This is an appendix to the paper by Kruuk *et al.* 1999 Early determinants of lifetime reproductive success differ between the sexes in red deer. *Proc. R. Soc. Lond.* B **266**, 1655–1661.

Electronic appendices are refereed with the paper. However, no attempt has been made to impose a uniform editorial style on the electronic appendix.

Methods

Total population density

A female was defined as resident if she was observed in at least 10% of the 40 censuses during a year. Density is defined in female numbers because males move in and out of the study area, and previous analyses have shown reproduction and survival to be principally related to female density (Clutton-Brock *et al.* 1985)

Local population density

Detailed census data were not available for 1971 - 1973: for calves born in these years, mother's value was taken as the average of that observed in later years, since female home ranges remain approximately constant over succeeding years. The scaling parameter was set at 96.5 in the hierarchical cluster analysis (Coulson *et al.* 1997).

Paternity assignment

Conception was assumed to have occurred in the interval 230-240 days before the birth of a calf, a window of one standard deviation on either side of the mean gestation period. In the case of ties between two or more males, paternity was assigned at random to one individual; this inevitably reduced the resolution of paternity assignment but maintained levels of mean breeding success. Males who were observed to be behaviourally active during ruts (i.e. holding harems) but who were not assigned any paternities by the above method were given a score of zero.

The behavioural method of paternity assignment is not as reliable as the use of genotypic data, and in particular may slightly underestimate the success of the best males, generating a downward bias in the variance (Pemberton *et al.* 1992). However genetic sampling of the population before 1981 is sparse, and for individuals born since 1982, the correlation between a male's total breeding success estimated this way and total breeding success estimated using a likelihood-based analysis of genetic data (Marshall *et al.* 1998) was 0.86.

References

Clutton-Brock, T. H., Major, M. & Guinness, F. E. 1985 Population regulation in male and female red deer. *Journal of Animal Ecology* **54**, 831-846.

Marshall, T.C., Slate, J., Kruuk, L.E.B. & Pemberton, J.M. 1998 Statistical confidence for likelihood-based paternity inference in natural populations. *Molecular Ecology* **7**, 639-655.

Pemberton, J. M., Albon, S. D., Guinness, F. E., Clutton-Brock, T. H. & Dover, G. A. 1992 Behavioural estimates of male mating success tested by DNA fingerprinting in a polygynous mammal. *Behavioural Ecology* **3**, 66-75.

Tables

Table A1. *Sample sizes for each cohort.*

Year of Birth	71	72	73	74	75	76	77	78	79	80	81	82	83	84	Total
Females	5	5	1	12	9	8	8	9	10	9	4	8	8	5	101
Males	1	8	2	3	6	9	6	3	8	2	6	4	8	6	72