BIRD LONGEVITY IN THE EASTERN HIGHLANDS OF ZIMBABWE – FIRST REPORT

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Introduction

A complete change of scene; from the torrid swamps of Malawi's lower Shire valley to the mountains on Zimbabwe's eastern border, where there is a somewhat different avifauna, although many 'old friends' are present. After four years of ringing a wide variety of birds in the Mutare area, it seems time to assess the results obtained so far, particularly as the period included a major drought.

Sites

Mistnetting started at Mitsasa, Fern Valley (19°03'S, 32°39'E, altitude 1 200 m) in July 1990, on a very erratic basis, but usually on two to four days a week, and continued thus to the end of June 1994. The site is on a hillside south of Mutare, in the rain shadow of the Bvumba Mountains and the vegetation is mainly dry, open miombo woodland with some *Acacia/Terminalia* (which is the main vegetation type in the valley bottom). As yet, exotic flowering shrubs and planted aloes are too small to have altered the basic habitat much, but there is more sunbird food than is normal in miombo woodland. As there are bird baths and a feed table with 'wild bird' seed, other groups also find more sustenance than is usual in the area.

Miombo woodland does not support a large avifauna, although a good variety occurs, so it seemed that Mitsasa could never compare with Nchalo, Malawi, as a ringing station; other sites were needed, where more than 1,8 birds might be caught per trapping day.

Having agreed to concentrate on sunbirds, La Rochelle Botanical Garden, Penhalonga (18°54'S, 32°42'E) was an obvious choice. It is north of Mutare, south of Penhalonga, with an altitude similar to that at Mitsasa. The rainfall is greater, although the streams and dam dried up in the drought. The surrounding natural vegetation has been replaced almost entirely by pine and *Eucalyptus* plantations, but some miombo and *Acacia* remain nearby. However, nets are only set among exotic flowering shrubs, in mainly exotic forest and in the aloe garden. Trapping has taken place monthly from July 1990 to May 1994 (unfortunately June 1994 was missed).

The Vumba Botanical Garden, on top of the Bvumba Mountains (19°07'S, 32°47'E, altitude 1 550 m) is also a good place for sunbirds and the surrounding montane forest and grassland are home to other groups which come into the garden shrubberies where the nets are set. The rainfall is high and the dam held water during the drought. Trapping started in August 1990 and has continued monthly up to May 1994.

Mountain Home, Penhalonga (18°50'S, 32°41'E, altitude 1 460 m) is a private home on the side of a border mountain north of Penhalonga, with a high rainfall. Hundreds of sunbirds flock there to feed on proteas, aloes and exotic plants in the garden, but montane forest and grassland species also occur. Trapping only started there, mainly among the proteas and near the ever-full bird bath, in July 1992 when the drought was approaching its height and has continued monthly to May 1994.

Table 1. Number of individuals ringed and recaptured or resighted in the Mutare area between July 1990 and June 1994, showing probable effect of drought in 1991-1992 and poor rains in 1992-1993.

Year ringed	Number ringed	Number and percentage recaught after			
		<1 yr	>1 yr (%)	>2 yr (%)	>3 yr (%)
1990-1	1 049	149	93 (8,9)	28 (2,7)	21 (2,0)
1991-2	1 364	217	48 (3,5)	20 (1,5)	
1992-3	1 171	114	48 (4,1)		
1993-4	1 019	77			
Totals	4 603	557	189	48	21

Hillcrest College, Penhalonga (18°55'S, 32°39'E) is quite close to La Rochelle, although lower and much drier, but so far has only been used for ringing demonstrations, when the presence of a lot of children has precluded the capture of many birds. The vegetation is basically dry *Acacia* scrub and both Whitebellied and Scarletchested Sunbirds *Nectarinia talatala* and *N. senegalensis* occur there, while at the other sites they do not, so perhaps more work should be done there.

Results

Table 1 shows the number of birds ringed at all five sites between July 1990 and June 1994 and the number of individuals recaptured or resighted at least once during that time (many birds have been colour-ringed). Many birds have been seen or caught several times and the present annual retrap rate is over 25% of the number ringed, which bodes well for the long-term study of individuals of a variety of species. However, looking at the "number and percentage retrapped after more than one year" column, it is evident that something, presumably the 1991-1992 drought, reduced the percentage of birds which were recaught after one year during 1992-1993 and 1993-1994. At the two-year level there is a reduction in the percentage retrapped in 1993-1994 from that retrapped in 1992-1993, but that figure is probably also low.

