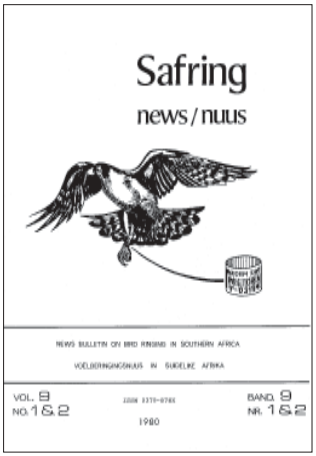
Editorial

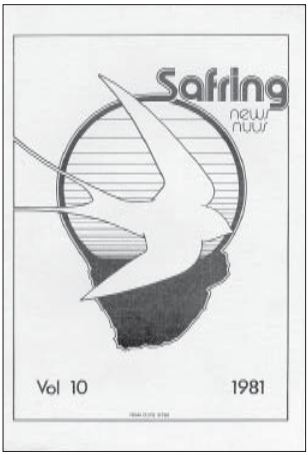
Safring News has been upgraded to *Afring News*! The idea was conceived last year while I was preparing a visit to some ringers in Kenya and the SAFRING steering committee approved the idea in June 2001. *Safring News* was first published 30 years ago in 1972, with one or two issues every year (see below). The cover changed in 1981, the year after Terry Oatley started working at SAFRING. *Safring News* has been the medium for SAFRING's ringing and recovery reports (previously published in Ostrich) as well as wide ranging articles about trapping birds, ageing and sexing, ringing expeditions, reports on studies using ringing, etc. written by ringers.

SAFRING has for many years provided ringing services to neighbouring African countries, and with the name change to *Afring News* greater links are established with countries further than neighbours. There is no other ringing journal in Africa – East African ringers publish their ringing reports in journals like *Scopus*. This issue has two articles that reflect the wider coverage of *Afring News*: although one is about ringing in Lebanon, it covers migrants to Africa and is written by Colin Jackson, an active ringer in Kenya; the other is about ringing forest birds in Tanzania. Other articles cover ringing in Zimbabwe and Botswana, lovebirds in Zambia, flamingoes in Namibia, and various subjects from South Africa.

In May I was invited to visit Israel for a conference for African delegates on bird migration, flight safety (bird strikes) and education (using birds in education). Yossi Leshem organised sponsorship for the conference. After two days of lectures the delegates were treated to a week of excursions to see the various bird projects in Israel in action! It was great to see migrating White Storks, Honey Buzzards and other raptors. I was also able to handle passerine migrants at various ringing stations.

In August a group from the ADU attended the European Ornithologists Union and Wader Study Group meetings in the Netherlands. Both conferences were successful and a wide variety of ornithological research was presented. In addition, I attended the Euring General Assembly meeting where I was able to meet many European ringing coordinators.





Examples of the covers of *Safring News* from the periods 1972–1980 and 1981–2000.

Blackcheeked Lovebirds by Lauren Gilson

Papers

Nine years in the Eastern Highlands of Zimbabwe

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Introduction

In the Eastern Highlands of Zimbabwe many birds survived the 'worst drought in living memory' (1991/2–1996): some in what was apparently a haven where they were recaptured or resighted regularly and others elsewhere, as they reappeared at trapping sites after the drought. Birds which were adult at the start of the drought survived better than those hatched in 1991 or during the drought, perhaps due to adults having a better knowledge of places suitable for sitting out the annual 'drought' (May to October), which places should also be a haven during a summer drought (Hanmer 1997).

I wondered what capture/recapture figures would show after another two years if El Nino did not mess things up, but La Nina provided more rain than was really wanted during 1997/8 and 1998/9.

Sites

Mitsasa (Mit) 19°03'S, 32°39'E; altitude 1200 m: Little trapping between October 1994 and April 1997 but colour-ringed birds noted. Fairly regular weekly trapping thereafter.

La Rochelle Botanical Gardens (LaR) 18°54'S, 32°42'E; altitude c. 1200 m: Trapping once a month throughout.

Mountain Home (MtH) 18°50'S, 32°41'E; altitude 1460 m: Trapping once a month since July 1992.

Vumba Botanical Gardens (VBG) 19°07'S, 32°41'E; altitude 1550 m: Trapping once a month throughout.

For a description of the sites see Hanmer (1997).

Methods

Mist netting between July 1990 and June 1999, using 8–12 nets (11–12 in 1994–97), set in roughly the same place each month for nine hours. Numbered rings were placed on all birds and some were colour-ringed.

Rainfall and temperature

The four sites differ in both temperature and rainfall, due to altitude and geographical position relative to the border mountains and the rain bearing winds from the south-east. Mitsasa (mean annual temperature 21.7°C over nine years) and La Rochelle are fairly hot; the other sites are cooler. Mitsasa is in a rain shadow; La Rochelle receives more rain and the montane sites considerably more, but proportionately the annual rainfall at the four sites is similar. Fig. 1 shows the rainfall received at Mitsasa (where the drought had the greatest impact), superimposed on recapture figures for all sites combined and shows general congruence.

Results

Table 1 gives the number of birds ringed each year from July 1990 to June 1999, with the number (and percentage) recaught for the last time in a later year, at all sites combined. For 1991/2 the 15 birds ringed at Hillcrest College are excluded as no further trapping was done there and the figure for birds ringed in 1995/6 was given incorrectly by Hanmer (1997).

Table 1. Number ringed and number and percentage recaught for the last time in each succeeding year (July to June), at four sites (combined) in the Eastern Highlands, between July 1990 and June 1999. Underlined figures relate to 1996/7 after rain started in January 1996.

Year	Number	Recaught after (years)								Total
ringed	ringed	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	>1 yr (%)
90/1	1049	76 (7.2)	28 (2.7)	21 (2.0)	7 (0.7)	11 (1.0)	6 (0.6)	4 (0.4)	6 (0.6)	159 (15.2)
91/2	1349	35 (2.6)	26 (1.9)	17 (1.3)	6 (0.4)	7 (0.5)	2 (0.1)	5 (0.4)		98 (7.3)
92/3	1171	43 (3.7)	26 (2.2)	24 (2.0)	18 (1.5)	15 (1.3)	8 (0.7)			134 (11.4)
93/4	1019	31 (3.0)	19 (1.9)	10 (1.0)	11 (1.1)	8 (0.8)				79 (7.8)
94/5	885	20 (2.3)	11 (1.2)	9 (1.0)	12 (1.4)					52 (5.9)
95/6	781	29 (3.7)	11 (1.4)	5 (0.6)						45 (5.8)
96/7	1028	64 (6.2)	20 (1.9)							84 (8.2)
97/8	1024	27 (2.6)								27 (2.6)

The number ringed increased in 1991/2 (the start of the drought), despite the same trapping effort as in the previous year. Thereafter numbers declined, even though trapping started at Mountain Home in 1992 and more nets were used from 1994. The number ringed did not increase immediately after the drought broke in January 1996 but the following year showed a return to 1990/1 levels and this was maintained in 1997/89 although numbers at Mountain Home had begun to decrease and fewer nets were used from 1998. In 1998/9 the number ringed at Mountain Home and Vumba Gardens decreased, but Mitsasa and La Rochelle were back to pre-drought levels.

Recapture figures for birds ringed in 1990/1 probably were almost normal in the first year, but thereafter declined, only becoming fairly normal again after the rains returned; that six (0.6%) were recaught after eight years is reasonable. Recapture percentages for 1996/7 are underlined. To the left, generally low percentage recaptures presumably were caused by drought, with some variations due to increased rainfall in 1992/3 and 1993/4. The heavy rain during January–March 1996 did not increase recapture figures much; it is only from 1996/7 or 1997/8 that there is any real improvement. However, by 1998/9 recapture percentage of birds ringed in 1995/6 and later had slumped. In the first year after ringing, under reasonable conditions to begin with, followed by an exceptionally dry summer, at least 7.2% of birds ringed in 1990/1 were recaught. The actual number recaught after a year was far more than 76, since birds recaught in subsequent years are not included in that figure, whereas for 1997/8, 27 (2.6%) is the total number which was recaught in 1998/9.

Fig. 1 was drawn up using the total number of birds ringed each year which have been recaught at least one year later (from Total in Table 1), as a percentage of the number ringed each year. The annual rainfall for Mitsasa is superimposed. There seems to be a relationship between rainfall and percentage recapture, with few of the birds ringed in 1991/2 (which was very dry) being seen again and an increased recapture of birds ringed in 1992/3 (which was wetter). However, a similar rainfall in 1993/4 did not produce similar results and the heavy rain in January–March 1996 also did not increase the percentage recaught. It is only among birds ringed in 1996/7 that percentage recapture over the following two wet years shows an increase, but this is not maintained among birds ringed the following year, despite good rains. This suggests that while rainfall had some bearing on recapture figures, it is not the sole cause of the recapture pattern found.

The four sites differ geographically and

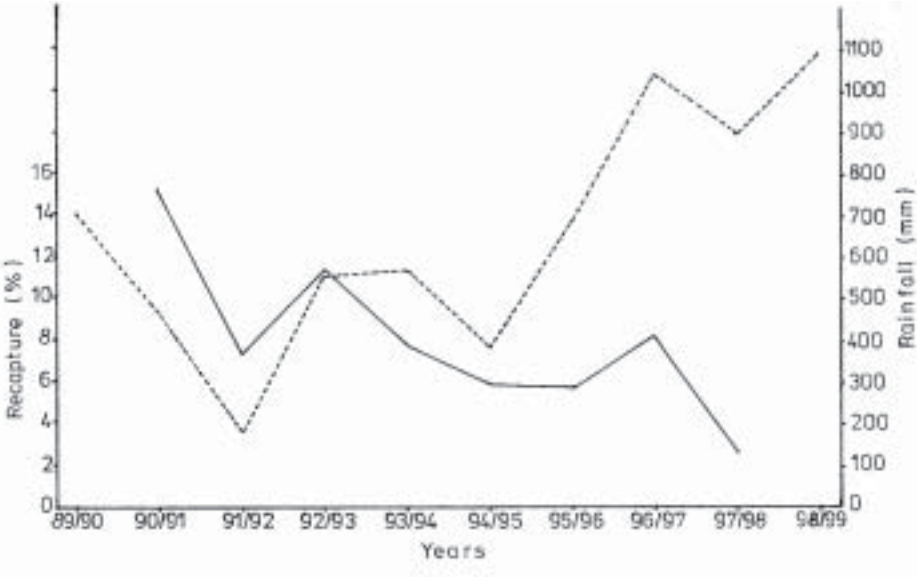

Fig. 1. The percentage of birds ringed in each year (from July to June) at all sites combined, which were recaptured at least one year later = solid line. Annual rainfall at Mitsasa = dotted line.

climatically, Mitsasa and La Rochelle being mid altitude and relatively hot and dry. At Mitsasa bird baths are kept full, but the garden is not watered, whereas at La Rochelle bird baths are usually dry, but the garden is watered. The dam was dry in 1994–7, but much water leaked from borehole pipes. Mountain Home and Vumba Gardens are high, cool and relatively wet and at both there is permanent water. One would therefore expect to find a difference in 'survival' and this is shown in Table 2.

Percentage recapture (adult and immature-ringed combined) at each year level is similar for Mountain Home and Vumba Gardens and fairly similar for La Rochelle and Mitsasa, although Mitsasa figures suffered from little trapping between October 1994 and April 1997, while high first and second year figures are due to seed-eaters being resident during the drought. At La Rochelle only first and second year figures are higher than at the two montane sites, but overall (Total, Table 2), the montane sites have a lower percentage recapture than found at the other two sites.

Table 2 also shows the difference in percentage recapture of birds ringed when adult and those ringed when immature; site differences are considerable.

Table 3 shows the number of adults and immatures ringed each year at each site and the percentage recaught after at least one year. In general, before and during the drought, fewer immatures than adults were ringed each year, except at La Rochelle in 1992/3 and 1993/4 (wettish years) and at Mountain Home in 1993/4 and 1994/5, but there was an increase in the number of immatures ringed in 1996/7 and 1997/8, probably as a result of increased breeding after the drought. Table 3 was used to construct Fig. 2, where recapture percentages are graphed against year ringed. The drought (roughly early summer 1991 to December 1995) is shown between dotted lines although the rainfall in the summer of 1990/1 was also low.

Table 2. Number of birds ringed at each site (those ringed when adult and those ringed when immature, combined and separate) between July 1990 and June 1998 and number and percentage recaught in each succeeding year. Immature percentage given below each site.

Site	Age	Number	Recaught after (years)														Total	
		ringed	1	(%)	2	(%)	3	(%)	4	(%)	5	(%)	6	(%)	7	(%)	8	(%)	>1 year	(%)
Mit	A+I	1403	65	(4.6)	29	(2.1)	6	(0.4)	10	(0.7)	7	(0.5)	1	(0.1)	3	(0.2)	2	(0.1)	123	(8.8)
	A	820	49	(6.0)	25	(3.0)	6	(0.7)	9	(1.1)	7	(0.9)	0		2	(0.2)	1	(0.1)	99	(12.1)
	I	583	16	(2.7)	4	(0.7)	0		1	(0.2)	0		1	(0.2)	1	(0.2)	1	(0.2)	24	(4.1)
	I	41.6%																	19.5%	
LaR	A+I	3077	130	(4.2)	56	(1.8)	30	(1.0)	18	(0.6)	13	(0.4)	4	(0.1)	3	(0.1)	3	(0.1)	257	(8.4)
	A	1580	78	(4.9)	40	(2.5)	25	(1.6)	14	(0.9)	11	(0.7)	4	(0.3)	2	(0.1)	2	(0.1)	176	(11.1)
	I	1497	52	(3.5)	16	(1.1)	5	(0.3)	4	(0.3)	2	(0.1)	0		1	(0.1)	1	(0.1)	81	(5.4)
	I	48.7%																	31.5%	
MtH	A+I	1898	64	(3.4)	32	(1.7)	21	(1.1)	13	(0.7)	10	(0.5)	5	(0.3)					145	(7.6)
	A	998	37	(3.7)	20	(2.0)	12	(1.3)	10	(1.0)	7	(0.7)	4	(0.4)					90	(9.0)
	I	900	27	(3.0)	12	(1.3)	9	(1.0)	3	(0.3)	3	(0.3)	1	(0.1)					55	(6.1)
	I	47.4%																	37.9%	
VBG	A+I	1928	60	(3.1)	28	(1.5)	26	(1.3)	13	(0.7)	10	(0.5)	6	(0.3)	3	(0.2)	1	(0.2)	147	(7.6)
	A	1082	50	(4.6)	21	(1.9)	19	(1.9)	13	(1.2)	9	(0.8)	5	(0.5)	3	(0.3)	1	(0.1)	121	(11.2)
	I	846	10	(1.2)	7	(0.8)	7	(0.8)	0		1	(0.1)	1	(0.1)	0		0		26	(3.1)
	I	43.9%																	17.7%	
Total	A+I	8306	319	(3.8)	145	(1.7)	83	(1.0)	54	(0.7)	40	(0.5)	16	(0.2)	9	(0.1)	6	(0.1)	672	(8.1)
	A	4480	214	(4.8)	106	(2.4)	62	(1.4)	46	(1.0)	34	(0.8)	13	(0.3)	7	(0.2)	4	(0.1)	486	(10.8)
	I	3826	105	(2.7)	39	(1.0)	21	(0.5)	8	(0.2)	6	(0.2)	3	(0.1)	2	(0.1)	2	(0.1)	186	(4.9)
	I	46.1%																	27.7%	

Table 3. Number of birds ringed each year between July 1990 and June 1998 at four sites and number and percentage recaught at least one year later. Those ringed when adult and those ringed when immature are separated. Data used to construct Fig. 2.

