Great Reed Warblers in south-east Botswana

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INTRODUCTION

In Botswana Penry (1994) described the Great Reed Warbler *Acrocephalus arundinaceus* as a sparse to uncommon palaearctic migrant which was recorded only in the north and east during the drought period of the Botswana Atlas survey. Herremans (1997) showed a similar distribution in Botswana although the species occurs throughout much of southeastern South Africa.

In south-east Botswana Great Reed Warblers have mainly been recorded in *Typha* swamp at sewage lagoons and outflows from such lagoons, although there have also been records from along the Ngotwane River and the Limpopo River at Oliphants Drift. Further north at Francistown and Shashe they occur in *Phragmites* which forms fringes to dams and seasonal rivers as well as in *Typha* swamp as at Francistown sewage ponds.

This note reports on the biometrics, moult and arrival and departure times of Great Reed Warblers in south-east Botswana. Some comparisons are also made with other palaearctic warblers caught at Phakalane and with data on Great Reed Warblers from elsewhere in Botswana and in southern Africa.

STUDY AREA AND METHODS

At Phakalane sewage lagoons (24°34'S, 25°58'E), 15 km north of Gaborone (see Tyler & Tyler 1997a,b; Tyler 1998), Great Reed Warblers were mistnetted and ringed in the summer months from 1996/97 to 1999/2000. Mistnets were placed in and at the edge of *Typha* swamp, in fringes of *Typha* around the lagoons and in adjacent tall herbs and *Acacia* scrub at three different sites within the 100 ha complex. On each visit to a site an average of 90 m (54 m to 120 m) of net was erected. A visit or ringing session typically lasted from about 1500 hrs until after dusk when nets were furled or from dawn to 0800–0900 hrs or later depending on the heat. Birds caught in the nets were ringed and weighed (to 0.1 g); wing length (maximum chord) was measured to the nearest 1mm. Net location and net height (i.e. shelf in which the bird was caught) were noted for each bird.

RESULTS

In the first summer (from 20 October to 20 April) 55 birds were caught, whereas in the subsequent summer less than half this number was caught despite more intensive ringing effort. Numbers were even lower the following two summers but ringing effort was much reduced in those seasons, especially in 1999/2000 (Table 1). In 1996/97 there was an apparent influx of birds in late January, when 21 new birds were caught on 27–28 January. Numbers of Great Reed Warblers were exceeded by those of one other palaearctic migrant, the Eurasian Sedge Warbler *A. schoenobaenus*, although Eurasian Reed Warblers *A. scirpaceus* were caught in very similar numbers to Great Reed Warblers.

First and last dates

The earliest bird was caught on 21 November. The last bird in 1996/97 was caught on 23 March, in 1997/98 on 8 March and in

Table 1. Numbers of Great Reed Warblers and other palaearctic *Acrocephalus* warblers caught in the summers of 1996/97 to 1999/2000. Numbers in parentheses refer to additional birds that were re-trapped from a previous year. (Except for one European Reed Warbler first caught in 1996/97 and re-trapped in 1998/9, no birds were re-trapped two years after ringing).

	1996/97	1997/98	1998/99	1999/2000	Totals (new birds)
A. arundinaceus	55	23 (3)	11 (1)	2	91
A. scirpaceus	53	24 (5)	25 (2)	2	104
A. palustris	4	3	0	1	8
A. schoenobaenus	216	178 (9)	43 (6)	15	452
A. griseldis	1	0	0	0	1
Number of sessions	30	40	23	5	98

1999/2000 on 31 March. One was seen on 6 April 2000 but none were caught during ringing sessions on 7 and 8 April. Great Reed Warblers departed earlier than other palaearctic *Acrocephalus* species (Table 2).

Site fidelity and *Ortstreue*

In 1996/97 13 (23.6%) of 55 Great Reed Warblers ringed in that season were re-trapped at the same site where they had been ringed. Of 25 ringed to the end of January, nine (36%) were re-trapped during the two subsequent months. The maximum time between initial capture and retrap dates was 48 days.

Three of the Great Reed Warblers trapped in 1996/97 birds were caught again in 1997/98 (a 5.4% return rate). European Reed Warblers showed a higher return rate with 9.4% of 53 birds caught in 1996/97 being re-trapped in 1997/98 but only one (4.1%) of 24 birds ringed in 1997/98 re-trapped the next season. One from 1996/97 was however, re-trapped after two years. Eurasian Sedge Warblers showed a low recapture rate (4.2%, 3.4%) in subsequent summers (see Table 1).

Table 2. First and last dates of four species of palaearctic migrant at Phakalane sewage lagoons.