Table 2 gives a breakdown of the numbers ringed and retrapped or resighted at the different sites, with the percentage which are known to have lived for at least one year. Hillcrest College may be ignored, but of the others,

Mitsasa has the lowest retrap rate, possibly because it was most affected by the drought. Even so, 6,0% were present in the garden one or more years after being ringed, consisting mainly of seedeaters and omni-vores other than sunbirds, although one Miombo Sunbird[1] has been recaptured after more than three years.

La Rochelle shows a different picture, with good numbers recaptured even at the third year level; more than two thirds of these were sunbirds. Vumba B.G. shows a low recapture rate at both the first and second year level, but the high number recaptured in the third year (mainly sunbirds) brings up the overall percentage. Mountain Home, where trapping

[1]Latin names are given in Table 4.

Table 2. Number of individuals ringed and recaptured or resighted at five sites in the Mutare area between July 1990 and June 1994, including one bird ringed elsewhere, but retrapped at Vumba Botanical Garden during 1990-1994. Also shown, number ringed to June 1993 and total number and percentage known to have lived for more than one year after being ringed. Mit = Mitsasa, La R = La Rochelle, VBG = Vumba Botanical Garden, Mt H = Mountain Home, H C = Hillcrest College.

Site	Number ringed to June 94	Number recaught after				Number ringed to June 93	Total surviving >1yr (%)
		<1yr	>1yr	>2yr	>3yr		
Mit	1 112	220	38	14	1	887	53 (6,0)
La R	1 756	210	84	25	12	1 526	121 (7,9)
VBG	1 014	75	37	9	8+1	755	54 (7,2)
Mt H	706	52	30			401	30 (7,5)
H C	15	0	0			0	
Totals	4 603	557	189	48	21+1	3 569	258 (7,2)

only started in the middle of the drought, shows a fairly high first year recapture figure, two thirds of which consists of sunbirds.

Table 3 shows the number of birds ringed annually at four sites up to June 1993, in order that ringed birds would have had a chance to be retrapped up to twelve months later, and the number and percentage known to have lived for more than one, two or three years. Here the 'drought effect' is more obvious, with considerable reduction in the number of birds recaptured in 1992-1993 and 1993-1994 at some sites, but the results are very varied. At Mitsasa in 1993-1994, quite a lot of birds were recaught after one or two years, whereas at La Rochelle and Vumba B.G. in 1993-1994, a fairly large number were recaught only at the three-year level.

Table 4 shows how many individuals of which species are known to have lived for more than one, two or three years. It includes a wide variety, but a surprising number of sunbirds have been recaught over a fairly long period of time (especially at La Rochelle), despite the drought. That a large bird like the thrush should have survived for over three years (at Vumba B.G.) is not surprising, but the recapture of an apalis there after three years is more unexpected. That three seedeaters (one from Vumba B.G. and two from La Rochelle) have been recaught after over three years is most surprising, considering the lack of food after the drought.

Table 5 lists the known minimum age of the 45 oldest recaptured or resighted birds. Age was calculated with reference to the dates of first and last capture, to the breeding season and to the appearance of the bird.

Where signs of immaturity were observed on the first occasion, a bird was aged to the nearest six months, but where it was apparently adult when ringed, an estimate was made of the minimum time required for that species to lose all signs of immaturity and this was added to the time elapsed between ringing and last capture or sighting, the age being given as "more than" the total, also to the nearest six months.

Table 3. Number of birds ringed at four sites near Mutare in each year up to June 1993 and number recaught after more than one, two or three years. Percentage recaptured is given in brackets. Site names as in Table 2.

Site	Year	No. Ringed	Number and % recaught after >1yr(%)	>2yr(%)	>3yr(%)	Comments
Mit	1990-1	294	23 (7,8)	4 (1,4)	1 (0,3)	Normal 1 yr? Reduced 2/3 yr.
	1991-2	476	7 (1,5)	10 (2,1)		Reduced 1 yr, increased 2 yr.
	1992-3	117	8 (6,8)			Nearly normal?
Totals		887	38	14	1	
La R	1990-1	505	51 (10,1)	17 (3,4)	12 (2,4)	Normal 1 yr? Little drop 2/3 yr?
	1991-2	609	26 (4,3)	8 (1,3)		Reduced 1 and 2 yr.
	1992-3	412	7 (1,7)			Very low 1 yr.
Totals		1 526	84	25	12	
VBG	1990-1	249	19 (7,6)	7 (2,8)	8 (3,2)	Normal 1 yr? Reduced 2 not 3 yr?
	1991-2	265	15 (5,7)	2 (0,6)		Small drop 1 yr, big drop 2 yr.
	1992-3	241	3 (1,2)			Very low 1 yr.
Totals		755	37	9	8	
Mt H	1992-3	401	30 (7,5)			Normal 1 yr?

