EIGHT CONSECUTIVE PRIMARY MOULTS OF A LAUGHING DOVE *STREPTOPELIA SENEGALENSIS*

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The recapture history of the Laughing Dove *Streptopelia senegalensis* which bore ring number D13490 is not primarily interesting because it was captured 46 times over a period of seven years (Table 1), but it probably is exceptional in being observed during eight consecutive primary moults.

D13940 was trapped in a zap net (Underhill & Underhill 1987) on a frequently baited garden lawn in Mowbray (33°57'S, 18°29'E), a suburb of Cape Town. This bird was not trap-happy; the zap net was operated on average about six times per month, so that D13490 was caught on about 10% of occasions. A total of *c.* 3 000 Laughing Doves were handled over a 10-year period.

When first caught in July 1986, it was aged as an adult and was close to the end of primary moult (Table 1). Juvenile Laughing Doves commence their first primary moult at an age of about seven weeks (Heÿl 1982), but cease to be readily recognizable as first-year birds towards the end of this first moult (Hunter 1973). D13490 may therefore have been a first-year bird when first handled. It was thus at least seven years old when last handled in September 1993. It was not sexed during any of the handlings.

At each capture, this dove was weighed, to the nearest 1 g, on a 300 g Pesola spring balance, and its state of primary moult recorded, using the standard method (Ginn & Melville 1983). The primary moult score was converted to "percentage feather mass grown" (PFMG), using the method described in Underhill & Joubert (1995). PFMG takes account of the fact that the inner primaries of a Laughing Dove are less than half the mass of the outer primaries (Underhill & Joubert 1995). PFMG = 0 indicates that the primaries are all old, PFMG = 1 indicates all new, and intermediate values indicate the proportion of total primary mass that has been replaced. For example PFMG = 0,5 indicates that primary moult is halfway to completion in the sense that half the total mass of new primaries has been grown; for Laughing Doves, this score is reached during the moult of the seventh primary.

D13490 was captured and recaptured within a single moult cycle seven times; from the rate of moult progression in these observations, the average duration of moult was estimated to be 201 days. If we assume that feather material is grown at a constant rate, PFMG can be used to estimate the starting date of moult in each year using the equation:

estimated starting date = capture date –201 x PFMG.

These estimated starting dates for each year are presented in Table 2. The potential estimation errors are smaller if the bird is not far into moult; the starting dates are therefore estimated from the first capture during a moult cycle, and the number of days by which the capture date were backdated is given in Table 2.

The dates over which moult commenced ranged over nearly two months; the earliest estimated starting date was 10 November in 1988/89, and the latest was 7 January in 1990/1991, 58 days later; these extreme dates are estimated with little error (Table 2). The esti-

Table 1. Recapture history of Laughing Dove D13490. Primary moult scores are given from innermost to outermost primary. Percentage feather mass grown (PFMG) calculated as in Underhill & Joubert (1995).

Date	Mass (g)	Primary moult	PFMG scores
9 Jul 1986	91	5555555554	.982
12 Sep 1986	92	0000000000	.000
17 Sep 1986	94	0000000000	.000
20 Dec 1986	94	5531000000	.192
26 Dec 1986	96	5553000000	.261
2 Jan 1987	86	5554000000	.281
13 Jul 1987	84	5555555555	1.000
14 Aug 1987	94	5555555555	1.000
20 Aug 1987	86	5555555555	1.000
26 Aug 1987	95	5555555555	1.000
13 Nov 1987	90	1000000000	.008
16 Nov 1987	90	2000000000	.024
26 Nov 1987	102	4000000000	.056
22 Jan 1988	91	5553100000	.272
6 Jun 1988	98	5555555555	1.000
2 Sep 1988	96	0000000000	.000
14 Sep 1988	92	0000000000	.000
21 Oct 1988	103	0000000000	.000
14 Nov 1988	90	2000000000	.024
28 Apr 1989	86	5555555552	.912
28 Sep 1989	95	0000000000	.000
5 Dec 1989	102	3000000000	.040
22 Dec 1989	96	5200000000	.091
23 Feb 1990	89	5555200000	.326
5 Mar 1990	94	5555510000	.395
21 Mar 1990	92	5555540000	.472
15 Aug 1990	96	5555555555	1.000
28 Aug 1990	102	5555555555	1.000
4 Sep 1990	93	0000000000	.000
10 Sep 1990	95	0000000000	.000
4 Oct 1990	99	0000000000	.000
31 Oct 1990	107	0000000000	.000
4 Feb 1991	90	5555300000	.348
23 Feb 1991	104	5555530000	.446
28 Jun 1991	92	5555555555	1.000
10 Oct 1991	107	0000000000	.000
23 Dec 1991	96	0000000000	.000
15 Jan 1992	95	3000000000	.040
6 Feb 1992	86	5400000000	.126
7 Feb 1992	89	5410000000	.135
1 Apr 1992	90	5555551000	.499
9 Oct 1992	96	0000000000	.000
10 Oct 1992	99	0000000000	.000
17 Apr 1993	106	5555555200	.647
20 Aug 1993	98	5555555555	.000
22 Sep 1993	101	0000000000	.000

mated number of days that elapsed between the start of one primary moult and the next varied between 323 days (10,6 months) and 438 days (14,4 months). These data indicate considerable variation in the timing of moult for an individual bird in successive years.