	First date	Last date
A.arundinaceus	21 November	31 March
A. scirpaceus	2 November	10 April
A. palustris	31 December	10 April
A. schoenobaenus	29 October	20 April

Table 3. Proportion of birds caught in nets within *Typha* swamp and in edge habitats.

	Typha swamp	Edge habitats
A. arundinaceus	53	47
A. scirpaceus	34	66
A. schoenobaenus	40	60

Habitat use

Birds were caught in both *Typha* swamp and in the tall herbs and *Acacia* savanna bordering the lagoons. Of a sample of 73 Great Reed Warblers (new birds plus retraps), 39 were caught in nets within *Typha* compared with 34 in drier habitats. Three quarters (75.4%) of the birds caught were in the top two shelves of the nets.

Primary moult

The only Great Reed Warbler caught in November had old primary feathers. In December birds were caught with both old and fresh plumage as well as in active (early to mid) moult. Of 47 birds caught in January almost half were in active moult and 25 had com-

Table 4. Numbers of Great Reed Warblers (n = 78) caught between November and March from 1996/97 to 1999/2000 at Phakalane sewage lagoons with old primaries or in active moult (early moult = moult score 1–15; mid moult = score 16–30; late moult = score of 31–44) or with fresh plumage. Re-traps from previous years are included.

	November	December	January	February	March
Old	1		3		
Early moult		1	4	1	
Mid moult		2	5		
Late moult			10	4	2
Fresh	1	25	21	16	

pleted moult (Table 4). One bird was in the early stage of primary moult in February and two birds had yet to complete moult in mid March.

Clearly some birds arrived in Botswana having already completed primary moult but many moulted their primary feathers whilst in Botswana.

Nine birds caught during primary moult were subsequently re-trapped in the same season, but there were widely varying rates of moult progression (Table 5). Assuming a steady rate of growth of primary feathers, primary moult could take from 45 to 425 days, although obviously the latter is much too long.

Biometrics

Wing lengths of 72 Great Reed Warblers caught at Phakalane ranged from 87–103 mm, with a mean of 94.7 mm (SD 3.8). Weight ranged from 21.1 to 38.1 g (n = 76) with a mean weight of 30.2 g. (SD 2.7). Birds were not sexed. No significant difference was found in the mean weights in March and those in earlier months, although the two heaviest birds (36.6 g and 38.1 g) were caught in March.

DISCUSSION

Great Reed Warblers (and Eurasian Reed Warblers) were much less frequently caught than European Sedge Warblers. European Marsh Warbler *A. palustris* was the least commonly caught palaearctic species apart from Basra Reed Warbler *A. griseldis* of which only one was caught (Tyler *et al.* 1997). This contrasts with the situation further north at Nchalo in Malawi (Hanmer 1979), where Great Reed Warblers were the most numerous migrant.

The catch of Great Reed Warblers in 1997/98 was less than half that in the previous summer despite greater ringing effort in the second year. Higher rainfall in 1996/97 might explain the difference. Raijmakers & Raijmakers (1994) also found that in drier areas,

Table 5. Moult progression as shown by moult scores of nine birds caught twice in a season.

First score	4	39	39	2	41	26	44	26	41
Second score	16	45	45	11	43	28	45	38	45
Number of days elapsed	9	26	29	16	8	17	8	8	18
Difference in moult score	8	(6)	(6)	9	2	2	(1)	12	(4)
Number of days taken for an increase in moult score by one	1.1			1.8	4	8.5		0.7	

numbers varied greatly between years.

Great Reed Warblers were present at Phakalane mainly from December to March as found by Penry (1994) with my earliest and latest dates (21 November to 31 March) both being earlier than those recorded in the Raijmakers & Raijmakers' (1994) 'southern Transvaal' study, i.e. several sites between Secunda and Vanderbijlpark, now in Mpumalanga and Gauteng (5 December to 4 April). However, I did have a sight record on 6 April 2000 but no birds were caught during ringing sessions on 7 and 8 April. Dave Philip and Nicky Bousfield caught no Great Reed Warblers during November at Francistown and Selebi Phikwe, their earliest bird being on 11 December. Their latest however, was on 15 April. Further north in Malawi, Hanmer (1979) recorded Great Reed Warblers between 25 November and 16 April. Penry (1994) referred to birds usually arriving in mid-October, his earliest date being 26 September, but Herremans (1997) suggested treating such early dates with caution. Herremans (1994) gave the median arrival date as 1 December (n = 11) with earliest and latest dates being 9 October and 11 April respectively.