Year	Age	Mitsasa			La Rochelle			Mountain Home			Vumba		
ringed		n	Retrap >1 year	(%)	n	Retrap >1 year	(%)	n	Retrap >1 year	(%)	n	Retrap >1 year	(%)
90/1	A	177	28	(15.8)	351	67	(19.1)				158	34	(21.5)
	I	103	5	(4.9)	170	18	(10.6)				90	3	(3.3)
91/2	A	299	20	(6.7)	357	37	(10.4)				145	22	(15.2)
	I	171	2	(1.2)	254	13	(5.1)				123	6	(4.9)
92/3	A	65	14	(21.5)	192	23	(12.0)	259	46	(17.8)	140	14	(10.0)
	I	67	2	(3.0)	208	10	(4.8)	143	21	(14.7)	97	3	(3.1)
93/4	A	126	9	(7.1)	74	5	(6.8)	147	16	(10.9)	138	13	(9.4)
	I	93	5	(5.4)	149	9	(6.0)	169	16	(9.5)	123	7	(5.7)
94/5	A	49	5	(10.2)	102	7	(6.9)	186	12	(6.5)	68	11	(16.2)
	I	74	1	(1.4)	105	8	(7.6)	224	6	(2.7)	77	1	(1.3)
95/6	A	2	0		161	17	(10.6)	165	8	(4.8)	128	10	(7.8)
	I	0			133	4	(3.0)	102	5	(4.9)	90	1	(1.1)
96/7	A	43	19	(44.2)	197	17	(8.6)	138	5	(3.6)	154	13	(8.4)
	I	26	6	(23.1)	241	15	(6.2)	144	5	(4.4)	115	3	(2.6)
97/8	A	59	4	(6.8)	146	3	(2.1)	103	3	(2.9)	151	4	(2.6)
	I	49	3	(6.1)	237	4	(1.7)	148	2	(1.4)	131	2	(1.5)

Recaptures

Mitsasa: Few birds (of many species) ringed in 1991/2 were seen again, whereas most of those ringed between 1992/3 and 1996/7 were resident small seed-eaters, doves, weavers and canaries, of which a high proportion were recaught, mainly over one to three years. Of non-seed-eaters ringed in 1990/1 and 1992/3, most were only recaught after 1996. Few birds (of many genera) ringed in 1997/8 have been recaught. Overall (Table 2), although adult recapture is highest, due to the presence of resident seed-eaters, percentage recapture of immature-ringed birds is almost the lowest.

La Rochelle: The range of species ringed (mainly sunbirds, but many other genera) remained much the same until 1994/5, by which time most seed-eaters had disappeared, only being seen again in reasonable numbers in 1997/8; few of these had been ringed previously. Most of the birds ringed before and during the drought and recaught, were sunbirds and many were seen regularly, but some ringed in 1990/1 and 1992/3 (sunbirds and others) were not recaught until 1996/7 or later. Of those ringed in 1997/8 (many genera) few have been seen again. The overall recapture rate is fairly high. Both adult and immature rates are relatively high.

Vumba Gardens: Many sunbirds and other genera were ringed throughout the period, but the number of seed-eaters, especially canaries, decreased during the latter part of the drought, and sunbirds, especially Bronze, reduced in number from 1997. Some sunbirds were recaught regularly during the drought, as were a few bulbuls, robins, thrushes and canaries, especially of those ringed in 1994/5, but many birds ringed in 1990/1 and 1991/2 were only recaught after the drought. Few of those ringed in 1997/8 (including fewer sunbirds) have yet been recaught. Overall percentage recapture is low; the adult figure is fairly high, but immature recapture is the lowest for any site.

Mountain Home: Trapping started in July 1992. Initially many sunbirds and other gen-

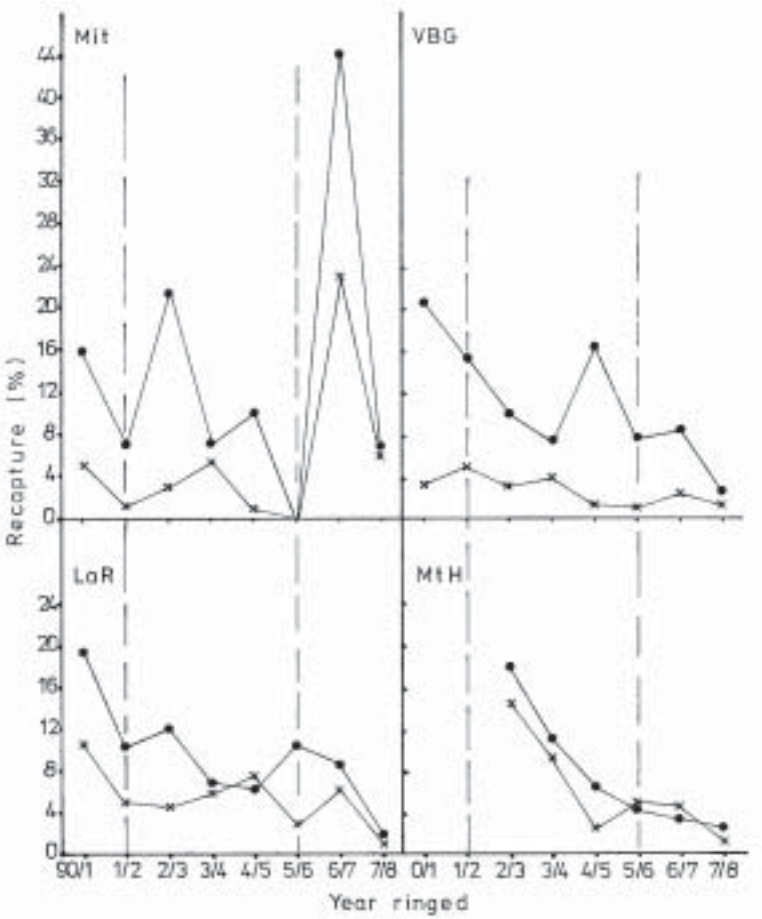

Fig. 2. The percentage of birds ringed in each year (from July to June) at each of four sites, which were recaptured at least one year later. Those ringed when adult = M, those ringed when immature = X. Vertical dotted lines roughly indicate the period of the drought.

era were ringed but from 1994/5 the number of warblers and seed-eaters decreased and once the *Protea repens* died (by 1995/6) fewer sunbirds were caught. During the drought most recaptured birds were sunbirds, but from 1996/7 a few of other genera were recaught, not having been seen since 1992/3 or 1993/4. Very few of the many genera ringed in 1997/8 have been recaught. Overall the recapture rate is low, but the rate for immature-ringed birds is the highest.

Longevity

Using the apparent age of each bird at ringing, the months of first and last capture and the breeding season, birds were aged to the nearest six months. For birds ringed when immature this is roughly correct, but for birds ringed when adult it is the minimum age and is given as 'more than'.

Table 4 lists the birds known to have reached at least four years old; 26% were

Table 4. Birds known to have reached four or more years old. Those marked as more than the age were ringed when adult. D/O = mainly in dense vegetation, but comes into the open. O = normally found in the open.

Species	Habitat	Age (years)												Species
		4	>4	5	>5	6	>6	7	>7	8	>8	9	>9	12	total
African Goshawk	D/O									M					1
Laughing Dove	O				M		F								2
Palm Swift	O						F								1
Speckled Mousebird	O	2	1												3
African Hoopoe	O		F												1
Blackcollared Barbet	O				F										1
Cardinal Woodpecker	O		F						F						2
Blackeyed Bulbul	O	2M	M, 2F		M, F	M	M, 2F		2F						13
Stripecheeked Bulbul	D/O						F		F				M		3
Kurrichane Thrush	O		3M, F	M, F	M		M		M						9
Olive Thrush	D/O					M			M, F						3
Heuglin's Robin	D/O	M, F	M												3
Cape Robin	D/O		M		F										2
Grassbird	O						M								1
Barthroated Apalis	D/O		2F		2M		2F				F				7
Singing Cisticola	O		M												1
Pallid Flycatcher	O						M								1
Black Flycatcher	O						M								1
Chinspot Batis	O						M								1
Paradise Flycatcher	O		F										M		2
Longtailed Wagtail	O		F								M				2
Southern Puffback	O		F												1
Olive Bush Shrike	D/O								F						1
Redwinged Starling	O		F												1
Malachite Sunbird	O								F						1

(Table 4. continued.)

Species	Habitat	Age (years)												Species
		4	>4	5	>5	6	>6	7	>7	8	>8	9	>9	12	total
Bronze Sunbird	O		2M	M		M	F	F	3M, 2F					M	12
Miombo Sunbird	O		F				M			M	M		M		5
Yellowbellied Sunbird	O	M, 2F	5M, F	M	2M, 3F		7M, 3F		F						26
Olive Sunbird	D/O	4M, 2F	9M, F	4M, 3F	2M,2F	3M	2M	4M	2M		M		M		40
Collared Sunbird	D/O	M	M		2M		F								5
Black Sunbird	O	M	2M	M			M	M							6
Yellow White-eye	D/O		3M, 2F, 3	M, F	4F		3M		2M						19
Yellowthroated Sparrow	O												M		1
Spectacled Weaver	O		M												1
Spottedbacked Weaver	O	M	2M												3
East African Swee	O				F										1
Redthroated Twinspot	D/O		M												1
Bluebilled Firefinch	D/O	F	M	M											3
Blue Waxbill	O	F			3M	F									5
Cape Canary	O	M	3M, F		2F	M									8
Yelloweyed Canary	O				M,F										2
Bully Canary	O	M	F		M		F								4
Streakyheaded Canary	O		M, F		M										3
Number immature/adult		22/61		15/33		8/33		7/18		2/4		0/5		1/0	55/154
Percentage immature		26.5%		31.3%		19.5%		28.0%		50.0%		0%		100%	26.3%
Number male/female		51/26		27/21		27/14		14/11		5/1		5/0		1/0	130/73
Percentage male		66.2%		56.3%		65.9%		56.0%		83.3%		100%		100%	64.0%
Number sex unknown		6													6
Total															**209**

ringed when immature and 64% are male. There are 88 of 12 species (42%) which prefer dense habitat and 121 of 31 species (58%) which live in the open. Most of the older birds are insectivorous or omnivorous; only ten (4.8%) of four species are purely seed-eaters.

Table 5 lists 37 birds of seven or more years old in some detail; 27% were immature when ringed and 67.6% are male, while 17 of seven species (46%) favour a dense habitat and none is a seed-eater.

Hanmer (1997) listed 19 of the birds in Table 5 as being five or more years old at June 1997, of which seven have not been seen since 1996, although they were present during the drought. Twelve were recaught after June 1996, of which three were present throughout the drought and nine were seen at the start of the drought, but not again until 1996/7 and of these nine, four have not been seen since June 1997.

In the present list there are 18 'new' birds aged over seven, of which 14 had not been seen since the start of the drought, but reappeared after good rain, one bulbul in 1996 and the rest in 1997–99. Only four of the 'new' birds were caught during the drought; they were not caught in 1996/7 but probably were present and are still present.

Table 6 shows the year in which each of the birds listed in Table 4 was last seen. Of the 147 reported by Hanmer (1997) as having reached four or more years old, only 29 were seen after June 1997. Of 91 more birds of 4–9 years old last seen between July 1997 and June 1999, only 18 were seen during the drought. Some of the birds last seen before 1996 may have died, but there is no climatic reason for the 62 birds last seen between January 1996 and June 1997 to have died. Of the 91 last seen after July1997, a high proportion probably are still alive and may be caught again (some have been), so totals for those six-monthly periods merely relate to recapture figures, but many of those birds had not been seen for years.

Movement

From local trapping and recovery data there is some evidence of movement. An adult female Miombo Sunbird, caught at La Rochelle in consecutive winters, was recovered c. 25 km away early in the breeding season (October 1991). A Malachite Sunbird, ringed on the Vumba during winter, was recaught at Mountain Home (October 1991), presumably on the way to a breeding area and some Bronze Sunbirds, ringed at Seldomseen (on the Vumba), were recaught at Vumba Gardens a few kilometers away in 1990–92. An Olive Sunbird, ringed at La Rochelle (April 1998) was recaught at Mountain Home the following month, a straight line distance of c. 8 km, with two high, pine-clad ridges in between (and I thought this species was sedentary). None of these movements was drought-related.

A young Kurrichane Thrush, ringed at La Rochelle before the drought, was killed on the Pungwe River in Mozambique five years later, as the drought ended; its movements in the interim are unknown. An adult Yelloweyed Canary, ringed at Mitsasa before the drought, was killed near the dam 1,5 km away in March 1992 and an adult Southern Puffback, also ringed at Mitsasa before the drought, was killed partway up the Vumba Mountains in July 1992, as was a young Brubru Shrike, although this last may have been an instance of immature dispersal and not drought-related. However, of those which probably were, two had moved down towards permanent water and one had moved up to a cooler, moister altitude.

Discussion

Movement

The increase in the number ringed in 1991/2 (Table 1) when trapping effort remained constant, suggests that birds were moving into trapping areas at the start of the drought. The decline in number caught until 1996/7 suggests a reduction in the number of birds at sites during the drought, due to death or emigration, with an increase once the rains returned, due to immigration or breeding success. That the latter was a factor is shown by the increased number of immatures ringed in 1996/7 and 1997/8 (Table 3).

Table 5. Birds known to have reached seven or more years old by June 1999, with site of capture and age when ringed. Hanmer (1997) listed 19 as having reached the age of five or more and there are 18 new birds. The years in which birds were seen are given under Comments.

Species	Ring number	Age/ sex	Site	Known age	Listed 1997	Comments
African Goshawk	5-33442	I.M.	Mit	8.5	no	Not seen between Jul 90–May 98
Cardinal Woodpecker	CC-00593	I.F.	Mit	7.0	no	Not seen between Jan 92–Aug 98
Blackeyed Bulbul	BB-94210	A.F.	VBG	>7.0	no	Not seen between Jan 92–Jan 98
Blackeyed Bulbul	BB-94277	A.F.	LaR	>7.0	no	Not seen between Jul 92–Oct 98
Stripecheeked Bulbul	BB-55998	A.M	VBG	>9.0	no	Not seen between Feb 93–Mar 99
Stripecheeked Bulbul	BD-05665	A.F.	VBG	>7.0	no	Not seen between Mar 93–Apr 96
Kurrichane Thrush	4-81551	A.M.	VBG	>7.5	yes	Not seen since Nov 96
Olive Thrush	4-81567	A.F.	VBG	>7.0	yes	Not seen since Oct 96
Olive Thrush	4-81561	A.M.	VBG	>7.0	yes	Not seen since May 96
Barthroated Apalis	AB-69208	A.F.	VBG	>8.0	yes	Not seen between Jun 92–Apr 96
Paradise Flycatcher	AA-91813	A.M.	Mit	>9.0	no	Not seen between Oct 91–Oct 97
Longtailed Wagtail	F-17350	A.M.	VBG	>8.5	yes	Present throughout
Olive Bush Shrike	BD-05629	A.F.	MtH	>7.0	no	Not seen between Nov 92–Jul 98
Malachite Sunbird	AD-01434	A.F.	MtH	>7.0	no	Not seen between Oct 92–Oct 98
Bronze Sunbird	AA-65742	I.M.	VBG	12.5	yes	Not seen since Jul 96
Bronze Sunbird	AB-69204	A.M.	VBG	>7.5	yes	Not seen since Aug 96
Bronze Sunbird	AA-91665	A.F.	VBG	>7.0	yes	Not seen since Nov 96
Bronze Sunbird	AA-91537	A.F.	VBG	>7.0	yes	Not seen since Oct 96
Bronze Sunbird	AD-01444	A.M.	MtH	>7.0	no	Not seen between Sep 93–Nov 98
Bronze Sunbird	AD-01461	A.M.	MtH	>7.0	no	Present throughout
Bronze Sunbird	AD-01450	I.F.	MtH	7.0	no	Not seen between Feb 95–Oct 98
Miombo Sunbird	AB-69397	A.M.	LaR	>9.0	yes	Not seen between Feb 95–Oct 98
Miombo Sunbird	AB-69322	I.M	LaR	8.5	yes	Present throughout
Miombo Sunbird	X-62872	A.M.	Mit	>8.0	yes	Not seen between Feb 94–May 97
Yellowbellied Sunbird	X-84416	A.F.	MtH	>7.0	no	Not seen between Sep 92–Aug 98
Olive Sunbird	AB-69313	A.M.	LaR	>9.0	yes	Not seen between Nov 90–Jan 96
Olive Sunbird	AA-91798	A.M.	VBG	>8.5	yes	Not seen between Jun 93–Apr 97
Olive Sunbird	AD-01361	A.M.	LaR	>7.5	yes	Not seen between Jul 92–Jun 96
Olive Sunbird	AA-91896	I.M.	LaR	7.5	yes	Not seen between Jan 94–Dec 96
Olive Sunbird	AD-01527	A.M.	MtH	>7.0	yes	Not seen between Jan 94–Jan 97
Olive Sunbird	X-84549	I.M.	MtH	7.0	no	Probably present throughout
Olive Sunbird	AD-01526	I.M.	MtH	7.0	no	Probably present throughout
Olive Sunbird	X-84504	I.M.	VBG	7.0	no	Not seen between Oct 92–Oct 98
Black Sunbird	AA-91570	I.M.	LaR	7.0	yes	Present throughout
Yellow White-eye	AA-91601	A.M.	LaR	>7.5	no	Probably present throughout
Yellow White-eye	AA-91652	A.M.	LaR	>7.0	yes	Not seen between May 91–Jun 96
Yellowthroated Sparrow	F-02220	A.M.	Mit	>9.5	no	Not seen between Sep 91–Apr 99

Number of birds	37
Number male	25 (67.6%)
Number immature when ringed	10 (27.0%)

Table 6. Year in which each bird, known to have reached four years old or more, was last seen. Each year is divided into July–December and January–June. A line marks the start of the rains in January 1996 and another the cut-off point for data presented by Hanmer (1997).