The ten year-old Bronze Sunbird was ringed by Alec Manson at Seldomseen (near Vumba B.G.) in 1984, as an immature, but is has been retrapped regularly in the Gardens between 1990 and 1994. The rest were ringed by my team and include five of over 4,5 years, 27 of four or more and twelve of 3,5 or more years old. Only five of these birds were ringed when immature, all in 1990-1991. There are 35 males and ten females, 31 being sunbirds. Most are insectivorous or omnivorous, but four are basically seedeaters.

Discussion

So far, obviously, no bird ringed by my team can have lived for more than four years since it was ringed, but 21 have survived for more than three years. These, and the birds which have survived for more than two years, lived through 'the worst drought in living memory'. That something had an effect on retrap rates is evident in the reduction in the number of birds recaptured more than a year after being ringed (Table 1) from 93 (8,9% of birds ringed the previous year) recaught in 1991-1992 before the effects of the drought were felt, to 48 (3,5%) in 1992-1993.

From observation and from trapping figures it was evident that bird numbers throughout the Mutare area reduced from about May-June 1992 when food supplies dwindled and temperatures dropped for the winter, but the heat of September-November 1992, coupled with the almost total lack of food and water, reduced bird numbers much further (Hanmer & Chadder 1993).

Table 4. Species of which birds were recaught or resighted more than one, two or three years after being ringed. Interim recaptures of individuals whose final capture is shown in a later year are given in brackets. One Bronze Sunbird recaptured regularly (shown as +) was ringed in 1984.

Species		Number recaught after		
		>1yr	>2yr	>3yr
Laughing Dove	*Streptopelia senegala*	2		
Speckled Mousebird	*Colius striatus*	6	1	
Brownhooded Kingfisher	*Halcyon albiventris*		1	
African Hoopoe	*Upupa epops*	1		
Whyte's Barbet	*Stactolaema whytii*	1		
Goldenrumped Tinker Barbet	*Pogoniulus bilineatus*	1		
Eastern Honeyguide	*Indicator meliphilis*	1		
Eastern Saw-wing	*Psalidoprocne orientalis*	1		
Black Cuckoo Shrike	*Campephaga flava*		1	
Blackheaded Oriole	*Oriolus larvatus*	1		
Pied Crow	*Corvus albus*	(1)	1	
Blackeyed Bulbul	*Pycnonotus barbatus*	8	4	
Terrestrial Bulbul	*Phyllastrephis terrestris*	2		
Stripecheeked Bulbul	*Andropadus milanjensis*	2		
Yellowbellied Bulbul	*Chlorocichla flavivientris*	1		
Kurrichane Thrush	*Turdus libonyanus*	1 (1)	1	2
Olive Thrush	*T. olivaceus*	2	1	
Common Stonechat	*Saxicola torquata*	1		
Heughlin's Robin	*Cossypha heuglini*	2		
Garden Warbler	*Sylvia borin*		1	
Greencapped Eremomela	*Eremomela scotops*	1		
Barthroated Apalis	*Apalis thoracica*	6 (1)	1	1
Neddicky	*Cisticola fulvicapilla*	1		
Yellow Warbler	*Chloropeta natalensis*	1		
Chinspot Batis	*Batis molitor*	1	1	
Paradise Flycatcher	*Terpsiphone viridis*		1	
Longtailed Wagtail	*Motacilla clara*		1	
Redbacked Shrike	*Lanius collurio*	1		
Puffback	*Dryoscopus cubla*	1		
White Helmet Shrike	*Prionops plumatus*	2		
Gurney's Sugarbird	*Promerops gurneyi*	1		
Bronze Sugarbird	*Nectarinia kilimensis*	7 (5)	1 (3)	2+1
Miombo D C Sunbird	*N. manoensis*	12 (5)	3 (2)	2
Yellowbellied Sunbird	*N. venusta*	18 (2)	3	2
Olive Sunbird	*N. olivaceus*	34 (5)	8 (4)	6
Black Sunbird	*N. amethystina*	7 (3)	4 (1)	1
Collared Sunbird	*Anthreptes collaris*	10 (1)	1	
Yellow White-eye	*Zosterops senegalensis*	7 (1)	5	2
Greyheaded Sparrow	*Passer griseus*	1		
Yellowthroated Sparrow	*Petronia superciliaris*	1		
Spectacled Weaver	*Ploceus ocularis*	2		

Table 4. Recaptures (continued).