Site fidelity in the Great Reed Warbler has been well-documented (Hanmer 1989a; Urban *et al.* 1997). Although birds were faithful to sites at Phakalane within a season, site fidelity in the subsequent season (*Ortstreue*) was rather low (5.4%). Raijmakers & Raijmakers (1994) only retrapped one bird in a subsequent season in their study area between Secunda and Vanderbijlpark. *Ortstreue* is higher in more mesic areas (e.g. Manson 1985; Hanmer 1986, 1989b). Hanmer (1989b) also demonstrated the species' longevity by re-trapping three birds from seven to nine years after they had been ringed.

Wing lengths of Great Reed Warblers at Phakalane were very similar to those found in other studies in Europe and Africa (Table 6).

Weights of Phakalane Great Reed Warblers were also very similar to those found in other studies (Table 7). Hanmer (1979) caught her heaviest birds in March. Raijmakers & Raijmakers (1994) found that weight increased by 3–4 g by March from a mean weight of 29.6 g in December and 30.5 g in January and February to a mean in March of 33.8 g.

There was much overlap in habitat used by Great Reed Warblers and other smaller palaearctic species, as well as the intra-African migrant African Reed Warbler *Acrocephalus baeticatus* and the resident Lesser Swamp (Cape Reed) Warbler *A. gracilirostris*. The small species, European Sedge, European Reed and African Reed Warblers foraged extensively away from the *Typha* as did

Table 6. Wing lengths (mm) of Great Reed Warblers in eight study areas in Europe and Africa.

Reference	Country	Sample size	Range	Mean	S.D.
Williamson (1963)	Europe	39	87–104	95.6	2.74
Pearson & Backhurst (1988)	Kenya	100	89–103	96.4	
Manson (1985)	Zimbabwe	97	86–101	94.5	3.45
Raijmakers & Raijmakers (1994)	South Africa	42	91–101	95.5	2.94
K. Raijmakers & S. Raijmakers	South Africa	111	82–102	94.5	3.57
Urban, Fry & Keith (1997)	Africa	10 males 10 females	93–99 89–96	95.5 91.3	
This study	South-eastern Botswana	72	87–103	94.72	3.56
D. Philip & N. Bousfield	Eastern Botswana	112	90–108	96.7	3.1
Monadjem (2000)	Swaziland	5 females 2 males	89–93 103–104	91.6 103.5	

Table 7. Weight (g) of Great Reed Warblers in eight study areas in Europe and Africa.

Reference	Country	Sample size	Range	Mean	S.D.
Williamson (1963)	Europe	32	27–33	29.8	1.0
Hanmer (1979)	Malawi	266	24–38		
Pearson & Backhurst (1988)	Kenya	44	21.2–33.5	27.5	
Manson (1985)	Zimbabwe	100	23.5–38.8	29.6	2.6
Raijmakers & Raijmakers (1994)	South Africa	49	25–39	31.4	3.3
K. Raijmakers & S. Raijmakers	South Africa	109	19.8–39	29.9	3.54
This study	South-eastern Botswana	76	21.1–38.1	30.25	2.68
D. Philip & N. Bousfield	Eastern Botswana	95	24.7–35	29.64	2.43
Monadjem (2000)	Swaziland	7	25–32	28.9	

Great Reed Warblers although all were caught within the swamp as well. Great Reed Warblers were, however, caught mainly at the edges of the swamp and in adjacent scrub, as also noted by Herremans (1997), whereas the relatively large Lesser Swamp Warblers were caught, mainly within the *Typha* swamp. Tree (1971) found in the eastern Cape that Great Reed Warblers avoid *Typha* but this seemed not to be the case at Phakalane sewage ponds. Lesser Swamp Warblers, European Sedge and African Reed Warblers were also caught at lower levels in the net than the Great Reed Warblers. Loske & Lederer (1988) noted that Great Reed Warblers prefer higher vegetation types than European Sedge Warblers. In a brief study at Lake Naivasha in Kenya (Tyler 1991; Tyler *et al.* 1991) the abundant Lesser Swamp Warbler (65% of the total catch of *Acrocephalus* and *Bradypterus* warblers from January to March 1990) also occurred mainly within swamp vegetation close to the lake edge. Great Reed Warbler was a much less common species, and was caught in nets within the swamp vegetation and in a seasonally inundated zone with scrub further away from the lake. Capture heights were rather similar though for these two species at Naivasha, with both species occurring most commonly in the second shelf at less than 0.5 m above the ground.