Age	Year in which last seen													Total
	1993		1994		1995		1996		1997		1998		1999	
	J–D	J–J	J–D	J–J	J–D	J–D	J–J	J–D	J–J	J–D	J–J	J–D	J–J	
12								1						1
11														
10														
9										1	1	1	2	5
8									2	–	–	3	1	6
7								6	2	–	3	14	–	25
6					1	2	6	5	1	5	4	10	7	41
5			2	2	2	2	4	11	5	4	6	9	3	48
4	13	7	5	10	12		5	7	7	3	5	8	1	83
Total	13	7	7	13	16		15	30	17	13	19	45	14	209

Not seen after Dec 95	56	Not seen 1992/3–Jan 96	20
Not seen after Jun 97	62	Not seen 1992/3–July 97	53
	118		73
Seen since Jun 97	29	Seen during drought	18
Total aged >4 at Jun 97	147	Total aged >4 since Jul 97	91

The recapture rate (Table 1, Fig. 1) suggests that a high proportion of those ringed in two relatively wet years (1990/1 and 1992/3) survived the following dry years, whereas those ringed after the drought had a low survival rate; this is unlikely.

The low recapture rate of birds ringed in 1991/2 and between July 1993 and December 1995 may partly be due to death, because many were resident being recaught regularly until late in 1995, but it may in part be due to movement during the drought and the low recapture rate for birds ringed from 1996 is almost certainly due to movement out of trapping areas after good rain; the reappearance of old birds in 1997–99 indicates movement has occurred since the return of wet conditions. These birds must have left trapping areas during the drought and moved to a higher, cooler altitude or into lower, wetter valleys, returning to trapping areas once conditions improved.

Some birds found trapping areas to be suitable for drought conditions and remained, being recaught regularly, but many of these departed once conditions elsewhere improved. Emigration of refugees which remained resident during the drought and departed afterwards, would account in part for the small number of recaptures in 1998/9; birds last seen (Table 6) in late 1995 or in 1996–7 probably have moved out. If refugees moved into trapping areas at the start of the drought it is likely that far more birds passed through sites, than remained to become temporarily resident. If this is so, many birds ringed at the start of the drought, during periods of fluctuating rainfall in the middle of the drought and after the drought were 'in transit' and this would lower recapture rates.

Many recently seen old birds were ringed when adult in 1990/1 (and presumably were residents) or in 1992/3. The latter may have been residents which were not caught in the previous two years; they may not have been present during part of that time, having

moved out in 1991/2 and returned in the following, wetter year. Few birds ringed in 1991/2 have been recaught and it is probable that many of them were transients which had no reason to return to where they were ringed, since it was never 'home'.

The four sites (Fig. 2) show erratic recapture rates, but movement during and after the drought could account for this with site differences due to different proportions of residents which remained or returned, temporary residents and transients. The graphs do make sense if low percentage recapture relates to a high proportion of transients in the population being ringed and a high percentage to residency, even if temporary.

Age

At Nchalo in the lower Shire valley of Malawi, over 16 years 34.6% of birds ringed when immature lived to at least seven years old (Hanmer 1989, given incorrectly by Hanmer (1997) as 31%.). At Eastern Highlands sites (Table 2) only 27% of immature-ringed birds were recaught after at least one year, although the figures for La Rochelle and Mountain Home are 31.5%. and 37.9% respectively and for Mitsasa and Vumba Gardens, 19.5% and 17.7% respectively. Among older birds (Tables 4 & 5), immature-ringed birds aged four or more make up 26.3% and of those aged seven or more, 27.0%.

Immatures tend to disperse from natal areas, so a low recapture rate at a ringing site is to be expected. Immature mortality, due to wandering into unsuitable habitat or lack of experience must reduce the number of ringed immatures. However, the difference in immature recapture between Eastern Highlands sites is considerable, with dissimilar sites producing similar results.

At Mitsasa, few birds hatched there remained as adults and most young birds ringed there were probably in transit, apart from some small seed-eaters during and just after the drought. At Vumba Gardens a similar situation may have occured, except that it was mainly young sunbirds which became resident. At La Rochelle and Mountain Home more young birds became resident or returned regularly. Most of these were sunbirds, caught when *Aloe*, *Protea* and *Cestrum* spp. were in flower, which was not the case at Vumba Gardens, where the main aloe patch is outside the trapping area and there are few proteas or cestrum. It is likely that many immature-ringed birds recaught at La Rochelle and Mountain Home were not in fact resident within the trapping area, but returned regularly when a prime food source was available.

Far fewer immature-ringed birds were recaught years later in the Eastern Highlands than in the lower Shire valley, yet many species are the same. In the Eastern Highlands many sunbirds were ringed, while at Nchalo there was no major food source to attract them, so fewer were ringed and birds were not drawn in from the surrounding countryside to increase the number which appeared to be resident. Therefore, if sunbirds are excluded from recapture totals the percentage of immature-ringed birds which have been recaught in the Eastern Highlands is much lower than found at Nchalo. Either immature dispersal at Nchalo was less, or, more probably, immature survival there was far greater than in the Eastern Highlands during a severe drought.

Longevity

Tables 4–6 show the 209 birds known to have reached four or more years old at all sites and the 37 which reached seven or more despite the drought. As appears to be normal among bush birds (Hanmer 1989), a high proportion are male, suggesting that males are either more resident and faithful to an area, or that they do live longer; the increased percentage of males in the seven year old group suggests the latter.

Most of the old birds are insectivorous or omnivorous (as at Nchalo (Hanmer 1989)), suggesting that, even under drought conditions in the Eastern Highlands their food was less of a limiting factor than it was for seed-eaters. Size is a determining factor in longevity, but when small warblers, sunbirds and white-eyes can reach seven or more years old, while small seed-eaters seldom reach five

even under good conditions, food and water must be limiting factors. At Mitsasa the five waxbills aged 4–6 years probably survived on supplied seed and water, while at Mountain Home the other five (swee, twinspot and fire-finches) had water and the nearby montane grasslands presumably supplied sufficient food. No small seed-eaters ringed at Vumba Gardens have reached four years old, yet conditions seem similar to Mountain Home; perhaps the montane grasslands are too far from the trapping site and birds which moved there have not returned.

Open country birds may survive better than forest or dense vegetation birds, since they form 58% of those four or more years old and 54% of those over seven. This may not be a valid comparison, because fewer forest birds have been ringed and the recapture rate inreases in the older group. However it is a subject worth pursuing, as habitat may have some bearing on longevity. Hanmer (1984) found adult Terrestrial Bulbuls *Phyllastrephus terrestris* to live significantly longer than Blackeyed Bulbuls at Nchalo and suggested lower predation in dense thickets as the cause. It may be that forest birds, although long-lived, are dependent on the high humidity found in a montane forest. Drought could reduce this to unacceptable levels, leading to a greater movement out of trapping areas than occured among open country birds, with a lower or slower rate of return. Alec Manson (pers. comm. 1993) considered that he lost 70% of the Seldomseen forest birds during 1991/2, far more than had disappeared from my more open sites at that time (apart from Mitsasa, where nearly everything had gone), but many old Seldomseen birds reappeared in 1998/9; they had moved, not died.

Conclusion

Birds can survive both the normal extremes of the Eastern Highlands climate and episodes of extended drought, although insectivorous and omnivorous species survive better, perhaps because seed and water are limiting factors, whereas insect numbers remain reasonably high even under dry conditions.

The main element of their survival strategy is their ability to move from unsuitable areas either up to cooler altitudes which generally receive more rain or down into valleys with permanent water. Adults tend to return to previously held territory when conditions improve. Both species and individuals may differ in whether or not a bird continues to move during hard times or becomes temporarily resident in a refuge.

Immature birds, which normally disperse after the breeding season, may be less successful in finding a suitable residential areas especially during harsh conditions, hence having a lower survival rate than adults. The recapture rate of immatures in the Eastern Highlands during a drought, suggests that young birds had a much lower survival rate than was found at Nchalo, Malawi.

Males live longer than do females and open-country birds may live longer than do those of forest and dense vegetation although this could have been a drought effect; it needs further investigation.

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Morphometrics and weights of birds in the Free State, South Africa

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Introduction

Most measurements of southern African birds have been taken from living, but not sexed, birds caught for ringing. As a result, there is a lack of morphometric data distinguishing between males and females (Maclean 1993). For example, no such data is available for the Blacksmith Plover and Spotted Dikkop. Little is also known about regional variations in measurements for most species in southern Africa (Brown *et al*. 1982, Urban *et al*. 1986) and about the correlation between measurements of main body parts. This article describes the results of an investigation of the morphology of 154 birds of five species.

Material and methods

Most of the birds were obtained from the airport at Bloemfontein during the years 1993–96. Starlings were shot near Excelsior, eastern Free State, during winter 1993 (*cf*. Kopij in press). Birds were sexed by gonadal examination. Body weight was determined to the nearest gram using a Soehnle battery balance. The following measurements were taken – the wing-length: from the carpal joint to the end of the longest primary feather; tail-length: from the base of the tail to the longest rectrices; tarsus (tarsometatarsus)-length: from the tarsal joint to the base of the foot; culmen-length: from the unfeathered base of the beak to its tip.

The t-test was used to determine the significance of the differences between means of male and female measurements and weights.

Results

Whitewinged Korhaan *Eupodotis afroides* (Table 1)

The Whitewinged Korhaan shows quite obvious sexual dimorphism. In males the bell, neck and much of the head are black, while in females only the bell is black. Males are also significantly heavier than the females (p = 0.04), and have longer culmens (p = 0.04) and wings (p = 0.06). Kok & Van Zyl (1996) have also found significant differences in the body weight between male and female White-

Table 1. Measurements and weights of the Whitewinged Korhaan in the central Free State.

Sex	Value	Wing	Tail	Tarsus	Culmen	Weight
Male (M)	Minimum	238.0	116.0	90.0	33.0	730.0
	Maximum	308.0	136.0	102.0	44.0	942.0
	Mean	283.1	128.6	95.0	38.4	781.7
	SD	13.2	6.3	2.9	3.3	192.3
	N	21	19	21	20	20
Female (F)	Minimum	265.0	121.0	84.0	31.0	732.0
	Maximum	285.0	142.0	95.0	41.0	910.0
	Mean	277.3	130.9	90.2	36.4	790.1
	SD	6.0	6.2	3.8	3.1	45.7
	N	15	15	15	15	15

Table 2. Measurements and weights of the Blacksmith Plover in the central Free State.

Sex	Value	Wing	Tail	Tarsus	Culmen	Weight
Male (M)	Minimum	197.0	84.0	67.0	25.0	152.0
	Maximum	225.0	96.0	82.0	34.0	192.0
	Mean	215.6	89.5	74.8	30.0	169.4
	SD	13.0	3.1	3.8	2.1	14.2
	N	25	25	26	25	26
Female (F)	Minimum	192.0	81.0	64.0	27.0	142.0
	Maximum	230.0	98.0	79.0	34.0	188.0
	Mean	213.2	89.9	72.1	29.6	164.8
	SD	7.4	3.8	3.7	2.1	11.6
	N	33	31	30	32	32

Table 3. Measurements and weights of the Spotted Dikkop in the central Free State.

Sex	Value	Wing	Tail	Tarsus	Culmen	Weight
Male (M)	Minimum	227.0	107.0	91.0	35.0	416.0
	Maximum	250.0	128.0	107.0	42.0	536.0
	Mean	240.9	120.9	98.4	38.6	487.8
	SD	7.3	6.5	5.4	2.0	39.1
	N	10	9	8	9	10
Female (F)	Minimum	230.0	117.0	89.0	35.0	410.0
	Maximum	248.0	131.0	112.0	43.0	544.0
	Mean	239.0	121.3	97.1	38.8	476.0
	SD	6.3	4.2	6.4	2.5	41.6
	N	10	10	10	10	10

winged Korhaans breeding in the Free State. The tail- and tarsus-lengths remain much the same in both sexes ($p = 0.14$ and 7.73 respectively). The wing- and tarsus-lengths increase when body weight increases. The tail-length is not correlated with the wing-length and the culmen-length is not correlated with the tarsus-length.

Table 4. Measurements of the Pied Starling in the central Free State (male & female).

Value	Wing	Tail	Tarsus	Culmen
Min.	14.7	9.3	3.6	2.1
Max.	15.9	10.3	4.1	2.9
Mean	15.4	9.7	3.9	2.3
SD	0.4	0.3	0.1	0.2
N	15	15	15	14

Blacksmith Plover *Vanellus armatus* (Table 2)

In the Blacksmith Plover only the tarsus-length is significantly longer in males than in females ($p = 0.004$). This study found statistically significant sexual differences in the body weight of Blacksmith Plovers. Kok & Van Zyl (1996) found similar differences in their study of Free State Blacksmith Plovers. No correlation between the increase in the body weight and the wing- and tarsus-length is noticeable. The tail-length increases with the wing-length, and the culmen-length increases with the tarsus-length.

Spotted Dikkop *Burhinus capensis* (Table 3)

No statistically significant sexual differences in measurements and weights were found between male and female Spotted Dikkop. With increasing body weight, wing-length

Table 5. Measurements and weights of the Wattled Starling wintering in the central Free State.

Sex	Value	Wing	Tail	Tarsus	Culmen	Weight
Male (M)	Minimum	11.5	6.5	2.9	2.1	75.0
	Maximum	12.2	7.2	3.2	2.4	88.0
	Mean	11.9	6.9	3.0	2.2	82.0
	SD	0.2	0.2	0.1	0.1	4.3
	N	8	8	8	8	8
Female (F)	Minimum	11.2	6.6	2.8	2.1	66.0
	Maximum	12.4	7.1	3.0	2.3	76.0
	Mean	11.7	6.9	2.9	2.2	71.7
	SD	0.5	0.2	0.1	0.1	4.2
	N	7	7	7	7	7
Unsexed	Minimum	11.0	6.5	2.7	2.1	–
	Maximum	12.2	7.5	3.1	2.4	–
	Mean	11.6	6.8	2.9	2.3	–
	SD	0.4	0.4	1.1	0.1	–
	N	10	10	10	10	–

decreases, and the tarsus-length increases slightly. The tarsus-length is slightly correlated with the culmen-length, but a correlation is not obvious between the tail- and the wing-length. Kok & Van Zyl (1996) did not record any statistically significant differences between the weights of 63 males and 24 females.

Pied Starling *Spreo bicolor* (Table 4)

Measurements of only 14 Pied Starlings were taken, and the birds were not sexed. Kok & Van Zyl (1996) have recorded statistically significant differences in the body weights between males and females Pied Starlings.

Wattled Starling *Creatophora cinerea* (Table 5)

No statistically significant differences between male and female measurements and weights were found between non-breeding males and females Wattled Starling. Kok & Van Zyl (1996) also did not record statistically significant differences in the body weight between male and female Wattled Starlings.

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Editor's note

More weights are listed in:

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Mass loss in Masked and Cape Weavers and Redbilled Quelea

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Introduction

Diurnal birds lose weight overnight and this weight must be regained during the day. Although many weight lists have been published, no studies on weight loss have been undertaken in South Africa, although there have been many elsewhere (e.g. Ens *et al*. 1990). In this study Masked Weavers *Ploceus velatus*, Cape Weavers *P. capensis* and Redbilled Queleas *Quelea quelea* were trapped en route to their roosts to record their weights in the evening and mass loss overnight. These species, particularly the latter, are agricultural pests and the weight losses indicate the minimum amount of food (by mass) that must be eaten daily by a single bird.