Species		Number recaught after		
		>1yr	>2yr	>3yr
Spottedbacked Weaver	*P. cucullatus*	2	1	
Bronze Mannikin	*Spermestes cucullatus*	4 (2)	2	
Redthroated Twinspot	*Hypargos niveoguttatus*	2 (2)	1	1
Bluebilled Firefinch	*Lagonosticta rubricata*	2		
Blue Waxbill	*Uraeginthus angolensis*	5 (2)	2	
Common Waxbill	*Estrilda astrild*	2		
Pintailed Whydah	*Vidua macroura*	1		
Cape Canary	*Serinus canicollis*	6 (2)	2	1
Yelloweyed Canary	*S. mozambicus*	3		
Bully Canary	*S. sulphuratus*	10	1	1
Streakyheaded Canary	*S. gularis*	2		
Goldenbreasted Bunting	*Emberiza flaviventris*	2		
Totals		189 (33)	48 (10)	21+1

The summer of 1992-1993 was also rather dry, which may account for only 48 (4,1%) of those ringed in 1992-1993 having been seen in 1993-1994, more than a year after being ringed, but others may be caught in the early part of the 1994-1995 season and increase the total. In fact, of the birds ringed in 1990-1991, 142 lived for more than a year, while 68 of those ringed in 1991-1992 also did, but as one sample covers three years and the other only two, they are not comparable, so only first year figures were used.

Of the sites, from observation, Mitsasa was badly affected by the drought, which probably accounts for the small number of old birds, but the continuous availability of seed and water did assist in the survival of seedeaters. Both La Rochelle and Vumba B.G. show higher recapture figures than does Mitsasa, Vumba B.G. having a slightly better recapture rate at the three-year level (Table 3), although from Table 2, La Rochelle seems to have had more birds present for over a year. However, this is mainly due to the large number of sunbirds recaptured at La Rochelle when the aloes flowered during the winter of 1992. For the rest of the year there was little food or water and very few birds were seen, whereas at Vumba B.G., although numbers declined, there were always some birds about. A study of the numbers and species caught at both sites up to May 1993 shows Vumba B.G. to have been a better habitat than La Rochelle during the drought (Hanmer & Chadder 1993). Trapping figures for Mitsasa were not discussed in that paper.

Recapture figures show that both botanic gardens were able to support a larger avifauna throughout the drought than could a more natural environment like Mitsasa. However, looking at Table 4, it is noticeable that there are very few birds shown in brackets (apart from some sunbirds), *i.e.* few birds appear to have been present at one site continuously throughout the two or three years that they are known to have lived. It may be that they were present, but were not recaught or resighted, but I wonder if they really were? I suspect that many birds moved away from their usual haunts when conditions became impossible and some may have found a 'haven' in which to sit out the drought and then have returned to their original territory. Certainly the numbers present at La Rochelle

Table 5. Age, to the nearest six months, of the 45 oldest birds known in the Mutare area up to June 1994. Birds ringed as adults, whose actual age is unknown, are shown as 'more than' the minimum possible age. Sites as in Table 2.

Species	Site	Ring No.	Age ringed	Sex	Actual age (yrs)
Kurrichane Thrush	VBG	4-81551	Adult	M	> 4
	VBG	4-81553	Adult	M	> 4
Olive Thrush	VBG	4-81571	Adult	F	> 4
Barthroated Apalis	VBG	AB 69238	Adult	M	> 4
Bronze Sunbird	VBG	AA 65742	Imm	M	10
	VBG	AB 69204	Adult	M	> 4,5
	VBG	AA 60999	Adult	M	> 4
	VBG	AA 91663	Adult	M	> 3,5
Miombo Sunbird	Mit	X 62872	Adult	M	> 4,5
	La R	AB 69397	Adult	M	> 4,5
	Mit	X 63082	Adult	M	> 4
	Mit	AA 91714	Adult	M	> 3,5
Yellowbellied Sunbird	La R	X 62885	Adult	M	> 4
	La R	X 62961	Adult	M	> 4
	VBG	X 62901	Imm	F	4
	VBG	X 62900	Adult	M	> 3,5
	La R	X 62950	Adult	M	> 3,5
Olive Sunbird	La R	AB 69367	Adult	M	> 4,5
	La R	AB 69369	Adult	M	> 4
	La R	AB 69218	Adult	M	> 4
	La R	AB 69315	Adult	M	> 4
	La R	AA 91541	Adult	M	> 4
	La R	AB 69360	Adult	M	> 4
	La R	AB 69231	Adult	F	> 4
	VBG	AA 91611	Adult	M	> 4
	La R	AA 91627	Adult	M	> 3,5
	La R	AA 91542	Imm	F	3,5
	VBG	AA 91578	Imm	M	3,5
	Mt H	AD 01414	Imm	M	3,5