Pearson (1975) suggested that many Great Reed Warblers reach southern Africa unmoulted in November and December, followed in December and January by a fresh arrival of birds which have completed moult in the northern tropics. Data from Phakalane are not conclusive as so few birds were caught in the earlier part of the season, but tend to support Pearson's hypothesis. In the early summer one bird with worn plumage and several in early moult were netted. In January and February more than half the birds caught already had freshly moulted primaries. The rest were in moult or still with old feathers. Further north in eastern Botswana, at Francistown sewage ponds and at an industrial site at Selebi Phikwe, two birds with old plumage and two in very early stages of moult were caught in December (D.A. Philip & N. Bousfield pers. comm.). In January 14 birds were noted as having fresh wing feathers with four others half to three-quarters through moult, whilst 14 in February also had freshly moulted wings with six others nearly completing moult. A similar pattern to that found at Phakalane and Francistown was evident in the 'southern Transvaal' study of Raijmakers & Raijmakers (1994). They caught some birds in mid January that were only just starting moult, whereas birds caught at the beginning of January had almost completed moult. Data from my site are too few to show the duration of moult. Raijmakers & Raijmakers suggested that it might be about 55 days although Hanmer (1979) estimated the duration in three birds as 85, 87 and <96 days. The Phakalane data provide few data on moult progression (see Table 6).

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REFERENCES

Hanmer, D. 1979. A trapping study of Palaearctic passerines at Nchalo, southern Malawi. Scopus 3: 81-92.

Hanmer, D. 1986. Migrant Palaearctic passerines at Nchalo, Malawi. Safring News 15: 19-28.

Hanmer, D.B. 1989a. *Orstreue* demonstrated by migrants at Nchalo, Malawi. Safring News 18: 33–42.

Hanmer, D.B. 1989b. The end of an era – final longevity figures for Nchalo. Safring News 18: 19–30.

Herremans, M. 1994. Fifteen years of migrant phenology records in Botswana – a summary and prospects. Babbler 28: 47–68.

Herremans, M. 1997. Great Reed Warbler. In: Harrison, J.A., Allan, D.G., Underhill, L.G., Herremans, M., Tree, A.J., Parker, V. & Brown, C.J. (eds). The atlas of southern African birds. Vol. 2: Passerines. Johannesburg: BirdLife South Africa.

Loske, K. -H. & Lederer, W. 1988. Moult, weight and biometrical data for some palaearctic passerine migrants in Zambia. Ostrich 59: 1–7.

Manson, A.J. 1985. Results of a ringing programme at Muruwati Farm, Mazowe. Honeyguide 31: 203–211.

Monadjem, A. 2000. Warblers ringed in Swaziland between 1994 and 1999. Safring News 29: 73–78.

Pearson, D.J. 1973. Moult of some Palaearctic warblers wintering in Uganda. Bird Study 20: 24–36.

Pearson, D.J. 1975. The timing of complete moult in the Great Reed Warbler *Acrocephalus arundinaceus*. Ibis 117: 506–509.

Pearson, D.J. & Backhurst, G. 1988. Characters and taxonomic position of Basra Reed Warbler. British Birds 81: 171–178.

Penry, H. 1994. Bird atlas of Botswana. Pietermaritzburg: University of Natal Press.

Raijmakers, J.M.H. & Raijmakers, J.H.F.A. 1994. Distribution, size and moult of migrant warblers in the southern Transvaal. Part 1. Safring News 23: 65–71.

Tree, A.J. 1971. Notes on Palaearctic passerines in the esastern Cape. Ostrich 42: 198.

Tyler, S.J. 1991. Birds of Lake Naivasha 2. Foraging niches and relationships between migrant and resident warblers in papyrus swamp. Scopus 14: 117–124.

Tyler, S.J. 1998. A study of warblers in reedswamp in southeast Botswana. In: Adams, N.J. & Slotow, R.H. (eds). Proc. 22 Int. Orn. Congr., Durban. Ostrich 69: 336.

Tyler, S.J. & Tyler, L. 1997a. A year's ringing at Phakalane Sewage Lagoons in south east Botswana. Safring News 26: 81–83.

Tyler, S.J. & Tyler, L. 1997b. Observations on the seasonal presence and moult of European Reed Warblers *Acrocephalus scirpaceus* at a site in southeast Botswana. Ostrich 68: 117–118.

Tyler, S.J., Tyler, L. & Lewis, J.M.S.L. 1991. Birds of Lake Naivasha 1. General studies. Scopus 14: 107–116.

Tyler, S.J., Lewis, J.M.S. & Tyler, L. 1997. First record of Basra Reed Warbler *Acrocephalus griseldis* in Botswana. Ostrich 68: 44–45.

Urban, E.K., Fry, C.H. & Keith, S. 1997. The birds of Africa. Vol. V. London: Academic Press.

Williamson, K. 1963. Identification for ringers 1. The genera Cettia, Locustella, Acrocephalus and Hippolais. Tring: British Trust for Ornithology.