Study sites and methods

The Masked Weavers were trapped at the CSIR (25°44'S, 28°16'E) in suburban Pretoria, Gauteng province. Several different roosts were used by large flocks of this species. One of the main roosts was a very dense patch of reeds at the edge of the main dam at the CSIR. Birds forage along the Moreletaspruit and in suburban gardens near the CSIR during the day. Birds were trapped at the CSIR wetland or on a kopje over which the birds flew to their roost. Three sets of birds were trapped on different occasions. Seven birds were trapped on 8 April 1996; 11 birds on 14 May 1996; and 32 on 7 April 1997. The data are combined since the time of year is similar over the three data sets, with a total of 50 birds. Most of the birds were immatures and were not sexed (but six birds were sexed as immature males and three as adult males).

The Cape Weavers were trapped at Betty's Bay, (34°21'S, 18°55'E) Western Cape on 27 June 1987 by L.G. Underhill. The birds (n = 31) were weighed and kept overnight in two boxes.

The Redbilled Queleas were trapped by a team of ringers led by Sam de Beer and Andries Nel at De Paarl (26°04'S, 25°55'E) near Lichtenburg, North-West Province, on 6 September 1997 between 17h35 and 18h15. Fifty birds were kept of several thousand birds caught. The birds were full grown but not sexed because males were not in breeding plumage.

Ten Redbilled Queleas were trapped at Hattingspruit Dam (28°04'S, 30°07'E) near Dundee, KwaZulu-Natal, on 14 December 2000 between 17h20 and 18h10. These birds were weighed three additional times during the night to determine rate of mass loss. Four birds were males, and six were females.

The methodology was the same for all species. Birds were trapped in one or more 12 m mistnets as they returned to the roosts in the evenings. Time of capture was recorded for the Masked Weavers and the Hattingspruit quelea. The birds were weighed in the bags, taken out and ringed, and bag weight and time were recorded. The birds were kept in the same bags and kept overnight inside buildings at room temperature (without any heating). In the morning the birds were weighed (in the same chronological order), bag weight and time were recorded and each bird was released approximately 12 hours after capture. Weights were recorded with a 50 g Pesola balance (0.5 g intervals). The individual time differences and weight differences were calculated for each individual bird.

To test if the weight loss was linear or exponential, the Hattingspruit quelea were

Table 1. Weights on evening capture and release on following morning, and percentage weight loss per hour in three weavers.

Species	n		Mean (g)	Range (g)	SD	% Loss/h
Cape Weaver	31	initial mass	45.5	37.7–50.9	4.2	0.5
		release mass	42.7	35.0–48.2	4.1	
Masked Weaver	50	initial mass	26.3	21.1–33.1	3.3	0.7
		release mass	24.0	19.5–30.3	2.9	
Redbilled Quelea (De Paarl)	50	initial mass	20.9	17.1–23.3	1.3	1.1
		release mass	18.0	15.2–20.0	1.1	
Redbilled Quelea (Hattingspruit dam)	10	initial mass	19.4	17.8–21.2	1.2	1.0
		release mass	17.2	15.6–18.5	1.1	

weighed twice during the night in addition to the capture and release weights. The first additional weight was about two hours after capture, then two and a half hours after that to concentrate on the initial rate of loss.

Results

Weights

The mean mass of Cape Weavers caught in the evening was 45.5 g (SD 4.2, range 37.7–50.9 g, n = 31). The following morning these birds weighed 42.7 g (SD 4.1, range 35.0–48.2 g, n = 31).

The mean mass of Masked Weavers caught in the evening was 26.3 g (SD 3.3, range 21.1–33.1 g, n = 50). The following morning these birds weighed 24.0 g (SD 2.9, range 19.5–30.3 g, n = 50).

The Redbilled Queleas from De Paarl weighed 20.9 g (SD 1.3, range 17.1–23.3 g, n = 50) in the evening and 18.0 g (SD 1.1, range 15.2–20.0 g, n = 50) on the following morning.

The Redbilled Queleas from Hattingspruit weighed 19.4 g (SD 1.2, range 17.8–21.2 g, n = 10) in the evening and 17.2 g (SD 1.1, range 15.6–18.5 g, n = 10) on the following morning.

These weight ranges lie within those given by Maclean (1985).

Overnight weight losses

Percentage mass loss per hour was calculated as a measure comparable across species (Table 1). In Cape Weavers weight loss was on average 2.8 g (6.1% of initial weight) over 11.8 hours, i.e. 0.5% loss/hr. In Masked Weavers weight loss was on average 2.3 g (8.5% of initial weight) over 12 hours, i.e. 0.7% loss/hr. In Redbilled Queleas from De Paarl weight loss was on average 2.9 g (13.7% of initial weight) over 12.9 hours, i.e. 1.1% loss/hr. In Redbilled Queleas from Hattingspruit weight loss was on average 2.2 g (11.3% of initial weight) over 11.4 hours, i.e. 1.0% loss/hr. The percentage mass loss per hour assumes that the weight loss is linear during the night.

Rate of overnight weight losses

The rate decreases more quickly initially and then more slowly (Fig. 1). Visually this rate appears to lie between a linear decrease and an exponential decrease.

Discussion

The Cape Weavers lost 6.1% of their mass overnight, Masked Weavers lost 8.5% and the Redbilled Queleas lost 11.3–13.7% of their evening weights. Because the birds were trapped near the roosts, it is valid to use the evening weights as the final maximum weights. Ginn (1971) conducted a similar weight loss experiment in Masked Weavers and the quelea, though with few individuals, in May 1970 in Zimbabwe. One Masked Weaver lost 8.6% of its weight, while four

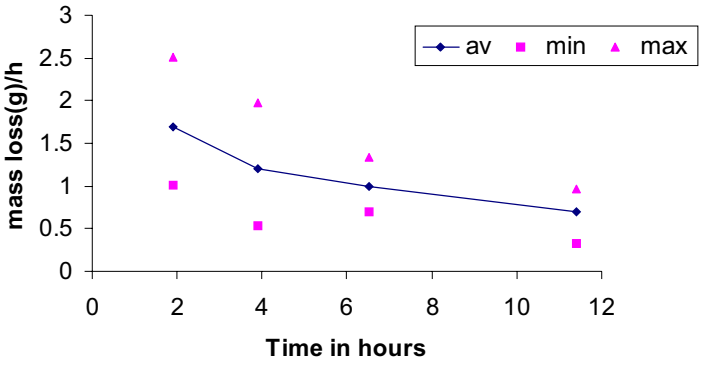

Fig. 1. Mass loss per hour in 10 Redbilled Quelea kept overnight.

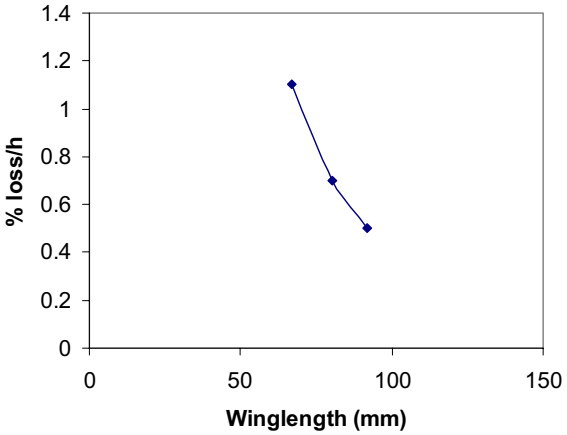

Fig. 2. Percentage overnight mass loss versus weaver size (i.e. wing-length). An exponential curve has been fitted.

Redbilled Queleas lost an average of 13.8%. These results correspond very closely with those obtained in this study (Ginn did not record the hours that the birds were kept, but it was presumably also close to 12 hours).

Ward (1965) weighed queleas in the mornings and evenings (not the same birds kept overnight) and found that males increased their weight during the day by 6.3% and females by 4.8% (p. 202). Queleas lost as much as 17% during experiments on a hot day (Brown & Tinney 1998).

Although the weight is not lost evenly during the night, the hourly average may be used to compare different species (as long as the total night period is used). The average hourly loss is 0.5% in Cape Weavers, 0.7% in Masked Weavers and 1.0–1.1% in Redbilled Quelea. This is in inverse order of the species' size (mean wing length of males 92, 80.3, 67 respectively, Maclean 1985). It may be possible to derive a predictive relationship between these two variables (Fig. 2), although some more weavers need to be weighed, especially some larger ones, e.g. Whitebrowed Sparrowweaver *Plocepasser*

mahali. The smaller the bird the higher the expected metabolic rate, resulting in a greater weight loss overnight.

These values could be used as minima quantities of food consumed per bird per day, though biology of the bird needs to be considered (e.g. type of food eaten in different seasons). Bruggers & Elliott (1989) provide estimates of damage by quelea to crops, in which food amount consumed is needed.

Acknowledgements

Les Underhill provided the Cape Weaver data and also gave helpful comments on this paper. Sam de Beer organised the ringing trip to De Paarl, which was sponsored by the Department of Agriculture (Resource Utilization). The Pretoria Bird Club is thanked for their sponsorship while ringing Masked Weavers in Pretoria.

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Masked Weavers roosting in reeds at the CSIR. Photo by H.D. Oschadleus.

Phakalane sewage lagoons: a summary of nearly five years of ringing effort

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From July 1996 to March 2001 I have, somewhat irregularly, ringed at various locations within Phakalane sewage lagoons. This site lies 15 km north of Gaborone in south-east Botswana and covers 100 ha, including 75 ha of water and reedmace *Typha capensis* and 25 ha of grassland, bunds, *Acacia* bush and woodland (see Tyler & Tyler 1997a, b). The lowest part of the site lies adjacent to the Ngotwane River with its narrow fringe of riparian woodland. In 1997 the results of one year's ringing was reported (Tyler & Tyler 1997a); this article updates that report and is complete to the end of March 2001.

The distribution of ringing effort over the years was very uneven, as shown by the number of visits in three-month periods (Fig. 1). A ringing visit was either in the early morning or late afternoon. When I stayed overnight at the site and therefore had both an evening and an early morning trapping session, this was counted as two visits (Fig. 1). Only one visit was made in each of the first two three-month periods but increased effort was expended in the November 1996/January 1997 and February/April 1997 periods. Winter visits in May/July 1997, 1998 and 2000 were rather few, and throughout the winter of 1999 to the summer of early 2000 ringing almost ceased because pumps feeding sewage to the site had failed and the lagoons largely dried up. This resulted in the reeds drying out and vandals then setting fire to them. Despite this degradation, with the repair of the pumps in 2000 and water filling the lagoons, the reeds soon recovered.

A total of 3975 birds of 68 species was caught during the study period, many being common birds of the adjacent *Acacia* savanna and woodland (Table 1). Biometric data for some species are provided in Appendix 1, but data for 'reed' warblers *Acrocephalus* spp. and Little Rush Warbler *Bradypterus baboecala* species are reported elsewhere (Tyler *et al*. 1997; Tyler & Tyler 1997b; Tyler 2001; Tyler in prep.).

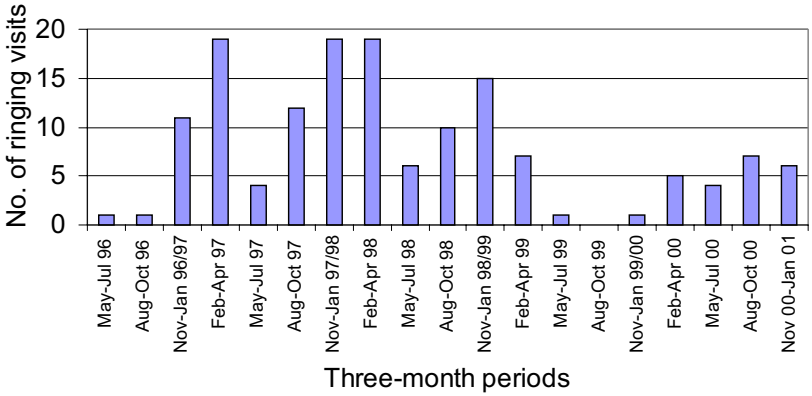

Fig. 1. Ringing effort at Phakalane.

The first year was characterised by large numbers of Palaearctic migrant warblers, notably European Sedge Warblers *Acrocephalus schoenobaenus*, Reed Warblers *A. scirpaceus* (Tyler & Tyler 1997b) and a rare vagrant, a Basra Reed Warbler *A. griseldis* (Tyler *et al.* 1997), during the January to March period of 1997. The high numbers were not repeated in subsequent seasons although European Sedge Warblers were trapped commonly in all four summers. Penry (1994) described *A. schoenobaenus* as sparse to uncommon, and very localised in northern and eastern Botswana, with no obvious passage movement. In the late 1990s the species was, however, common at many sites in the north and east, and at Phakalane S.P. a marked passage was evident, especially in early April when thousands of birds were feeding around the edges of the lagoons. European Reed Warblers and Great Reed Warblers *A. arundinaceus* were present in all

Table 1. Numbers of each species caught at Phakalane S.P. between July 1996 and February 2001.

Species	No. ringed	Species	No. ringed
Black Crake	5	Willow Warbler	29
Threebanded Plover	2	Longbilled Crombec	6
Blacksmith Plover	2	Greybacked Camaroptera	5
Blackwinged Stilt	1	African Barred Warbler	1
Wood Sandpiper	6	Fantailed Cisticola	18
Ruff	1	Desert Cisticola	1
Cape Turtle Dove	2	Rattling Cisticola	95
Laughing Dove	1	Tawnyflanked Prinia	148
Emeraldspotted Wood Dove	1	Blackchested Prinia	31
Jacobin Cuckoo	1	Marico Flycatcher	12
Diederick Cuckoo	3	Fiscal Flycatcher	3
Burchell's Coucal	4	Cape Wagtail	1
Malachite Kingfisher	2	Redbacked Shrike	9
Brownhooded Kingfisher	1	Brownheaded Tchagra	1
Bluecheeked Bee-Eater	2	Marico Sunbird	10
European Swallow	61	Whitebellied Sunbird	1
Lesser Striped Swallow	1	Scalyfeathered Finch	3
European Sand Martin	2	Masked Weaver	113
Whitethroated Swallow	1	Lesser Masked Weaver	7
Forktailed Drongo	2	Redbilled Quelea	280
Southern Black Tit	1	Red Bishop	363
Ashy Tit	1	Golden Bishop	41
Redeyed Bulbul	1	Whitewinged Widow	297
Stonechat	2	Melba Finch	17
Whitebrowed Robin	13	Jameson's Firefinch	1
Kalahari Robin	1	Redbilled Firefinch	34
Titbabbler	3	Orangebreasted Waxbill	239
Great Reed Warbler	96	Blue Waxbill	7
Basra Reed Warbler	1	Common Waxbill	308
European Reed Warbler	106	Blackcheeked Waxbill	2
African Reed (Marsh) Warbler	863	Quailfinch	10
European Marsh Warbler	8	Pintailed Whydah	9
Lesser Swamp (Cape Reed) Warbler	193	Rock Bunting	1
European Sedge Warbler	473		
Little Rush (African Sedge) Warbler	9	**Total (68 species)**	**3975**

Table 2. First and last dates of three species of Palaearctic warblers in four summers. In the summer of 1999/2000 no early visits were made because of the burnt reeds and dry lagoons. In 2000/2001 ringing only occurred at Phakalane S.P. up to November 2000 and again in late February and late March 2001. Brackets indicate fewer early ringing sessions.

	A. scirpaceus		*A. arundinaceus*		*A. schoenobaenus*	
	First date	**Last date**	**First date**	**Last date**	**First date**	**Last date**
1996/97	2 November	10 April	31 December	23 March	1 November	10 April
1997/98	7 November	19 March	21 November	5 March	29 October	19 April
1998/99	18 December	18 March	8 December	11 February	18 December	20 April
1999/2000	(28 January)	7 April	–	31 March	(28 January)	7 April
2000/2001	(23 March)	(24 March)	(22 February)	(24 March)	28 November	(24 March)

summers. However, these species were caught in lower numbers in successive seasons.

Arrival dates varied between years with European Sedge and Reed Warblers being early migrants in 1996/97 and 1997/98 (Table 2). During nine visits between 30 October and 8 December in 1998, no European Sedge or Reed Warblers were caught, although a Great Reed Warbler was caught on 8 December. The first Reed and Sedge Warblers were not caught until 18 December. In 1999/2000 there were few visits until early 2000 because of the degraded nature of the site. In 2000/2001 weekly visits were made in late October and throughout November but the first European Sedge Warbler was not caught until 28 November. No European Reed, Great Reed or Marsh Warblers were caught at Phakalane S.P. in October or November 2000, although Great Reed Warblers were caught in late February 2001 and two European Reed Warblers in late March 2001. At Francistown Sewage Ponds, some 430 km to the north of Phakalane, a European Sedge Warbler and three Great Reed Warblers were, however, caught on 12 November (N. Bousfield pers. comm.). Prior to 2000, Great Reed Warblers had not been caught at Francistown until early December.