Table 5. Age of the 45 oldest birds known in the Mutare area (continued).

Species	Site	Ring No.	Age ringed	Sex	Actual age (yrs)
Black Sunbird	La R	AA 91615	Adult	M	> 4
	Mit	AA 91716	Adult	M	> 4
	La R	AB 69328	Adult	M	> 4
	La R	AA 91570	Imm	M	4
	La R	AA 91549	Adult	F	> 3,5
	La R	AA 91683	Adult	F	> 3,5
Yellow White-eye	La R	X 63058	Adult	F	> 4,5
	Mit	X 63040	Adult	F	> 4
	La R	AA 91624	Adult	M	> 4
	La R	AA 91619	Adult	M	> 4
	La R	X 63059	Adult	F	> 3,5
Spottedbacked Weaver	Mit	BC 07568	Adult	M	> 4
Redthroated Twinspot	La R	AB 69392	Adult	M	> 4
Cape Canary	VBG	AB 69296	Adult	M	> 4
	VBG	AA 91511	Adult	M	> 3,5
Bully Canary	La R	AA 60965	Adult	F	> 4

and Vumba B.G. were extremely low between September 1992 and February 1993 and at Mitsasa practically all birds (apart from some seedeaters) disappeared during that time, yet afterwards several 'old' birds suddenly reappeared.

Of the old birds (Table 5) only five (apart from the ten year-old Bronze Sunbird) were ringed as immatures during 1990-1991, but even these were adult by the time the worst effects of the drought became manifest. A table has not been constructed to show the age structure of the groups of birds which have been recaught over one or two years, but a high proportion were adult when ringed, whereas, of the large number of young birds ringed before June 1992, practically none has been seen since. Further, a very high proportion of the birds (many of them sunbirds) ringed between March and June 1993 were young and Tables 1 and 3 show how few were recaught a year later at La Rochelle and Vumba B.G., although lack of trapping in June 1994 may have affected this result. The Mitsasa figure is higher, due to the birds in question being seedeaters which had food and water available; probably few of the birds, especially sunbirds, hatched in the Mutare area during the summer of 1992-1993, survived the following winter and early summer when, although not extreme, drought conditions did continue. Age may have a lot to do with survival.

Using recapture data to show survival, there must be an assumption that the birds are resident in, or at least return regularly to, some place. Perhaps the 'drought effect' is irrelevant and these 'survival' figures are merely a reflection of how much movement has taken place. Adults become attached to a territory, but young birds wander and may never return to where they were ringed. Perhaps birds at La Rochelle are more resident than those from high altitude or from miombo woodland. Against that is the 7,5% retrap rate in the first year at Mountain Home, which is fairly high altitude and where ringing started in the middle of the drought. There may be other factors involved, but the drought must have had an effect and movement does occur.

A Miombo Sunbird, ringed at La Rochelle, was recovered near Osborne Dam 30 km away. A Yelloweyed Canary was recovered over 1 km from Mitsasa, while a Brubru *Nilaus afer* and a Puffback were recovered 4 and 12 km from Mitsasa respectively.

At Vumba B.G., two Bronze Sunbirds have been retrapped, which were ringed at Seldomseen a couple of kilometres distant. Also, among the retrapped birds are two Palearctic migrants, a Garden Warbler recaught at the site of ringing two years later and a Redbacked Shrike recaught one year later, as well as two Afrotropical migrants, a Yellow Warbler retrapped after one year and a Paradise Flycatcher retrapped after two.

