ARTICLES & REPORTS

CAPTURE/RECAPTURE DATA ON THE NIGHTJARS OF RANELIA FARM, ZIMBABWE

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The nightjar population in 100 ha of Ranelia Farm (19°22S, 32°37E 885 m a.s.l.), 45 km south of Mutare, Zimbabwe, was studied intensively for four consecutive breeding seasons in 1972-1975 and again briefly in 1981-1982 (Jackson, in press, a). This paper comments on some of the capture/recapture data from this study, which formed part of an M.Sc. thesis submitted to the University of Natal, Pietermaritzburg (Jackson, 1983).

METHODS

The birds were found and trapped by means of nightlighting and mistnetting (Jackson, in press, b), each bird captured being ringed before being released. The rings were supplied by the South African Bird Ringing Unit, to whom my thanks are due.

RESULTS

Nightlighting and mistnetting led to the capture of 107 individual nightjars, including 30 juveniles, during the study period. One adult male European Nightjar *Caprimulgus europaeus*, two juvenile Fierynecked Nightjars *C. pectoralis* and one juvenile Freckled Nightjar *C. tristigma* were taken for museum and aviary studies. Five juvenile Fierynecked Nightjars disappeared before they were old enough to be ringed. The other 98 birds were ringed and released. Of these, 72 (including 17 juveniles) were Fierynecked Nightjars, 11 (two juveniles) were Moçambique Nightjars *C. fossii*, eight were Pennantwinged Nightjars *Macrodipteryx vexillaria*, five (three juveniles) were Freckled and two were European Nightjars.

Many of the birds ringed were subsequently recaptured, as shown in Table 1 (pp 44-46), which merely lists the number of individuals recaptured each year and not the total number of individual recaptures. For example, of the 10 male Fierynecked Nightjars ringed in 1972, three were recaptured that same year, six were recaptured in 1973, two in 1974 and five in 1975. Two of them (Nos. 17 and 23) were in fact recaptured every year, and one (No. 28) was recaptured in 1981 during a follow-up exercise, nine years after it was ringed as an adult.

TABLE 1

CAPTURE/RECAPTURE DATA FOR NIGHTJARS IN THE RANELIA STUDY AREA DURING 1972-1975

SPECIES	YEAR RINGED	YEAR RECAPTURED	NUMBER OF BIRDS MALES	FEMALES	JUVENILES	TOTAL
European Nightjar *Caprimulgus europaeus*						
	1975	-	0	2	0	2
Fierynecked Nightjar *C. pectoralis*						
	1972	-	10	5	4	19
	-	1972	3	1	1	5
	-	1973	6	3	0	9
	-	1974	2	0	0	2
	-	1975	5	2	0	7
	1973	-	6	9	7	22
	-	1973	3	2	5	10
	-	1974	0	1	0	1
	-	1975	6	3	0	9
	1974	-	3	2	0	5
	-	1974	1	0	0	1
	-	1975	0	1	0	1
	1975	-	7	13	6	26
	-	1975	3	6	6	15

TABLE 1 (contd.)

SPECIES	YEAR RINGED	YEAR RECAPTURED	NUMBER OF BIRDS MALES	FEMALES	JUVENILES	TOTAL
Freckled Nightjar *C. tristigma*						
	1972	-	1	1	0	2
	-	1973	0	1	0	1
	-	1974	0	1	0	1
	-	1975	1	1	0	2
	1974	-	0	0	2	2
	1975	-	0	0	1	1
	-	1975	0	0	1	1
Moçambique Nightjar *C. fossii*						
	1972	-	1	2	0	3
	-	1973	1	2	0	3
	1973	-	3	1	2	6
	-	1973	1	0	2	3
	1974	-	1	0	0	1
	1975	-	1	0	0	1
	-	1975	1	0	0	1

(contd.)

TABLE 1 (contd.)

SPECIES	YEAR RINGED	YEAR RECAPTURED	NUMBER OF BIRDS MALES	FEMALES	JUVENILES	TOTAL
Pennantwinged Nightjar *Macrodipteryx vexillaria*						
	1972	-	1	1	0	2
	1973	-	3	2	0	5
	-	1973	1	2	0	3
	1975	-	0	1	0	1
	-	1975	0	1	0	1

A substantial number of adult Fierynecked Nightjars were recaptured one, two or three years after ringing. The two adult Freckled Nightjars ringed in 1972 were both recaptured in 1975. Moçambique Nightjar adults, however, were not recaptured more than one year after ringing and no European or Pennantwinged Nightjar adult was recaptured other than in the year of ringing. In the case of the 22 juveniles ringed, none was recaptured in later years.

Longevity

The capture/recapture data (Table 1) show that seven of the 15 Fierynecked Nightjars captured as adults in 1972 were recaptured in 1975, when they were at least four years old. However, none of the 20 ringed in 1975 was recaptured in October 1981; any recapture then would have been at least seven years old. During this follow-up exercise in 1981, 15 Fierynecked Nightjars were captured, one of them being a recapture from the study period. This bird, male No. 28 ringed on 30 October 1972, was recaptured on eggs on 16 October 1981, when it was at least ten years old, and recaptured again on 14 January 1982. The Freckled Nightjar pair ringed in 1972 were still present in 1975, but by July 1981 had been replaced by a new pair. No Moçambique or Pennantwinged Nightjars were recaptured more than one year after ringing.

DISCUSSION

Population densities

One aim of the fieldwork at Ranelia was to capture all the nightjars present in the study area each season. This was certainly not achieved in 1972, when mistnets were not used, nor in 1974, when too little time was spent in the field. In 1973 and 1975, however, the search and capture effort was such that very few individuals could have been overlooked. The capture/recapture data for these two seasons should, therefore, provide population densities.