Site fidelity by Palaearctic species to the non-breeding site at Phakalane between the first two summers was highest for European Reed Warblers (11.3% return rate, n = 53), compared with Great Reed (see Tyler 2001) and European Sedge Warblers (3.65%, n = 165). Hanmer (1989) similarly found a 9.6% return for Great Reed, 18.2% for European Reed and only 2.2% for European Sedge Warblers in Malawi.

The partial migrant African Marsh Warbler *A. baeticatus* showed very high site fidelity. Some 44% of birds ringed in the first year were re-trapped a month or more after first capture and 29% of birds ringed in the first year were re-trapped more than six months later in a subsequent season (Tyler, in prep.). Even within the site, birds were very faithful to particular patches of reedmace, with very few recaptures between different ringing locations within the sewage lagoons. Some birds caught at Phakalane may be passage birds as I controlled a bird in September 1998 that had first been ringed in December 1995 at Bishop's Glen, Bloemfontein, some 494 km away, by A.J. Kotze (Oschadleus 1999). Hanmer (1989) noted a 19.6% return for Cinnamon Reed Warbler *A. cinnamomeus*, a close relative of *A. baeticatus* and considered by some as a subspecies.

Not surprisingly, Red Bishops *Euplectes orix*, Golden Bishops *E. afer* and Whitewinged Widows *E. albonotatus* were caught in relatively large numbers (see Table 1). They were mist-netted mainly at dusk when coming to roost, but all three species

Table 3. Numbers of Orangebreasted Waxbills caught in each month that were undergoing primary moult (score 1–49). One bird in late March also showed interrupted moult.

Moult score	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1–10							6	4	3	0	0	
11–20							9		6	7	3	
21–30							2			2	6	
31–40							0				4	
41–49			1				1					

bred locally. Many more bishops, widows and Redbilled Quelea *Quelea quelea* than noted in Table 1, were extracted from nets but were released without rings, especially if the catch came at dusk.

Common Waxbills *Estrilda astrild* and Orangebreasted Waxbills *Sporaeginthus subflavus* were both common, the former more so. Moult in Common Waxbills occurred between February and May but Orangebreasted Waxbills moulted between July and December, with just one record of a bird in moult in March (Table 3). Most of the Pintailed Whydahs *Vidua macroura* that were ringed were caught as juveniles with flocks of Common Waxbills. The ten Quailfinch *Ortygospiza atricollis* were caught in the winter of 1998 when a small flock came to drink in a muddy trampled net ride through the reedmace.

Rather few birds were present in the reedmace during the winter months. Some African Reed Warblers did over-winter, along with Lesser Swamp Warblers *A. gracilirostris*, and winter visitors included Stonechat *Saxicola torquta* and Fiscal Flycatcher *Sigelus silens*. One Stonechat was re-trapped in a subsequent winter.

Acknowledgements

I am grateful to all the many people who have helped me over the four years at Phakalane. Particular thanks go to my husband, Lindsay Tyler, for cheerfully agreeing to stay overnight at Phakalane 'yet one more time' and for his help with extracting birds. I am grateful to visiting ringers from the UK for their assistance: Felicity Burge, John Flynn, Steve Dodd, Phil Ireland and Glenis Vowles and especially Jerry Lewis who came back for a second year. Local ringers, trainees and 'would-be ringers' who have all helped over the years include Tracy Buchan, Jenny Bowen-Davies, Pauline French, Christine Orchard, James Stone and Glen Slade.

I gratefully acknowledge Gaborone City Council for permission to ring birds at Phakalane sewage lagoons and the Office of the President for granting me a research permit to carry out the work.

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Appendix 1

Wing and weight measurements of thirteen species caught at Phakalane S.P. between July 1996 and November 2000.

Species	Wing				Weight			
	No.	Mean	Range	SD	No.	Mean	Range	SD
Little Bittern	3	138	136–141	2.7	3	108	106–109	1.5
Black Crake	5	106	94–116	8.1	4	84.9	75.5–92	6.9
Burchell's Coucal	4	165	158–175	7.2	4	163.9	142–181	16.2
Bluecheeked Bee Eater	2	146	142–150	5.7	2	49.9	48.8–51	1.6
Tawnyflanked Prinia	92	50.6	46–55	2.1	90	9.1	7.5–12	0.9
Fantailed Cisticola	18	51.1	46–58	3.1	16	9	7.8–10.5	0.8
Common Waxbill	272	50.7	47–55	1.4	227	8.65	6.9–12	0.8
Orangebreasted Waxbill	199	46.9	44–50	1.0	171	7.7	5.8–10.5	0.8
Quailfinch	10	55.9	55–57	0.8	10	11.4	10.5–12.7	0.8
Pintailed Whydah	9	67.2	60–72	4.2	8	13.9	11.5–15.5	1.3
Whitewinged Widow	262	69.6	61–81	4.5	260	19.6	14.5–26.6	2.4
Golden Bishop	27	64.9	60–71	2.5	27	15.3	13.6–20.6	1.5
Red Bishop	51	73.5	64–81	4.2	49	23.5	17.3–31.5	3.2

A reassessment of plumage characters in ageing Antarctic Terns

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Introduction

A tentative method of ageing Antarctic Terns *Sterna vittata* on plumage characteristics and moult was attempted by Tree & Klages (1998) based on data collected during a visit to Bird Island, Algoa Bay, in July 1998. Further work was carried out in late June and early September 1999 and during August and early September 2000 and birds ringed in the earlier seasons were recaptured, thus allowing for a reassessment of some of the features originally used. Further access to the available literature has expanded our knowledge of the situation relating to breeding and post-breeding plumage change in their natal areas. Throughout the extensive breeding range of this species egg-laying may take place any time from late October through to March. This very protracted breeding season of some four-and-a-half months gives rise to a very extended post-breeding moult and to a parallel sequence of juvenile and post-juvenile plumages. Further, Parmalee (1987) found that post-breeding birds collected in the vicinity of Anvers Island, Antarctic Peninsula, showed very variable body moult in that some specimens moulted quickly through non-breeding dress back into full nuptial dress whilst others took longer to complete moult with occasional birds still in non-breeding dress in September. This variability within a single population can only be exaggerated throughout the range of the species.

The following replaces that which appeared in the earlier paper.

Description

1. Bill colour

As in Tree & Klages (1988).

2. Crown cap

First year. White frons to mid-crown, streaking slightly into remainder of grey-black rear crown and nape.

Second year. Similar to first year birds with some very pale grey streaking appearing later in the season and advanced birds may then be inseparable from retarded third year birds although outer primaries are normally unworn.

Third year. Similar to second year birds but white replaced by a very pale grey, sometimes some white still showing. A few darker, often sharply demarcated, spots may appear on forecrown. Cannot be aged satisfactorily unless ringed earlier at a known age. Treated as adult.

Older. Similar to third year birds but often with some black remaining. The full black cap from the previous breeding season still intact on many birds on arrival up to early August, this being lost fairly rapidly but the degree of moult appears very variable, with some birds retaining or moulting straight back up to 50% of the black crown. Other birds may have black plumage already replaced by August/September.

3. Cheek stripe

First year. None.

Second year. Virtually none, although later in season as some grey underparts patchily assumed the beginnings of the stripe start to appear.

Older. In adult breeding dress a clearly defined white stripe. Some birds in breeding dress may have the stripe less well defined and with some slight grey streaking. It is possible that these are younger birds assuming full dress for the first time. Birds in non-breeding dress show an unclear stripe

dependent on the amount of underpart colouration retained.

4. Underparts

First year. White.

Second year. White. Older birds start assuming a few light grey feathers from July, younger birds from September. The older birds may have a good mixture of white, light and medium grey feathers by departure and may be inseparable from retarded third year birds except for wear on outer primaries.

Older. The grey of the underparts is only partially lost in non-breeding dress when a mixture of shades of grey results. Many adults arrive in this plumage whilst others moult out rapidly after arrival. Thereafter, variable moult back to full plumage. Many birds show mottled shades of grey but this assumes one hue on completion of moult back to breeding dress. It would appear from the small sample obtained to date that the race *sanctipauli*, with its much paler underparts, assumes the full colouration of the underparts as early as August.

5. Primary moult

As in Tree & Klages (1998) except that *Third year* should now be included with the *Older* birds and not treated separately. The range of active moult, even within nominate *vittata*, is very great.

The age structure example shown in the earlier article should now be ignored and we can only safely age first, second and older (adult) age groups. The corrected figures for the total winter catch then stand at first year (6.3%), second year (11.2%) and older (82.5%). That second year birds outnumber first year birds may indicate that the majority of the latter arrive later than the older age groups. This would not be evident in our trapping figures, as we did not catch any later than the 12 September. When trapping at Cape Recife in 1971 first year birds formed a far larger proportion (43%) of the catch with the majority caught in October into November; but there may also be roosting age biases at a mainland site because all 20 caught in August were first year birds. Despite this it still appears that these two age groups form a relatively small proportion of the overall population and this may support observations of the heavy predation of eggs and young suffered by the attentions of skuas, gulls and rats on the breeding grounds (e.g. Higgins & Davies 1996). Obviously there will be annual variation in productivity so a more accurate population structure may only be obtainable after several years work. Mortality after the first two years of life must be very low and potential longevity very high. Maybe some of these birds will even outlive the authors!

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Tree, A.J. & Klages, N.W.T. 1998. Ageing techniques and age structure of a mid-winter roost of Antarctic Tern. Safring News 27(1/2): 15–17.

Erratum

In the article:

Tree, A.J. & Klages, N.W.T. 1998. Ageing techniques and age structure of a mid-winter roost of Antarctic Tern. Safring News 27(1/2): 15–17,
the sentence on page 16, column 2 should be:

'. . . while the very low number of first year (juvenile) birds was also reflected in a count made on the 24th when some 1800 birds were carefully scanned with the aid of a telescope and only seven of this conspicuous age class seen . . .'*(18 000 birds should be 1800.)*

Evidence for eclipse plumage in the Lesser Doublecollared Sunbird

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As far back as 1983 the late Rob Martin wrote in *Bokmakierie* (35: 67) on 'Possible eclipse plumage in the Lesser Doublecollared Sunbird'. The literature up to then had been quite adamant that the male of this species (*Nectarinia chalybea*) did not go into an eclipse plumage and that birds seen in partial adult dress were immature. However, Rob found that during the months of December and January he was unable to find a single male in full adult plumage. Many females and birds showing a trace of red on their chests were found at this time and he asked where the adults were if these birds were immature males? On the strength of this he concluded that most adult males are in eclipse plumage during this period.

He also noted that because the Lesser Doublecollared has a shorter breeding season (June to October) in the south-western Cape than elsewhere, eclipse would be more synchronised there than in areas where the breeding season is longer. The more extended the breeding season, the greater likelihood of some adults being in full nuptial dress in all months, leading observers to conclude that birds in partial breeding dress are immature, not eclipse adults.

At Bathurst, in the Eastern Cape, the severe drought and very intermittent rains of the last two years have resulted in a haphazard flowering of some nectar-rich trees favoured by sunbirds. This in turn attracted sunbirds at times when they do not normally occur in my garden. After an unseasonal, but short, February flowering of a *Schotia afra,* which attracted a flurry of sunbirds, mostly Grey *N. veroxii* but no Lesser Doublecollared (which favour this tree above all others), a Weeping Bottlebrush *Callistemon* sp. briefly came into flower in early March, attracting mainly Lesser Doublecollared Sunbirds. A few of these were caught, including one that had been ringed as an adult male in full nuptial plumage in the previous October. Based on plumage at the time of recapture, this bird would have been treated as a sub-adult male. Both this bird, and another eclipse male caught at the same time, had almost completed moult of the mantle and were in the late stages of moult of the red breast band. However, the heads of both birds were still brown with about 10% and 30%, respectively, glossy green feathers, mainly on the nape. The gapes were checked carefully and found to be the black of the adult. Both birds were a little over halfway through their wing moult and the outer primaries were faded and worn, a feature that would not be seen in an immature at this time of year. Another male caught on 2 April was also assuming nuptial dress and had completed wing moult.

Further support from past records is as follows: indisputable adult males have been caught in Bathurst up to 7 December and not again until 9 March. In my late 1960s ringing records from Grahamstown, where most birds were ringed December/March and June/July, I caught adult males up to 6 December and not again until 10 March. One ringed as a juvenile male, based on plumage and measurements, on 7 December 1967 was recaptured on 28 March 1968 as a sub-adult male; was this bird in eclipse when ringed or was it a definite juvenile? Between those dates I have handled several birds that I aged at the time as immature or sub-adult with birds of the latter age classification caught up until 18 April.

Les Underhill kindly went through the ringing records of the late George Underhill. One bird ringed as an unsexed juvenile on 9

November 1992, was retrapped as an adult male on 3 July 1993. It was again retrapped as an adult male in full nuptials on 9 August 1993 and then on 13 November 1993 as an adult male with 2% nuptial plumage; again retrapped as an adult male on 23 August 1996.

Observations of the seasonal occurrence of sunbirds tend to be biased by observations of males in breeding dress. In the Bathurst area, Lesser Doublecollared Sunbirds appear to be rare or absent during summer: I have very rarely seen birds with traces of breeding plumage in December, and have never seen them in January.

In Zimbabwe I found that the closely related Miombo Doublecollared Sunbird *N. manoensis* virtually 'disappeared' during the December/February period but that the adult males would reappear in the area in the latter half of March. Some of these showed traces of brown plumage on the head in later years. In retrospect I think it very likely that this species may also go into an eclipse plumage and that 'brown-headed' individuals were just completing the transition from eclipse to nuptial plumage.

The earlier findings together with the limited data presented above should offer sufficient proof for the fact that the Lesser Doublecollared Sunbird does have an eclipse plumage and that there is a strong possibility that the same is true for the Miombo Doublecollared Sunbird. Does anyone have documented proof of eclipse in the Greater Doublecollared Sunbird *N. afra*?

I would like to thank Phil Hockey for reading and commenting on the original draft of this article and to Les Underhill for taking on the daunting task of extracting information from his father's copious ringing data.

Male Greater Doublecollared Sunbird. Photo by D.H. Oschadleus.

An East African ringer in Lebanon . . .

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March to May are the main months when Palaearctic migrants are moving north out of Africa and back to their breeding grounds in Asia and Europe. As those moving up the eastern side of Africa reach the northern coastline, many move eastwards to pass north through the Middle East in order to avoid crossing the Mediterranean Sea. This is particularly true for the larger birds such as raptors, storks and pelicans, but large numbers of passerines and smaller non-passerines also pass along this route following the northern-most stretch of the Great Rift Valley which extends from Mozambique all the way to Lebanon and Syria acting as a funnel for migrants moving into Asia.

A particularly attractive feature of this section of the Rift for them is that unlike the surrounding areas of the Middle East, it is green, well-vegetated and relatively well-watered – especially in the spring. Having said this, it is far less well-watered than it once was even a mere 30 years ago. The main area of freshwater marsh in Lebanon, centred around Aammiq, used to stretch some 20 km north to south and fill right across the valley floor for some 10 km.

Today drainage for agriculture along with removal of water for irrigation has reduced the marsh in the spring (when it is almost at it's fullest) to a mere 1 km north to south and 3–4 kms east-west along the main water channel. In summer the marsh is reduced to only two deep pools which just manage to retain water through to when the rains return in the winter. As a result, this relatively tiny wetland is critical for large numbers of birds which rely on it for a stop-over site on migration, a non-breeding/wintering site, or as a breeding site.

It is here that the A Rocha* Lebanon project is based and where I was invited to go for a fortnight of ringing to help re-launch the Lebanese Ringing Scheme after a gap of about 25 years.

The marsh itself consists of areas of open, deeper water, large swathes of *Phragmites* reedbed, and shallower, swampy areas of old flooded fields on either side. The reedbed formed the focus of our mist-netting with a few single panels erected on the fields for larks, pipits and the chance of an odd wader.

