtis africana*, *Ulmus parvifolia* and *Acacia karroo* (KOPIJ 1999b).

Southern Grey-headed Sparrow *Passer diffusus*

Rare breeding resident in suburbs, *Acacia karroo* vegetation, and farmsteads. Density: 0.6 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a).

Yellow-throated Sparrow *Petronia supercilii*

Vagrant. During the years 1983-86, two records were made in the 2926AA atlas grid (EARLE & GROBLER 1987).

MOTACILLIDAE

African Pied Wagtail *Motacilla aguimp*

Vagrant. During the years 1983-86, three records were made in north-eastern part of the district (EARLE & GROBLER 1987).

Cape Wagtail *Motacilla capensis*

Common breeding resident in water courses, urban habitats, and at dams. Density: 3.5 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015); 4.6 pairs/10 km, Modder River (63 km transect) (KOPIJ 2000a); 1.4 pairs/10 km, Kaal Spruit (7 km transect) (KOPIJ 2000b); 10.9 pairs/10 km, Bloem Spruit in peri-urban environment (KOPIJ 1997c).

Yellow Wagtail *Motacilla flava*

Vagrant. 4 exx., 21.2.1991, Krugersdrift Dam (COLAHAN 1992a); 1-2 ad., 7.2.1999 and 21.2.1999, Soetdoring NR (NUTTALL 1999a).

Cape Longclaw *Macronyx capensis*

Common breeding resident in grassland, especially wetlands. Density: 3 pairs/230 ha, peri-urban grassland on UFS campus (KOPIJ & ESTERHUIZEN 1994a).

African Rock Pipit *Anthus crenatus*

Possibly, a very rare breeding resident. Botanical Gardens, Bishop Glen (N. GROBLER 1986: Mirafr, 3(2): 28); 1 pair, Kloofeinde, 30.11.1995 (DE SWARDT 1998).

African Pipit *Anthus cinnamomeus*

Very common breeding resident in grassland. Density: 22.9 pairs/10 km, *Cymbopogon-Themeda* grassland in the Kaal Spruit valley (7 km transect) (KOPIJ 2000b); 1.6 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015).

Buffy Pipit *Anthus vaalensis*

Rare breeding resident in dolorite koppies and short grassland. During the years 1983-86, 2 records were made in the 2826CC atlas grid (EARLE & GROBLER 1987); 1 ad., 16.5.1998, Soetdoring NR (DE SWARDT 1998).

Long-billed Pipit *Anthus similis*

Rare breeding resident in dry *Acacia karroo* vegetation.

FRINGILLIDAE

Cape Canary *Serinus canicollis*

Rare breeding resident in the Bloemfontein suburbs.

Black-headed Canary *Serinus alario*

Vagrant. During the years 1983-86, 2 records were made (EARLE & GROBLER 1987).

Yellow-fronted Canary *Crithagra mozambica*
Vagrant.

Black-throated Canary *Crithagra atrogularis*

Fairly common breeding resident. Density: 5.5 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015); 3.8 pairs/10 km, *Olea-Buddleia* vegetation (12 km transect) (KOPIJ 2013); 0.8 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a).

Yellow Canary *Crithagra flaviventris*

Common breeding resident in *Acacia karroo* vegetation, and in the Bloemfontein suburbs. Mainly in the northern and western parts of the district. Density: 1.9 pairs/10 km, *Olea-Buddleia* vegetation (12 km transect) (KOPIJ 2013); 2.9 pairs/10km², Bloemfontein city (51 km²) (KOPIJ 2015); 11.4 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 5.2 pairs/10 km, *Acacia karroo* on the Rhenoster River (15 km transect) (KOPIJ 2000a).

Brimstone Canary *Serinus sulphuratus*

Vagrant. During the years 1983-86, 4 records were made in the 2826CC and 2926AA atlas grids (EARLE & GROBLER 1987).

White-throated Canary *Crithagra albogularis*

Rare breeding nomad in *Olea-Buddleia* vegetation. Recorded as breeding at the Franklin Game Reserve (KOPIJ & DE SWARDT 1998); 1 ex. in May 1997 in the Botanical Gardens in Bloemfontein (NUTTALL 1998b).

Streaky-headed Canary *Serinus gularis*

Rare breeding resident in clumps of coniferous trees.

Lark-like Bunting *Emberiza impetuanii*

Rare breeding resident in short grasses.

Cinnamon-breasted Bunting *Emberiza tahapisi*

Fairly common breeding resident in *Olea-Buddleia* vegetation. Density: 5-10 pairs were recorded in 51 km² of Bloemfontein city (KOPIJ 2001); 2.3 pairs/10 km, *Acacia karroo* on the Modder River (63 km transect) (KOPIJ 2000a); 3.1 pairs/10 km, *Olea-Buddleia* hills near Tafelkop and Glen (KOPIJ 2000b).

Cape Bunting *Emberiza capensis*

Fairly common breeding resident in *Olea-Buddleia* vegetation. Density: 5.4 pairs/10 km *Olea-Buddleia* hills near Tafelkop and Glen (KOPIJ 2000b).

Golden-breasted Bunting *Emberiza flaviventris*

Probably, a very rare breeding resident in hill-side bushes.