This variation might be due to breeding success and number of clutches; however, timing of breeding and timing of moult are poorly correlated in this species and these two phases of the annual cycle frequently overlap (Rowan 1983). Alternatively, the variation in timing could be due to between-year differences in food availability. The variation in the timing of moult for this bird suggests that control of the start of moult was not closely driven by the circannual cycle.

There was no discernible pattern in the seasonal mass of D13490 (Figure 1). Several studies, reviewed by Rowan (1983), have found significantly heavier masses for columbids in winter, but this was not apparent for this individual. However, the bird did tend to get heavier as it aged (Figure 2). The correlation between mass and year was

Table 2. Estimated starting dates of primary moult for Laughing Dove D13490 in the summers 1985/86–1992/93. The number of days backdated is the period between the estimated starting date and the first observation of the bird during the moult cycle. Estimated starting dates are likely to be reliable if the period backdated is relatively short.

Year	Estimated starting date	No. of days backdated
1985/86	24 December	197
1986/87	12 November	38
1887/88	12 November	1
1888/89	10 November	4
1989/90	27 November	8
1990/91	26 November	70
1991/92	7 January	8
1992/93	8 December	130

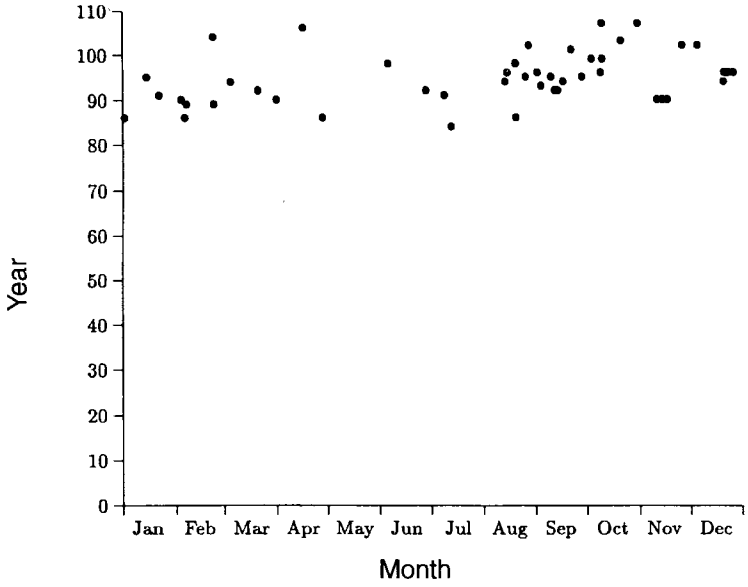

Figure 1. The masses of Laughing Dove D13490 at each capture plotted seasonally (*i.e.* ignoring the year of capture).

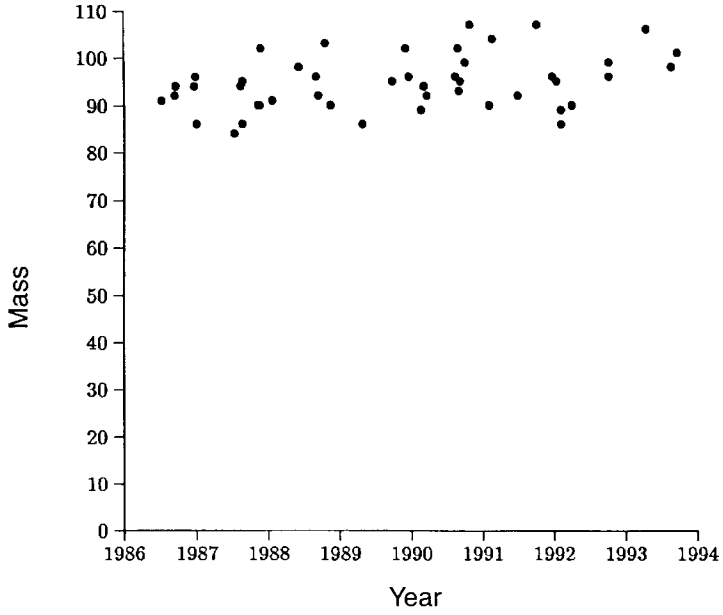

Figure 2. The masses of Laughing Dove D13490 at each capture plotted through time.

significant ($r = 0.362$, $P = 0.014$). The slope coefficient of the regression line was 1.005, indicating an average increase of 1 g per year.

Unfortunately, the bird was not recovered, and the lawn on which the birds were captured ceased to be available from the beginning 1994, so the ultimate fate of this bird is not known.

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