On most days 100 m of full height net was put up in the reeds although on the first and last days we doubled this when we had all ringers working together. On the slopes of the mountains just to the west overlooking the marsh, we operated a second ringing site in some stunted oak woodland and thicket to try for a variety of species not found in the marsh. Here 156 m of full height was erected but the numbers of birds was surprisingly low and given the difficulty of working the sites (we shifted to a second site in the second

** A Rocha is an international Christian conservation organisation involved in practical conservation in response to the biblical call to care for all creation. It currently operates in eight different countries (Portugal – the first centre and where the name 'A Rocha' originates, meaning 'The Rock' in Portuguese – France, Lebanon, Kenya, Britain, Czech Republic, Canada and the USA) with possible new projects developing including in South Africa. Activities are focused around research, monitoring and environmental education and training. For further information, write to A Rocha, Connansknowe, Kirkton, Dumfries, DG1 1SX, UK, or visit the web site* www.arocha.org.

week hoping for more birds) on a steep slope. We were rewarded with just 5–6 birds all morning and on the last day this was abandoned and we concentrated on a major 'bash' on the marsh.

Several times during the week we had tried to trap swallows coming in to roost and had varied success, from just one bird on a very windy night, to 148 on a calmer evening.

Altogether we were eight ringers – Colin Beale and Andy Sprenger from the A Rocha Lebanon team, five volunteer ringers from Britain, and myself from Kenya.

The main aim of the fortnight was to kick-start the Ringing Scheme with a bit of a 'bang' by catching a good number of birds. It was also to help Colin and Andy as they tried out different netting sites to gain an understanding as to the numbers of birds one might expect to catch during the spring migration – how many nets are feasible to use, the best net rides, and what species might be expected. As such, it was an excellent fortnight: on 2 May the first bird ringed was a Eurasian Reed Warbler *Acrocephalus scirpaceus* with the ring number 'LIBAN B000001' – the first of a total of 1034 birds ringed of 33 species.

Over the next fortnight, Eurasian Reed Warbler was by far the most common of the 33 species caught, making up a good 34% of the catch. Other common species were, as one would expect, other typical reedbed species with Sedge Warbler *A. schoenobaenus* the next most common (other than the Barn Swallow *Hirundo rustica*), followed by another very similar species, Moustached Warbler *A. melanopogon,* but which has the clearly black or dark legs and a more rounded wing formula. That first day we also caught four Great Reed Warblers *A. arundinaceus* which apparently were a little earlier than the expected date – though in the event we caught some almost every day.

For me, the Moustached Warbler was one that we had searched for in vain when I worked and trained as a ringer for three years at the A Rocha bird observatory in Portugal . . . as was Savi's Warbler *Locustella luscinioides* of which we caught 14 of both races – mostly the nominate but also *fusca*. Certain species that were very familiar to me from my Portuguese ringing days were caught in smaller numbers – Blackbirds *Turdus merula*, Chaffinch *Fringilla coelebs*, Chiffchaff *Phylloscopus collybita*, Blackcap *Sylvia atricapilla*, a single female Sardinian Warbler *S. melanocephala*, and the resident Cetti's Warblers *Cettia cetti* (ringed on the first day or two and later retrapped two or three times).

Others were species I'd seen maybe once in the hand such as Spotted Crake *Porzana porzana*, Eurasian Wryneck *Jynx torquilla*, Blackeared Wheatear *Oenanthe hispanica*, Lesser Whitethroat *Sylvia curruca*, and Wood Warbler *Phylloscopus sibiltrix*, and one or two others were totally new to me including Little Crake *Porzana parva* and several Eastern Bonelli's Warbler *Phylloscopus orientalis*. The crakes we caught in a crake trap design that we had used very effectively in Portugal and I've used in Kenya to trap African Crake *Crex egregia* and Greater Painted Snipe *Rostratula benghalensis* (it also works very nicely for Sharpe's Longclaw *Macronyx sharpei* in windswept montane grassland habitats) and were amazing to handle.

One of the best moments, however, was as we were nearing the end of clearing the nets of swallows at the second swallow roost. We'd put up a couple of nets in the evening in the reeds and played Barn Swallow song underneath it and caught a total of 148 birds including half a dozen or so Sand Martins *Riparia riparia*. It was dark by the time we were extracting the last 20 or so birds and it was then I noticed a bird in the middle of the top panel – i.e. not in the pocket but 'stuck' to the flat wall of netting a few inches below the top shelf string. 'Probably caught by a ring' I said to Mark next to me half-jokingly, so reached for it next as it was fluttering around held only by the left foot . . . but sure enough there *was* a ring snagged on the netting and in the torchlight we made out 'BUDAPEST T103689' – YES! Our first control and a mega exciting moment! The joys of modern communication and e-mail meant that we were able to discover the ring-

ing details before the end of the fortnight: Izsák, Hungary in mid-August 1999 as a first year swallow and therefore on its second return journey from Africa.

That wasn't all . . . and the other controls (note the plural!) were almost more extraordinary in that we had no more until the very last morning, and even then the very last two hours of ringing! The first was a Eurasian Reed Warbler from the single panels with a ring that read 'Tel Aviv . . .' and that same round from a line of nets in the reeds a Moustached Warbler with another 'Tel Aviv' ring . . . followed an hour later from the same net ride by *another* Moustached Warbler with yet *again* a 'Tel Aviv' ring!! This had been the predicted origin of most of the controls we expected to catch, but even so . . . THREE in two hours of ringing and 172 ringed birds that day was just ridiculous!

When it was quiet around the nets, being in the middle of the Bekaa Valley meant that we were perfectly positioned to see any larger migrants passing overhead, and sure enough on some days we had some awesome spectacles of visible migration. White Storks *Ciconia ciconia* were the most numerous but there were two or three flocks of 40–60 Black Stork *Ciconia nigra* and a single huge flock of *c.* 900 White Pelican *Pelecanus onocrotalus* in V-formation that cruised past overhead making an incredible sound through the air with their wings. Several flocks of Common Cranes *Grus grus* were also seen and there was an almost constant movement of raptors with sometimes 20–30 Lesser Spotted Eagles *Aquila pomerina* in the air together with several Longlegged Buzzards *Buteo rufinus*, Steppe Buzzards *Buteo buteo* or Black Kites *Milvus migrans* amongst them. Longleggeds were in fact permanently around the fields and marsh the whole two weeks in ones and twos and we also had all four species of harrier – Eurasian Marsh *Circus aeruginosus*, Hen *C. cyaneus*, Pallid *C. macrourus*, and Montagu's *C. pygargus* – including beautifully plumaged males. Other ornithological highlights were Blackcrowned Night Heron *Nycticorax nycticorax* at night in the marsh as we drove back from a swallow roost, a Bittern *Botaurus stellaris* and Collared Flycatcher *Muscicapa albicollis* – the latter two being birds I have been looking for for a long time (the flycatcher was caught and ringed on the mountain site, but on one of the days when I was working the marsh so I dipped on that one in the hand!).

There is unlimited potential for some really fascinating studies on migrants passing through the northern stretches of the Rift Valley and the little-known resident species in Lebanon, something that the A Rocha Lebanon project is planning to carry out including regular constant effort ringing on the Aammiq Marsh and in the oak woodlands on the mountain side. The ringing there is truly superb – conditions can seem a bit extreme for a tropical ringer used to warm water (one of the net rides involved 'swimming' – i.e. wading up to your armpits in freeeeezing water! Though we managed to reduce it to just waist high, but still . . . !) and NOT used to frost on the ground (I don't recommend open sandals at dawn . . .), but the quality of the ringing easily makes up for that! Imagine it: down on the marsh at dawn with the sun rising over crystal clear hills and with Mt Hermon iced with snow as a backdrop, a Little Crake in the hand and 30+ migrant *Acrocephalus* warblers and the odd Penduline Tit *Remiz pendulinus* in bags waiting to be ringed, Longlegged Buzzards and flocks of 500–800 White Storks overhead . . . with back-up support of tea and freshly-baked scones with strawberry jam and thick layer of cream as mid-ringing morning snack . . . what more could a ringer ask for?!

Furthermore, it was a really fascinating country to visit and the Lebanese people we met were very friendly – and the food . . . well, it was incredible! At present, the A Rocha Lebanon team don't plan to run further ringing weeks for visiting ringers due to staff changes, but there will be some regular ringing being carried out on constant effort sites – so DO keep a look out for any birds that turn up in your nets wearing a bangle labelled 'LIBAN ****'!

Movements and timing of moult and breeding of the Cape White-eye *Zosterops pallidus* in KwaZulu-Natal

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Introduction

Over a 50 year period the Cape White-eye *Zosterops pallidus* was the 13th most common bird species ringed in southern Africa (Oschadleus & Underhill 1999). If not for specifically targeted species like European Swallow *Hirundo rustica*, African Penguin *Spheniscus demersus* and Redbilled Quelea *Quelea quelea*, it would possibly rate higher up the list. The Cape White-eye is common in KwaZulu-Natal (KZN) (Maclean 1994; Nuttall 1997), yet little is documented on the timing of breeding, moult and movements in the region. This summary of ringing efforts by the authors reports recaptures and timing of breeding and moult in the Cape White-eye in KwaZulu-Natal accumulated over a seven year period (1994–2001). Recaptures are reported and discussed.

Methods

Cape White-eyes were trapped using mist nets (12 m × 2.4 m; 16 mm mesh) supplied by SAFRING and ringed by registered ringers of the University of Natal, Pietermaritzburg. No ringing sessions targeted capture of Cape White-eyes. Primary moult score was recorded (De Beer *et al.* 2000). Active breeding was determined by the presence of a distinct brood patch on individual birds. Ringing occurred at 22 different sites (Table 1). All data were accumulated for each month.

Results

Most captures occurred at two Afromontane forest ringing sites in the KwaZulu-Natal midlands, i.e. Hlabeni and Ngele forests (Table 1; see Symes *et al.* in press for site details and bird species lists).

Moult and breeding

Occurrence of moult is indicated by the proportion of caught birds each month undergoing active moult of the remiges. Occurrence of breeding is represented by the proportion of caught birds with an distinct brood patch. This was used as evidence of breeding in the region (Fig. 1). Frequency of breeding as

Table 1. Cape White-eye ringing sites in KwaZulu-Natal showing habitat type, and number of captures and recaptures at each site

Locality	Habitat	Caught	Recap
High Birnham Farm, Merrivale Heights	protea patch	97	17
Hlabeni Mountain, Creighton	protea patch & forest	122	7
Ngele Forest, Weza	forest	72	3
Pietermaritzburg (9 sites within city surrounds)	gardens & proteas	47	7
Other southern KZN (4 sites)	garden, protea & bushveld	42	1
Other south central KZN (4 sites)	protea, bushveld & forest	23	0
Sani Pass & Top Lodge, Drakensberg	garden & proteas	5	0
Total		**408**	**35 (8.6%)**

indicated by nest record cards is also shown (n = 185) (LePage 1999).

Recapture rate and movements

A total of 408 Cape White-eyes were caught and twenty-six individuals were recaptured (Tables 1, 2). Seven were recaptured twice and one was recaptured three times (Table 2). The highest recapture rate (17.5 %) was at a *Protea* farm near Merrivale (Table 2), although the greatest ringing effort was not here.

Discussion

In many temperate zone species the timing of moult in relation to breeding may be mutually exclusive (Dwight 1900; Maclean 1990). However, in some species wing moult may occur during breeding (Craig 1983; Jenni & Winkler 1994). Also, interrupted moult may occur, yet in southern African birds this moult strategy is still unclear (Craig 1983).

The results of this study indicate that breeding of the Cape White-eye in KwaZulu-Natal, although skewed by the small sample size of July, is most prevalent in December and January. However, this is contrary to nest record card data where breeding is indicated as most common from September to December, peaking in October (Lepage 1999; Fig. 1). Maclean (1994) indicates breeding of the Cape White-eye as occurring from July to March in KwaZulu-Natal, and mostly from October to December throughout the country. Nuttall (1997) indicates breeding as occurring from August to March, peaking in December. In winter rainfall regions a breeding peak is realized earlier in November (Nuttall

Table 2. Recapture of Cape White-eye's reporting capture site and number of days since first ringed. * recaptured in Ladysmith, KZN.

Retrap	Location	1st recap	2nd recap	3rd recap
AD85104	22 Petrea Ave., Cleland, Pmb	83	118	
AD85102	22 Petrea Ave., Cleland, Pmb	118		
AD90935	68 New England Rd, Scottsville, Pmb	125		
AD85289	68 New England Rd, Scottsville, Pmb	78		
AD29431	High Birnham Farm, Merrivale Heights	84		
AD85235	High Birnham Farm, Merrivale Heights	57		
AD93576	High Birnham Farm, Merrivale Heights	33		
AD93577	High Birnham Farm, Merrivale Heights	33		
AE18445	High Birnham Farm, Merrivale Heights	378	498	
AE18446	High Birnham Farm, Merrivale Heights	414		
AE18451	High Birnham Farm, Merrivale Heights	378	404	414
AE18608	High Birnham Farm, Merrivale Heights	36		
AE18631	High Birnham Farm, Merrivale Heights	10	33	
AE18957	High Birnham Farm, Merrivale Heights	10		
AE18664	High Birnham Farm, Merrivale Heights	93		
AD29431	High Birnham Farm, Merrivale Heights	1265	1349	
AD90968	Hlabeni Forest, Creighton	484	1579	
AD90970	Hlabeni Forest, Creighton	484	1579	
AD85252	Hlabeni Forest, Creighton	763		
AE18659	Hlabeni Forest, Creighton	65	171	
AD85256	Ngele Forest, Weza	334		
AD85121	Ngele Forest, Weza	276		
AD85256	Ngele Forest, Weza	1250		
AE18332	SAFCOL Forestry Offices, Weza	510		
AE18680	3 Lincoln Mews, Hayfields	254		
GA05926	3 Lincoln Mews, Hayfields	117*		

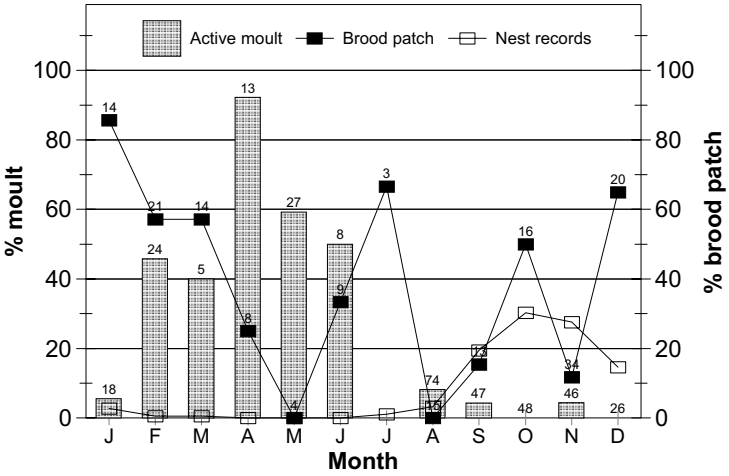

Fig. 1. Occurrence of breeding and moult in the Cape White-eye as expressed by the percentage of birds caught each month with moulting remiges and displaying a brood patch respectively. Breeding is also indicated by fraction of records in which breeding was recorded (LePage 1999).

1997). Cyrus & Robson (1980) indicate breeding as occurring from September to March, but also note breeding as occurring in July. In light of these data it is clear that further investigative work on the breeding of this species is required. Analyses of additional ringing data by region may provide greater insight into breeding seasons of the Cape White-eye on a regional scale.

The occurrence of primary moult in the Cape White-eye in KwaZulu-Natal is predominantly from February to June, with a peak in April. This suggests that the occurrence of moult directly follows the annual breeding cycle. This moult is in agreement with that of Earle (1981) who recorded a postnuptial moult of remiges between February and June. However, in the Eastern Cape moult in 27 specimens was in all months except March (Craig 1983). It is likely that interspecific variation between different regions exists in the timing of moult and breeding in this widespread species.

In some families (e.g. Alaudidae, Paridae, Pycnonotidae) a partial post-juvenile moult appears to be the rule (Craig 1983). Detailed information collected and published by ringers may help us to understand some of the underlying principles in the moult patterns of this species.

Local and/or altitudinal migrations have been suggested in the Cape White-eye (Clancey 1964; Johnson & Maclean 1994). Seasonal movements may occur to some extent with birds remaining faithful to an area when breeding (Nuttall 1997). Strong site and flock fidelity are supported by the recapture of two birds (likely a pair) at Hlabeni 484 and 1579 days later. This may indicate some level of monogamy in a species regularly occurring in flocks. In the Cape White-eye, DNA analyses indicate that flocks form cohesive groups with little gene exchange between populations (Brown *et al.* 2000).