Population figures can be extracted from Table 1. For example, there were at least 19 Fierynecked Nightjar females present in the study area during 1975 (13 ringed that year, plus recaptures of one from 1974, three from 1973 and two from 1972). Figures for 1973 and 1975 are given for all species in Table 2 (overleaf). In 1973 at least 37 adult nightjars were present in the study area of 100 ha, a population density of one nightjar/2,7 ha. The 1975 figure of 43 adults gives a population density of one nightjar/2,3 ha and a mean density for the two seasons of one nightjar/2,5 ha.

On this basis a breeding pair would need about 5 ha and the study area of 100 ha could accommodate about 20 pairs. In fact, 16 breeding pairs were recorded in 1973 and 15 in 1975, about one pair/6,5 ha (Table 2).

Life-span and longevity

Thomson (1964) writes: "In all but the largest birds, relatively secure from predators, the actual life-span is so short in comparison with the potential life-span that the mortality rate of any species in the wild is often constant in successive years of individual age, after the dangerous juvenile stage, and may even decline with age. In other words, senescence is not usually a factor.". Lack (1964) says that "... in all the birds so far studied the adult death-rate is constant with respect to age, up to an age when extremely few individuals are left alive, ...".

There is no reason to believe that nightjars are an exception to this general rule, so it will be assumed that the adult mortality rate for these birds at Ranelia was constant. It will also be assumed, in view of the strong territoriality demonstrated (Jackson in press, a), that there was no emigration of adults from the Fierynecked Nightjar population. The study period at Ranelia was too short to confirm these points from the capture/recapture data, but these data do provide clues to the average life-span of adult Fierynecked and adult Freckled Nightjars.

TABLE 2

NIGHTJAR POPULATION DENSITIES AT RANELIA, BASED ON THE MINIMUM NUMBER OF ADULTS PRESENT IN THE 100-ha STUDY AREA DURING THE 1973 AND 1975 BREEDING SEASON.

(Breeding pairs taken from case history cards, other data from Table 1)

SPECIES	1973	1975
European Nightjar *Caprimulgus europaeus*		
Males	0	0
Females	0	2
Fierynecked Nightjar *C. pectoralis*		
Males	12	18
Females	12	19
Breeding pairs	(11)	(13)
Freckled Nightjar *C. tristigma*		
Males	0	1
Females	1	1
Breeding pairs	(1)	(1)
Moçambique Nightjar *C. fossii*		
Males	4	1
Females	3	0
Breeding pairs	(3)	(0)
Pennantwinged Nightjar *Macrodipteryx vexillaria*		
Males	3	0
Females	2	1
Breeding pairs	(1)	(1)
TOTAL ADULT NIGHTJARS IN 100 ha	37	43
Hectares/adult nightjar	= 2,7 ha	= 2,3 ha
TOTAL BREEDING PAIRS IN 100 ha	16	15
Hectares/breeding pair	= 6,3 ha	= 6,7 ha

In 1972 we ringed 15 adult Fierynecked Nightjars; seven were recaptured in 1975, giving an average life-span of between five and six years. In 1973 we again ringed 15, nine of which were recaptured in 1975, giving an average life-span of exactly five years. In 1975 we ringed 20, none of which was recaptured in 1981, indicating an average life-span of no more than six years. These figures, which are independent of each other, all point to an average life-span of five to six years for adult Fierynecked Nightjars.

Individual birds can, of course, live much longer and these provide an indication of the potential life-span. Lack (1964) has pointed out that "This 'potential age' should be clearly distinguished from the average age to which birds may be expected to live in the wild.". A male Fierynecked Nightjar ringed at Ranelia as an adult on 30 October 1972, was recaptured, sitting on eggs, on 16 October 1981, when it was at least ten years old, and was recaptured again on 14 January 1982. This individual had lived to at least twice the average age for adults of its species.

On the evidence of the solitary pair of Freckled Nightjar adults in the study area, it would seem that the average life-span of adults of this species is no shorter than for Fierynecked Nightjars, but it could well be longer. My data for Moçambique Nightjars provide no help on this point, but two adult males ringed by Hanmer (1981) were recaptured when about six years old, so the average life-span of adult Mocambique Nightjars may be similar to Fierynecked Nightjars. Schlegel (1969) provides no information on the life-span of adult European Nightjars but suggests that it must be long in view of the high mortality rate of the young.

REFERENCES:

Hanmer, D.B. 1981. Longevity from retraps. Safring News 10: 12-22.

Jackson, H.D. 1983. The breeding biology and distribution of *Caprimulgus pectoralis* and related species in Zimbabwe, with a key to the nightjars of Africa and its islands, 158 pp. Unpublished M.Sc. thesis. University of Natal: Pietermaritzburg.

Jackson, H.D. In press, a. Aspects of the breeding biology of the Fierynecked Nightjar. Ostrich.

Jackson, H.D. In press, b. Finding and trapping nightjars. Bokmakierie.

Lack, D.L. 1964. Article "Life, expectation of". In Thomson, A.L. (ed.). 'A New Dictionary of Birds'. London & New York.

Schlegel, R. 1969. Der Ziegenmelker (*Caprimulgus europaeus L.*). Neue Brehm Büch. (406): 1-80.

Thomson, A.L. (ed.). 1964. 'A New Dictionary of Birds', 1-928. London: British Ornithologists' Union.

H. D. Jackson. Natural History Museum of Zimbabwe (National Museum), P.O. Box 240, BULAWAYO, Zimbabwe.

Fierynecked Nightjar on 'nest'
(T.B. Oatley)

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