V. DISCUSSION

A total of 324 bird species were recorded in the Bloemfontein area during the years 1977-2000 (Table 1), which comprise about 32% of bird species ever recorded in southern Africa (CHITTENDEN et al. 2016); 180 (55.6%) of them were represented by non-passeres belonging to 46 families, while the other 144 (44.4%) by passers belonging to 21 families (Table 1). The Anatidae, Accipitridae, Ardeidae, Hirundinidae, Sylviidae, Cisticolidae, Aluadidae, Muscicapidae, Ploceidae and Fringillidae were the most speciose families (with more than 10 species each). Apart from Passeriformes, the other most speciose orders included Charadriiformes (29 species), Accipiteriformes (23), and Ciconiiformes (23).

Breeding birds comprised 195 (60.2%) species, while non-breeding birds comprised 129 species (39.8%). Among the breeding species, most (55.9%) were residents throughout the year, 3.1% were intra-African migrants and 1.2% were nomads (Table 1). It is important to add that some species classified as very rare or rare were recorded as breeding irregularly, only in some years. Some could have passed undetected during the study period.

Non-breeding birds were represented by Palearctic migrants (35 species, 10.8%) classified as vagrants, irregular and regular visitors; and African non-breeding species (94; 29.0%), mainly from the group of vagrants (Table 1).

Among the breeding species, most were rare or very rare (100 species, 56.4%). Only 24 (12.3%) of them were very common, nine of which were non-passers and 15 passerines (Table 2). The group included the: Helmeted Guineafowl, Little Swift, Speckled Mousebird, Red-faced Mousebird, Rock Dove, Speckled Pigeon, Laughing Dove, Cape Turle-Dove, Crowned Lapwing, Common Fiscal, South African Cliff Swallow, Red-eyed Bulbul, African Reed Warbler, Cape White-eye, Neddicky, Colud Cisticola, Black-chested Prinia, African Pipit, Clapper Lark, Cape Robin, Masked Weaver, Common Quelea, South African Red Bishop and Cape Sparrow.

During the years 1977-2000, human activities, especially agriculture, appear to have had a huge impact on the avifauna of Bloemfontein. The top predators were especially affected. Diurnal birds of prey have markedly decreased their numbers over the last few decades. Only single, or at most a few, pairs of each eagle species (African Fish, Black, Tawny and Martial) can still be found in the area of Bloemfontein. Vultures have virtually disappeared altogether as resident birds, and other larger raptors (e.g. Secretarybird, Southern Pale Chanting Goshawk) are rare. The only raptor

which could benefit from the expansion of agriculture is the Black-shouldered Kite. Its main prey, rodents (KOPIJ et al. 2004), are abundant on farmsteads where the Kites usually establish their nests. Most likely, the Black-shouldered Kite has markedly increased its number during the last 50 years. Eucalyptus, so often planted on the farmlands in the Bloemfontein area, may also have attracted some goshawk species, such as the Black Goshawk, Red-breasted Sparrowhawk and Gabar Goshawk. This relatively low population density of resident raptors could have been very conducive for Palearctic migrants, viz. the Lesser Kestrel, and Amur Falcon, which overwinter in this area in huge numbers.

In order to protect the remaining raptors, the old tree stands on and around farmsteads should be conserved. It will be especially important to conserve the large eucalyptus trees which serve as roosting sites for the Palearctic migrants. For the more efficient protection of eagles, the regional authorities should create exclusion zones 0.5-1 km around their known nesting sites. The sites should be regularly monitored by nature conservation officers.

More conservation efforts should be also made to protect heronries. These are usually multispecies breeding colonies established around dams or larger water reservoirs. They are often occupied annually for many years. Some of them are disturbed by people, and some have even been destroyed. Such sites, especially those with larger colonies, should be protected as nature reserves.

Raptors are a group requiring special protection in the Bloemfontein area. Conversely, there are also alien invasive bird species which require eradication from this area. Four have established themselves so far; the Feral Pigeon, House Sparrow, European Starling and Indian Myna. The two former species are strictly associated with human settlements, especially in the greater city of Bloemfontein. Their negative effect on the local avifauna is therefore limited. However, the European Starling and Indian Myna dispersed into countryside, and may become competitors of the indigenous species. They are currently, relatively uncommon, but may soon spread, causing a sharp population decline and even local extinction in other species.

It is also recommended to establish some sort of protection in the river valleys covered with *Acacia karroo* vegetation and some of the *Olea-Buddleia* fields. It has been shown that they usually harbour the highest diversity of bird species, and that many of these species reach their highest population densities in these areas.

Last, but not least, the local university, nature history museum, bird clubs and other pro-ecological societies in and around Bloemfontein

should increase their effort to educate the public about the importance of the protection of native birds, their habitats and nature in general. It is especially important that such environmental education reaches the municipalities, schools and the farmers who control most of the land in question. These organizations should also be more involved in the monitoring of more important sites (e.g. Bishop Glen, larger dams, water reservoirs and river valleys); breeding colonies of ciconiiforms, the roosting sites of Palearctic raptors and the Barn Swallow, and species important for conservation (e.g. key and umbrella species, but also invasive ones), such as eagles, owls, korhaans, hornbills, wood-hoopoes, coraciiforms, cuckoos, Secretarybird, Hamerkop, Sacred Ibis, Baillon's Crake and Buff-spotted Flufftail.

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