Long distance movements of Cape White-eyes are not commonly known. Most SAFRING recoveries reveal Cape White-eyes as being sedentary (Nuttall 1997). Only three recoveries of greater than 100 km have been recorded (SAFRING). These include a

10 year old bird recovered in Free State Province, 405 km from the ringing site in KwaZulu-Natal, another movement of 164 km, and the individual in this study recovered 117 days after moving a distance of 135 km (SAFRING). The fourth greatest distance is only 31 km. These movements may not be regular as indicated by few long distance movement records for a species where a high number of species have been ringed. The reason for these movements is not known and may simply be random wandering movements. Further research into the movements of the Cape White-eye are therefore required.

Acknowledgements

Numerous field assistants and undergraduate students are thanked for assistance in the field.

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Electronic schedules

In the 2000 ringing year 93 ringers sent 41 892 ringing records electronically to date. Paper schedules accounted for 29 778 records submitted by 38 ringers. While a high percentage of ringers (71%) submitted electronic schedules, their proportion of ringing records is much lower at 58%. Clearly some of the most prolific ringers submitted paper schedules.

It is very encouraging to see that the numbers of ringers and records are increasing annually. Keep it up!

Blackcheeked Lovebirds in the hand

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Most parrot species do not lend themselves easily, or indeed painlessly, to bird ringing. Lovebirds, however, by virtue of their relatively small size, dependence on water and largely terrestrial foraging habits are somewhat softer targets – so soft in fact that none of us have a lasting scar to show for the experience! Few lovebirds have previously been caught with the intention of collecting ringing records, and the current SAFRING database is almost void of any lovebird records.

In 1998 I began two and a half years of fieldwork in south-west Zambia researching the basic ecology of the Blackcheeked Lovebird *Agapornis nigrigenis*, continuing the status and distribution work of Tim Dodman and team (Ostrich 71: 228–234). Tim has the honour of being the first person to ring Blackcheeked Lovebirds, catching seven birds between 30/11/94 and 01/12/94.

Zambian ringer Pete Leonard and Kate Knox kindly interrupted their holiday in the Nanzhila region of Kafue National Park to assist with the initial ringing portion of my study. On the afternoon of the 24/10/98 we erected nets around a pool with a total circumference of 64 metres. The pool was 225 metres from the lovebird's assembly tree, a tall *Acacia polyacantha*, and 15 metres from their pre-drinking perching trees. Prior to this, my field assistant, Debbie Smy and I had carefully observed various lovebird preferred drinking sites to get a clear idea of arrival patterns (timing and direction), perching positions (assembly tree and pre-drinking), drinking spot preferences, size of lovebird flocks and utilisation of the pool by other species (the large furries and huge flocks of Redbilled Quelea *Quelea quelea* were best avoided!). October is known as the 'suicide month' in the Zambezi Valley for good reason. It's very hot and dry, forcing increasing numbers of lovebirds to flock to the last remaining pools of surface water.

The timing of lovebird arrivals to the assembly tree, first drink and departure from the area were remarkably constant and predictable, allowing us to set up the nets and sit back to await the first lovebird arrivals on cue. One of our major problems was trying to prevent the quelea from getting caught in the

Adult Blackcheeked Lovebird.

Table 1. Measurements of Black-cheeked Lovebird (includes data of Tim Dodman's team).

	n	Mean	Range
Mass	28	38.8 g	35–46 g
Wing length	28	98.0 mm	91–103 mm
Tail length	21	44.1 mm	42.25–45.5 mm
Tarsus length	25	14.2 mm	12.8–14.8 mm
Culmen length	25	15.4 mm	15.5–16.5 mm
Culmen width	28	9.5 mm	8.5–10.4 mm

nets before the lovebirds. Prior to drinking the quelea assemble in the bushes close to the pool and go down to the water before the lovebirds. Our quelea deflection strategy was to have Pete jump out from under one of the bushes just before the quelea went down to drink to temporarily scare them away.

On our first attempt we caught 6 lovebirds and 14 more the following morning. As we extracted the birds the nets were closed given the slightly lengthy extraction and processing times. Some lovebirds managed to avoid the nets by flying over them and landing inside the edges of the pool. The birds netted on our first attempt were kept overnight as their flock-mates disappeared to their roost-sites soon after drinking. The captured birds remained quiet and settled. The following morning prior to the first lovebird arrival at 05h40 the nets were unfurled and Pete crawled under the quelea bush. The previous evenings captives were hung in the shade of the assembly tree, to be released once the nets had been emptied to avoid recapture. By 05h53 47 lovebirds had been counted flying into the assembly tree. As more lovebirds flew in, the captive birds started to respond by returning calls. I wondered whether they recognised individual calls of arriving flock-mates as they had remained silent until this point. At 06h14 the first lovebirds went down to drink. A few birds were netted immediately although a large number bounced straight out of the nets. The majority continued trying to reach the water, with a few even perching on the guy ropes!

Once in the net, the (14) lovebirds remained quiet, although they screeched loudly while being extracted. Other species caught included: Lilacbreasted Roller (*Coracias caudata*), Southern Greyheaded Sparrow (*Passer diffusus*), Common Waxbill (*Estrilda astrild*), Blue Waxbill (*Uraeginthus angolensis*), Redbilled Firefinch (*Lagonostica senegala*), Yelloweyed Canary (*Serinus mozambicus*), Greater Blue-eared Starling (*Lamprotornis chalybaeus*), Cape Turtle Dove (*Streptopelia capicola*), Blackeyed Bulbul (*Pycnonotus barbatus*) and Redbilled Quelea. As soon as the nets were closed the previous evenings captives were released, and flew straight into the assembly tree where the rest of the lovebirds had retreated to and were calling noisily from. In follow-up visits several days later the same number of lovebirds were still using the pool.

On 04/11/98, in the company of ringer Lauren Gilson, three nets were set up at the same pool. Unfortunately this time the deflection of large flocks of quelea and waxbills was not so successful, and disturbed the approaching lovebirds, the majority of whom circuited the pool, and only one was caught. By 07/11/98 the rains had sufficiently set in to fill the pans in the Mopane woodlands allowing the lovebirds to disperse over a wide area to drink.

With hindsight the optimum ringing time would have been from the beginning of September through October, although predictable lovebird flocks were observed at pans from mid-July onwards. 'C' overlap rings were supplied by the Zambian Ornithological Society with the recovery address being Livingstone Museum. I personally feel that it is highly unlikely that lovebirds can be netted away from drinking sites, although the use of 'decoy' birds, or perhaps sound-recording might lure the birds into a specific area. It may also be possible to trap birds during the crop-ripening of millet and sorghum, although the use of nets in front of local villagers would be a highly foolish act in terms of lovebird conservation.

Most lovebirds showed some body moult, and a few had moulted tail coverts. The

Juvenile Blackcheeked Lovebird.

majority of tails displayed some form of abrasion, a feature generally expected in cavity roosters. Iris colour ranged from pale to dark brown. Juvenile birds have a dark iris, although all birds caught were presumed to be at least seven months old. Measurements were taken (Table 1, includes Dodman data). Other measurements taken, but not shown here, include: tarsus width, beak (cere-tip), hind-claw, colour definition on head and nape and signs of sexual activity.

Between February and April 2000 the lovebirds were observed breeding and first records of breeding behaviour in the wild were collected. During this period my field assistants were Darryl Birch and Frankie Hobro from the Mauritius Wildlife Foundation, who brought invaluable experience from the Echo Parakeet project with them. Although 78 nests were found, and 64 climbed up to cavity height, only 5 nests had large enough cavity entrances allowing human access to the nests. Eighteen chicks were briefly removed and measured, photographed and blood sampled. Seven of the larger chicks (lovebirds are asynchronous) were ringed. While re-measuring the one clutch five days later, it was noticed that the leg area around the ring looked slightly red. The ring was probably exerting some pressure on the tarsus since the chick was inactive in the nest. We removed all but one ring (that chick subsequently fledged). I would therefore like to suggest that rings are not fitted onto unfledged lovebirds, although this is standard practice with captive birds. The chicks did not appear stressed by the handling, and adult birds resumed parental duties almost immediately. We did however feel that after the second handling the older near-fledged chicks were less relaxed, and would like to recommend that in future projects lovebird chicks are only removed from the nest for measurements once.

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The successful release of wild-caught birds used in laboratory experiments

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Researchers on occasion bring wild caught birds into the laboratory to be used in various studies. Some of these studies may be non-invasive (Downs 2000; Symes & Downs 2001; Downs & Brookes in prep.) while others use invasive techniques to examine various aspects of bird physiology (Downs & Brown in press). Once the research is completed, birds are either released or euthanased.

Euthanasia has been recognised as drawing more and more public attention, and should only be used as a last alternative (Beaver *et al.* 2001). Releasing the birds at the site of capture is obviously the preferred option, but very little data exists on the success of these releases and the integration of these birds back into the natural populations from where they came.

Other problems with releasing captive held birds include the possibility of introducing diseases into wild populations, territoriality disputes, timing of release with respect to the local movement patterns of the species, food availability, and others.

Lotz & Underhill (1998) recorded a single recapture of a Lesser Doublecollared Sunbird *Nectarina chalybea* held in captivity for a year. The bird was recaptured 3 months later and had travelled a distance of 25 km. They were uncertain as to the exact capture site of each of the13 birds released, so all birds were released at a single site. Their record is significant as it seems to be the first report of a laboratory held bird successfully being released in South Africa.

Over the course of the last seven years, various species of birds have been brought into the Animal House at the School of Botany and Zoology, University of Natal. All birds have been housed under permit of the KwaZulu-Natal Wildlife Services. All experimental protocols were approved by the Animal Ethics sub-committee of the University of Natal.

Between December 1993 and June 1996, various species of Sunbirds (Malachites *Nectarina famosa*, Whitebellied *Nectarina tala-*

Table 1. Details of re-sightings of laboratory housed birds released back into the wild.

Ring number	Species	Date ringed	No. of sightings	Most recent sighting	Time lapsed	Distance (km)
CV06775	Gurney's Sugarbird	12 Sep 1994	2	2 May 1995	0y 7m 20d	0
4A07225	Speckled Mousebird	24 May 1997	1*	25 Oct 1997	0y 5m 1d	2
GA05926	Cape White-eye	23 Aug 2000	1*	18 Dec 2000	0y 3m 26d	135
GA05942	Cape White-eye	25 Aug 2000	8	27 Dec 2000	0y 4m 3d	0
GA05931	Cape White-eye	24 Aug 2000	2	11 Nov 2000	0y 2m 18d	0
GA05937	Cape White-eye	24 Aug 2000	1	13 Sep 2000	0y 0m 20d	0
GA05940	Cape White-eye	24 Aug 2000	1	22 Sep 2000	0y 0m 29d	0
GA05941	Cape White-eye	24 Aug 2000	1	22 Sep 2000	0y 0m 29d	0

* denotes a bird recovered

tala, Black *Nectarina amethystina*), and Gurney's Sugarbirds *Promerops gurneyi* were utilised in experiments examining the nectar preferences of southern African Sunbirds (Downs 1997; Downs 2000; Mbatha & Downs in press). In total, 13 sunbirds and 2 sugarbirds were released after being held for up to eight months. Twenty-one Bronze Mannikins *Spermestes cululatus* were released in May 1995 after being held for a few months. In 1997 nine Speckled Mousebirds *Colius striatus* were released after being held for six months in a study of fruit size preference, feeding method, energy intake and handling time (Symes & Downs 2001). During the summer of 1999/2000, six male Malachite Sunbirds were housed in a study of thermal biology. Mini-transmitters were surgically-inserted and later removed (Downs & Brown in press; Downs in press). During 2000, 20 Cape White-eyes *Zosterops pallidus* were housed for a study of food preference, digestive efficiency and handling times (Downs & Brookes in prep).

All birds were released, mostly at their capture site, upon completion of the studies. Six of the Cape White-eyes were colour ringed upon release in order to facilitate sightings at the release site. Eight birds of various species were resighted and/or recovered after release (Table 1).

The first record of a released bird's success was Gurney's Sugarbird CV06775 which was resighted over 7 months after release at the site of release. This bird had been held in captivity for 8 months and 1 day. The bird was seen at the site of release and was in good health. Speckled Mousebird 4A07225 was released 2 km away from the site of capture, yet was recovered in the yard next door to the site of capture 5 months and 1 day after release. The most interesting recovery so far is that of Cape White-eye GA05926 which was released at the site of capture in Pietermaritzburg. This bird was recovered 3 months and 26 days later in Ladysmith, a direct distance of 135 km. This is to date the 3rd furthest movement recorded for the species (SAFRING).

A total of 73 birds of eight species have been released since 1994. Of these, 11% have so far been sighted or recovered. The monitoring of two sites where eight Cape White-eyes were released yielded resightings on six of these birds, ranging from 20 days to over 4 months. We feel this very high percentage, along with the excellent condition of most of the birds, justifies the release of birds utilised in laboratory experiments. We recommend more researchers release birds when studies are complete, and suggest that some sort of follow up is needed to assess the re-integration of these birds into the natural populations.

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Forest bird longevities in NW Tanzania

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Introduction

During July and August 2000, we undertook a survey of the birds of the Minziro Forest (01°06'S, 31°30'E) as part of the East African Crossborders Biodiversity Project. The Project aims to reduce biodiversity loss at specific cross-border sites in Kenya, Uganda and Tanzania. The forested area straddles the northern border of Tanzania and extends into Uganda, where it is known as the Malabigambo Forest. Minziro Forest Reserve is 24 841 ha; an estimated 19 000 ha is closed forest with the remainder being composed of *Acacia polyacantha* woodland and seasonally flooded grassland (Baker 2001). The avifauna of this forest is dominated by lowland equatorial rain forest species of West African affinity, many of which are not known to occur elsewhere in Tanzania (Baker & Hirslund 1987; Baker & Baker 1994).

In 1984, Neil Baker and Per Hirslund made a short visit to Minziro Forest Reserve and added seven species to the Tanzanian list. In 1987, Neil and Liz Baker led a team of 8 ringers and observers to further investigate the birds of this poorly known forest reserve anticipating that more additions to the Tanzania list would be found there. This proved to be the case, and 14 more species were added, most of which were captured in mist nets (Baker unpubl.). A total of 427 birds of 67 species were ringed in a net line maintained for 18 days. A third expedition in November–December 1993 to a different part of the forest (approximately 4 km from the 1987 site) ringed a further 384 birds of 51 species.

The purpose of the July 2000 survey was to update the ornithological inventory, to check for the presence of species known to occur on the Ugandan side of the border but hitherto unrecorded from Tanzania, and hopefully to retrap some individuals ringed in 1987. All three objectives were achieved and this note serves to place on record the retraps that came to hand.

Methods and survey period

A netline of 250 m was set up along the exact same footpath used in the 1987 survey. Nets remained in position from initial erection on 24–25 July to noon on 3 August. A further 18 m of nets were erected on 27 July and remained in place until 3 August. Lower shelves of nets were lifted at dusk (high enough to allow Bushbuck *Tragelaphus scriptus* to walk underneath) and dropped again at dawn. No birds were caught in the open upper shelves between dusk and dawn, and the only nocturnal capture was a single bat, caught just before dawn. Nairobi-address rings supplied by the East African Natural History Society were used in all three surveys.

Results and discussion

A total of 363 birds of 58 species were caught and ringed. An additional seven birds of six species bearing rings from the 1987 survey were retrapped; the elapsed times exceed longevity records published by Fry *et al.* (1988) and Keith *et al.* (1992) for five of the six species (Table 1). No birds were caught from the 1993 survey. The retrap dates were randomly distributed through the survey period and it is improbable that all the 1987-ringed individuals still alive in July–August 2000 were retrapped. Had the netting period been extended by days or weeks, it is likely that proportionately more retraps would have come to hand.

All of the retrapped birds were aged as

Table 1. Birds ringed in Minziro Forest in July 1987 and retrapped in July–August 2000. Previous longevities are those published in Birds of Africa Vols 3 & 4 (Fry *et al.* 1988 and Keith *et al.* 1992).