The reason for concentrating on sunbirds, was to attempt to plot their movements, since they appear to be opportunistic feeders, moving from one patch of flowering plants to another. With four sites in the same general area at which nets are set to catch the sunbirds flocking to some prime food source, if the birds were going from one place to another, one would expect to retrap birds at a site other than that at which they were ringed. However, apart from the two Bronze Sunbirds mentioned above (one of which was an immature when ringed and probably wandered until he took up a territory at Vumba B.G., where he has remained continuously for over 3,5 years), only one retrap of this nature has been handled. A Malachite Sunbird *Nectarinia famosa*, ringed at Seldomseen in June 1992, was retrapped at Mountain Home four months later. The distance is about 31 km. The Malachite Sunbird disappears from Vumba B.G. (where it is a winter visitor) in late September or early October and goes to higher altitude breeding sites. Perhaps this bird was on its way to the Nyanga Mountains, as Mountain Home lies more or less on a line between the Bvumba and Nyanga Mountains and the species does occur there in summer.

As yet there are no clues as to where sunbirds ringed at La Rochelle (for example) go when they are not at La Rochelle; apparently they do not go to Mountain Home, only two valleys away. That many do leave La Rochelle seems likely; there are large flocks present at certain times of year, but when the shrubberies are relatively flowerless, few remain. However, some individuals return regularly, as shown by the number of birds in brackets in Table 4, and many of these recaptures were roughly a year apart. On the other hand, a few individuals, mainly Olive and Miombo Sunbirds, have been retrapped throughout the year; they may be residents.

Considering longevity (Table 5), the ten year-old Bronze Sunbird is exceptional, but quite a lot of birds are now known to have reached an age of more than four years, while there are several of more than 3,5 years. These are mainly males (35:10), but this is partly due to it being possible to age a young male sunbird accurately for some months longer than one can age a female. There are many female sunbirds in my files which are recorded as being more than three years old and if these were taken into account, the sex ratio would be more even.

However, it was noted that among old birds at Nchalo, Malawi, where trapping continued for 16 years, a higher proportion were males (Hanmer 1989), although the difference there was not as great as it appears to be here.

Most of the old birds in this present study are insectivorous or omnivorous, as was found in Malawi (Hanmer 1989), although there are some seedeaters. It was noticeable, after the drought, that small seedeaters had practically disappeared (apart from some at Mitsasa, where they were fed), especially Bully Canaries from La Rochelle and Cape Canaries from Vumba B.G. It is surprising that, among the very few now present at those sites, three old ones still exist.

Of the 21 birds which have been recaptured more than three years after they were ringed, 13 (62%) were sunbirds. Admittedly, more sunbirds than any other species group have been ringed; 1 291 (36,2%) of the birds ringed up to June 1993 were sunbirds, but sunbirds form 47% of the birds which are known to have lived for more than a year. Of the 1 049 ringed in the first year's trapping in Zimbabwe, 374 (35,7%) were sunbirds, but they form 62% of the number which have survived for more than three years. In Malawi, sunbirds were found to be surprisingly long-lived (Hanmer 1989, p.26); the early Zimbabwe figures seem to confirm this.

Conclusions

After four years of ringing in a variety of habitats in the Eastern Highlands of Zimbabwe, little can be said about the normal longevity shown by birds inhabiting the area, because the almost total drought in the summer of 1991-1992 and the very dry summer of 1992-1993 must have had an effect on survival. Instead, the figures given here only show how many ringed birds have remained in or have returned to a site, to be retrapped during and after the drought.

At botanical gardens more old birds were recaught after the drought than were recaught in basically natural miombo woodland. Most birds left the miombo woodland site during the drought, a few returning afterwards, but it is not known whether or not all the old birds at the botanical gardens remained there throughout the drought; many probably did not.

The majority of recaptured birds were ringed when already adult. It is not known why most of those ringed as immatures have not been seen again. It could be due to juvenile dispersal, but even under normal circumstances many young birds may not survive their first winter or the heat of early summer before the rains come.

Some movement by species or by individuals is normal, immatures in particular being likely to wander, while many sunbird species are deemed to move either irregularly or perhaps around a regular route. A drought causes birds to move in search of better conditions and may well lead to the disappearance of many. Therefore it is impossible to tell whether or not data indicating movement and low recapture figures, especially of birds ringed when immature, are normal or drought-related. Figures for the 1994-1995 and 1995-1996 seasons may solve the problem, assuming it rains.

Insectivores and omnivores form the major proportion of old birds. This appears to be normal, drought or no drought, as apart from doves, seedeaters are not particularly long-lived. However, the large number of old sunbirds found in this area does seem

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