Species	Ring number	Date of ringing & time	Recapture date & time	Body mass (g) 1987 & 2000	Elapsed time	Number ringed in 1987 & 2000	Previous longevity
RufousThrush *Stizorina fraseri*	A40881	10-07-87 at 11:00	27-07-2000 at 12:15	34.3 & 36.3	13y0m17d	6 & 3	8y
Firecrested Alethe *Alethe diademata*	A40796	14-07-87 at 08:00	27-07-2000 at 18:00	31.9 & 34.0	13y0m13d	14 & 34	8y
Little Greenbul *Andropadus virens*	J187930	11-07-87 at 09:00	28/07/2000 at 17:00	28.5 & 25.3	13y 0m17d	10 & 7	7y 9m
Cameroon Sombre Greenbul *Andropadus curvirostris*	J187925	09-07-87 at 18:00	29-07-2000 at 15:00	27.0 & 25.0	13y0m20d	12 & 11	19y 6m
Greentailed Bristlebill *Bleda eximia*	A35188	06-07-87 at 07:00	29-07-2000 at 18:30	38.1 & 40.5	13y0m23d	17 & 11	10y
Greentailed Bristlebill *Bleda eximia*	A40760	08-07-87 at 09:00	30-07-2000 at 09:40	36.0 & 39.0	13y0m22d	17&11	10y
Brown Illadopsis *Illadopsis fulvescens*	J187955	14-07-87 at -	02-08-2000 at 07:30	27.0 & 28.5	13y0m19d	4* & 7	3y 3m

*An additional 12 unassigned (to species) Illadopsis individuals were ringed in 1987

adults when originally ringed in 1987. This means that they must then have all been in their second year of life (at least) and certainly not less than 15 months old (the age at which forest passerines such as these complete their first full moult). Not one of these seven individuals was therefore less than 14 years of age when retrapped.

It is noteworthy that the number of 1987-ringed birds of each species at risk of retrap in Minziro Forest was comparatively small (Table 1). The statistical probability of recapture of even one bird after a lapse of 13 years from such small sample of ringed individuals would be infinitesimal if the relevant species were not naturally long-lived. In Britain, for example, it was necessary to ring 777 074 Great Tits *Parus major* before an individual of similar age (13.9 years) was recovered (Mead & Clark 1991). These Minziro retraps, in addition to establishing new longevities for six species, further supplement the growing body of evidence for superior survival rates in many African passerines (Peach *et al.* 2001).

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A technique to catch free-flying flamingos (or the saga of how I tried)

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While talking to Rob Simmons in early 1998 about all the flamingos present on the Ekuma River in Etosha National Park he mentioned that it was very difficult to catch free-flying flamingos and only a handful had been caught using foot nooses. Rob was interested in ringing Etosha birds to see whether or not there was interchange between various population centers. Some ringed and patagially tagged birds from Etosha have been seen at Walvis Bay and one Lesser Flamingo *Phoenicopterus minor* was recovered at Ghanzi, Botswana but it is not known if Etosha, Walvis Bay or Sandwich Harbor birds go to Sua Pan, Botswana.

A variety of techniques have been tried to catch adult flamingos but the success rate has required maximum effort for minimal results. Natives catching the birds for food in the Caribbean islands have stripped naked, coated themselves with white clay and then stealthily belly-crawled up on the birds when their heads are below the water feeding (Allen 1956). Others have noted that foot nooses made from string or nylon and laid out in the water have been used by Africans at Lake Natron in Tanzania to catch the birds. Adapting the foot noose technique in Kenya, Brooks Childress (pers. comm.) caught 35 Lesser Flamingos in Lake Bogoria. In Botswana Graham McCulloch (R. Simmons pers. comm.) caught 29 Lesser Flamingos and 3 Greater Flamingos *Phoenicopterus ruber* using the foot noose technique over a 2–3 week period, checking the nooses both day and night. Flightless chicks have been caught for ringing purposes all over the world, and cannon nets have been used in the Orange Free State (Johnson 1986) but have the potential to harm such long-necked birds.

Since we had been very successful catching Kori Bustards *Ardeotis kori* with a gillnet, my wife Laurel and I took Rob's quest as a challenge for us to try and catch flamingos using the same net. The net we use for the kori is a monofilament gillnet hung flag style (only a 3 mm top line) as a special order from the Nylon Net Company, Memphis, Tennessee, USA (www.nylonnet.com). The net is 300 feet (90 m) long by 10 feet (3 m) deep with 8 inch (20 cm) square mesh using #208 monofilament (0.52 mm) with a 26 pound (12 kg) breaking strength. The monofilament is whitish. We dyed the net a golden brown using 2 packets of regular clothing dye but leaving the net in the dye overnight for better penetration of the monofilament. Since we use the net flag style for the bustard we modified the net with an addition of a 3 mm bottom line threaded through the lowest webbing. We tied the top of the net to a 4 m long thick-walled (3 mm) aluminum pole which was guyed with 5 mm nylon ropes tied to 1 m x 20 mm steel pipes driven into the ground. By stretching the net tight enough we were able to keep the sag in the middle high enough so the bottom edge of the net cleared the water. The bottom line was stretched tight and tied to the base of the poles. The end result is a giant one-shelf mist net.

We first tried the net over the Ekuma River (the northern feeder river to the Etosha Pan) between 19h00–23h00 on 23 April 1998. The river was about 0.6 m deep and 40 m across so we only used a portion of the net, leaving the rest coiled up at the base of one pole. After dark we caught four Lesser and one Greater Flamingo and one Cape Teal *Anas capensis*. The next morning we found one Greater Flamingo in the net but standing on the river bottom. Rob was concerned that the nets might break the birds' legs or necks

Table 1. Measurements of Greater Flamingos captured in Namibia.

Ring number	Date	Age	Weight (g)	Wing (mm)	Culmen (mm)	Tarsus (mm)	Notes
856682*	26-07-97	Juv.	1000	299			still flightless, caught by hand
856683*	26-07-97	Juv.	940	224			still flightless, caught by hand
856678	24-04-98	adult	2120	360			
none	24-04-98	imm					leg broken by gunshot, released unringed
856680	19-11-98	imm	2298	380	111		
none	19-11-98	imm					old break on leg, released unringed
none	20-11-98	adult					killed by jackal
9A08204	12-08-99	adult	2495	376	132	290	
9A08205	12-08-99	adult	2755	380	121	254	
9A08206	12-08-99	adult	2778	372	125	284	
9A08407	12-08-99	adult	2720	395	122	248	
9A08408	12-08-99	adult	2660	403	123	283	
9A08209	30-11-99	adult	2280	315		255	
9A08210	30-11-99	adult	2960	410		265	
9A08211	30-11-99	adult	2560	372		253	
9A08212	30-11-99	adult	3240	415		335	

* These birds were not caught with the gillnet.

but the impact is cushioned by the size of the net. We did, however, catch birds with legs already broken by shotgun pellets. The moon did not rise until early in the morning. We informed Rob of our success but he wanted to know if the technique would work in an open situation like Walvis Bay or Sandwich Harbour. He invited us to join him at Sandwich Harbour on 2 November.

Before November I returned to America and ordered another kori net but with special modifications for flamingos. The net was the same length but I ordered it 4 m deep with 15 cm square mesh and I did not dye the net. We set up the net over a small tidal inlet and waited for birds to fly in. During the day the birds would fly up to the net and veer over the net after seeing it. The moon was full that night and I checked the net every 3 hours. Finally at 04h30, near high tide, one immature Lesser Flamingo was in the net. I woke Rob by letting the bird nibble on his nose to prove my success. We also caught a Curlew Sandpiper *Calidris ferruginea*. Occasionally when I awoke to check the net I could see flamingos flying up and down the inlet but when they saw the net they veered away from it. The next night we caught only an Avocet *Recurvirostra avosetta* and a Whitefronted Plover *Charadrius marginatus*. The capture of the sandpiper and plover was surprising considering the size of the mesh!

Slowly I was beginning to get an idea of the conditions which I needed to utilize the net successfully. We needed a dark night (new moon) with an incoming tide. We decided to have another try near the next new moon. On 19 November, three days after the new moon, we set up the net at the Walvis Bay salt works. At the first dehydration pond thousands of Lesser Flamingos feed and thousands of Greater Flamingos roost during the high tides when they are pushed off Walvis Bay. We had dyed the net brown in the interim. We set up 2 nets, one parallel to and on the water's edge and the other on top of the pond dike near where the water was being pumped into the pond. The nets were out

Table 2. Measurements of Lesser Flamingos from Namibia.

Ring number	Date	Age	Weight (g)	Wing (mm)	Culmen (mm)	Tarsus (mm)
856674	23-04-98	adult	1400	345		
856675	23-04-98	imm	1360	335		
856676	23-04-98	imm	980	311		
856677	23-04-98	imm	1040	305		
856685	12-08-99	adult	1770	331	110	224
856686	29-11-99	adult	2100	349		245
856687	29-11-99	imm	2000	350		197
856688	30-11-99	adult	2080	355		224
856689	30-11-99	adult	1240	295		178
856690	30-11-99	adult	1460	316		199
801551	30-11-99	adult	1690	332		197

from 19h00–23h00 and we caught 2 Greater Flamingo along with Swift Tern *Sterna bergii*, Kelp Gull *Larus dominicanus*, Hartlaub's Gull *Larus hartlaubii*, Cape Teal, Avocet and Arctic Tern *Sterna paradisaea*. The next night was a disaster with the first two birds, a Greater Flamingo and Swift Tern, both killed by a Blackbacked Jackal *Canis mesomelas* before we could get to the net. The rest of the night was spent chasing off the jackals and we ended up catching a Hartlaub's Gull, an African Black Oystercatcher *Haematopus moquini*, an Eastern White Pelican *Pelecanus onocrotalus* and a jackal who was busy chewing up the net one metre away from the pelican.

My next attempt was on 11 August 1999 during the new moon but with a high tide at 15h29 so night would fall while the tide was falling. I did, however, add a new twist to the setting of the net. We placed the net about 50 m out in the water, where it was about 0.5 m deep, to discourage jackals. I also placed 6 life-sized plastic lawn flamingos ('Realmingo™' Union Products Inc., Leominster MA 01453, USA) near the center of the net. The hope was that flamingos flying to roost at the salt pan would fly low 1–2 m above the mud flats then rise up to clear the pond dike and drop back low again and try to land where they saw other flamingos (our decoys). The first night we were still setting up the net as the first birds came in and our catch was nil. On 12 August we caught one Lesser Flamingo, five Greater Flamingo and five Greenshanks *Tringa nebularia*.

Checking the moon and tide cycles I decided that the next good time (new moon, high tide 20h47) to test all my theories was 29 November. Again I set a single net with the decoy flamingos and between 19h00–00h30 we caught two Lesser Flamingo, ten Hartlaub's Gulls, three Bartailed Godwits *Limosa lapponica*, one Swift Tern, and one Avocet. The next night we caught five Lesser Flamingo, four Greater Flamingo, one Black Oystercatcher, one Bartailed Godwit, one Avocet, three Black Terns *Chlidonias niger* and 24 Hartlaub's Gulls. We had planned to call it an early night and checked the net for the last time at 21h00 but it was full of gulls, etc. so we worked until 02h30.

In conclusion, after much trial and error, the technique worked on nine evenings totalling 53 hours to catch 13 Lesser and 14 Greater free-flying flamingos; provided that the moon is set or new, the tides are incoming to force the birds to their roosts, the net is placed over the water and set up before dark and decoys are used.

The net costs US$300 without any shipping charges so the price might be a bit high for the casual ringer. When ordering nets, if you plan on using 4 m-high net poles, order a net 4 m deep. The nature of the monofilament strands causes the netting to curl, espe-

Fig. 1. Plastic flamingo decoys. (Holder is Gunther Friederich.)

cially if it is stuffed into a sack for transportation, and the working depth will be about ⅓ less.

I purchased a net for R. Simmons but he did not try it under all the caveats listed above (no moon, no tides at Sua Pan), caught no birds and declared it too big and unwieldy. He is convinced that the foot nooses are the best method. We are going to have a contest on 14, 15 November 2001 to see who catches the most flamingos at Walvis Bay each using our own techniques (but the tides are not in my favor then until 02h24!).

I would like to thank L.Y. Osborne, D. and L. Peterson, R. Simmons, W.D. Versfeld, K. Wearne, B. Nebe, S. Dantu, M. Boorman, S. Rue, G. and T. Friederich for help in setting up nets, ringing birds and keeping the fires warm. I am most grateful to Don Featherstone, president of Union Products Inc. for selling me at cost the 7 plastic 'Realmingo™' flamingos we used as decoys.

References

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Lesser Flamingo ringing programme: appeal for information

A long-term ringing programme for Lesser Flamingos has been started by Leicester University, The Wildfowl & Wetlands Trust, and the National Museums of Kenya, supported by the Earthwatch Institute, at Lake Bogoria National Reserve, Kenya, under the auspices of William Kimosop, Warden. The primary purposes of the programme are to collect up-to-date biometrics on the species and to study their migratory patterns. To date, 37 birds have had metal rings placed on their right legs and large orange Darvic (plastic) rings on their left legs, both above the tibia-tarsus joint.

If you observe a bird with these rings, please notify the Ornithology Department, NMK, Box 40658, Nairobi, Kenya (e-mail: kbirds@africaonline.co.ke). If you find a dead Lesser Flamingo with these rings, please send the ring number and finding information to the above address.

Dr Leon Bennun
National Museums of Kenya
Nairobi, Kenya

Colour-ringed birds in Tanzania

If you are visiting Udzungwa Mountains National Park in central Tanzania you just might be able to help Tom Romdal from the Zoological Museum in Copenhagen.

He is doing a research project in the park under TANAPA/TAWIRI authority, and it involves colour ringing of forest birds of all species. So far 464 birds have been ringed, but many more will hopefully be ringed in 2001–2002. If you see a bird with any sort of ring please contact him. Please inform him of the colour and position of rings as well as the altitude of the location where you saw the birds.

The site is the Mwanihana forest near the trail leading from Sonjo village up towards Mwanihana Peak. The Mwanihana trail is very nicely kept and used by tourists who go for the view from the peak at 2050 m. Tom fully recommends the trail to birders who are interested in the local specialities. You should be able to record species such as Moreau's Sunbird, Greenthroated Greenbul, Rufouswinged Sunbird, Swynnerton's Robin and Dapplebreast. Feel free to contact him for infomation if you are planning to go!

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Blacksmith Plover settling onto its eggs. Photo by D.H. Oschadleus.

Ringers' Training Workshop

BirdLife SA's Wetland Centre, Wakkerstroom

Saturday 1 to Saturday 8 December 2001

- **Training course:** The South African Bird Ringing Unit (SAFRING) is running a training course from Saturday, 1 December, to Saturday evening 8 December 2001. The training course will provide instruction on a variety of bird-ringing techniques, with the main focus on developing mistnetting skills. Beginners, current trainees and new ringers will all benefit.

- **Venue:** BirdLife South Africa's Wetland Centre, Wakkerstroom. The town is a 285 km drive from Johannesburg on the old Durban Road, via Standerton and Volksrust. Ringing stations will be set up in a number of habitats including wetland, grassveld, thornveld, montane forest and Leucosidea-scrub. An extensive network of gravel roads is available for those who wish to capture and ring raptors.

- **Accommodation:** BirdLife South Africa Wetland Centre: (1) Dormitory: self-catering: R65.00 p.p.d. (communal kitchen, bedding provided), (2) Camp site: R30.00 per site (max. 4 people per site), tented camping only. Please note there will be an additional charge of R10.00 per person for 'non-BLSA members'. Other camping and B&B facilities are also available in the area; for information contact André Botha, details below.

- **Cost:** The cost of the course is R500 for trainees.This covers the cost of rings, use of equipment, workshop material and two social braais. Excluded are the cost of accommodation and other meals. The administration fee for ringers is R30 per day.

- **Information/bookings:** Sue Kuyper, ADU, UCT, Rondebosch 7701
  Tel/fax: (021) 650-3434, email: sunshine@maths.uct.ac.za or:
  André Botha, tel/fax: (017) 730-0433, email: ajbotha@dorea.co.za

SAFRING is a project of the Avian Demography Unit of the University of Cape Town. Its main sponsors are the South African Department of Environmental Affairs and Tourism, BirdLife South Africa, the Namibian Ministry of Wildlife and Tourism, and the Tygerberg Bird Club. The University of Cape Town provides accommodation and services.

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Notice to contributors

- Ringers are encouraged to send contributions to *Afring News*.
- Articles should be typed in double spacing using wide margins. Contributors are urged to submit their text in ASCII format on stiffy disk, or via email.
- Black-and-white illustrations of general impressions and/or specific species are always in demand; the artist will be acknowledged on the flagstaff page.
- Colour or black-and-white photographic prints of ringed birds or any ringing procedure or site are also very welcome.
- Submissions should reach SAFRING by June or November for inclusion in that issue.
- Suggestions for improvement to the format or content, together with all other material for the publication, should be addressed to:

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