FIELD CRITERIA FOR AGEING IMMATURE BLACK RHINOCEROSES Diceros bicornis L.

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An important problem with which wildlife biologists are faced is the assignment of age to immature animals in the field. In species which have a short seasonal peak in breeding, this is often a relatively simple matter and criteria such as horn development can be used. In non-seasonal breeders the problem is more difficult.

For some years now the author has been making subjective assessments of age in a population of black rhinos in Hluhluwe Game Reserve, Zululand. However, recent studies in East Africa have highlighted the need for more objective criteria on which to base comparative studies of different populations of this species. Goddard (1967) uses three categories in the calculation of recruitment rates in Ngorongoro and Olduvai; adult, immature and calf. He provides no indication of ages of the last two categories. He simply defines an 'immature' animal as 'one that is less than full-sized which has left its mother' and a 'calf' as an 'immature animal which is still with its mother'.

Roth and Child (1968) grouped rhinos into three age classes depending on their weight (estimated). "Specimens under 600 lbs. were classed as calves and were probably not over one year old; older subadults weighing 600 - 1600 lbs. were classed as juveniles, these were smaller than adults and were probably between one and $3\frac{1}{2}$ years old. Rhino heavier than 1600 lbs., i.e. older than $3\frac{1}{2}$ years were not distinguishable and termed 'adult', although they were not necessarily all sexually mature."

Schenkel and Schenkel (1969) provide a diagram illustrating the size differences between baby, $\frac{1}{4}$, $\frac{2}{3}$ calf and $\frac{3}{4}$ subadult, but again no attempt is made to relate these to chronological age.

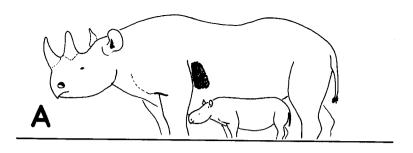
Direct studies on the ageing of black rhinoceroses in Zululand are limited to one by Anderson (1966) in which a series of skulls is analysed. This study will be brought up to date in due course in the light of further information which has accrued.

For the purposes of a current study of the population ecology of the black rhinoceros in Hluhluwe Game Reserve (Hitchins 1968) it was necessary to define the categories used. Table I presents the data obtained to date and relates five size categories illustrated in Figures I to 5 and Plates I to 5 to the estimated ages of I5 animals. The development of the characteristic skin lesions (Hitchins and Keep, in press) and of horns is also related to these size classes. Some of the animals used in this study were followed for up to 3 years and are still under observation.

TABLE I - SIZE CLASSES OF IMMATURE BLACK RHINOCEROSES

SIZE CLASS		۷			60			U			۵			ш	
DESCRIPTION: 1. Size in relation to adult. 2. Skin lesions.	Level with inguinal region of adult female.	h inguin. dult feme		Top of s with ver absent	Top of shoulder level with ventral part of v. absent	Top of shoulder level Shoulde with ventral part of vulva, of tail. absent absent absent	Should of tail. Start a absent	Shoulder level w of tail. Start appearing c absent on sides.	ith base in chest,	Shoulder hetween between beson reg sacral reg Present on sides.	er height: n base of region. t on chesiss.	Shoulder height at a level Slightly smaller than between base of tail and adult. Present on chest, absent Present on chest, start developing on sides but generally not in the usual position behind the shoulder.	Slightly s adult. Present o developin generally ual positi	Slightly smaller than adult. Present on chest, start developing on sides but generally not in the ushoulder.	than t, start des but the us- ind the
3. Horns	absent			Anterio 'knob li ches in ior horr	Anterior horn small and 'knob like' (approx 3 in- ches in length). Poster- ior horn not noticeable)	all and ox 3 in- Poster- ceable)	Anterio 8 inche terior h	Anterior horn approx. 6-8 inches in length. Posterior horn noticeable.	prox. 6- th. Pos- eable.	Anterior 12 inche erior ho inches,	Anterior horn approx, 8- 12 inches in length, posi erior horn approx, 2-4 inches,	Anterior horn approx. 8- Anterior horn approx 12 inches in length, post-12 inches in length, erior horn approx. 2-4 posterior horn approxinches.	Anterio 12 inch posteri 2-4 inc	Anterior horn approx. 10- 12 inches in length, posterior horn approx. 2-4 inches.	prox. 10- gth, oprox.
	Figure 1, Plate 1.	Plate 1.		Figure	Figure 2, Plate 2.	2.	Figure	Figure 3, Plate 3		Figure	Figure 4, Plate 4.	4.	Figure	Figure 5, Plate 5.	5.
Evidence:	No. D	Date E	Est. Age	No.	Date	Est. Age	ģ	Date	Est. Age	° Ž	Date	Est. Age	Š	Date	Est. Age
	68b 11. 53c Dec 31b 13.	11. 7. 66 2 wks. Dec. 1963 I mnth. 13. 9. 63 I mnth.	wks. mnth.	53c A	Nov. 1964		53c /	26. 1. 66 2 years 12. 12. 64 1½ yrs.	2 years	68b. 53c	25. 7. 68 17. 7. 66	+2 years 2½ yrs.	316	9. 7. 66	+3 yrs.
	<u>'C</u>	July 1764 4 mntms. 13. 2. 66 5 mnths 15.10.61 5 mnths 21.12.64 4 mnths	5 morths 5 morths 4 morths					5. 10. 65 16.12.66 28.9.63 13.2.66	1.2 yrs. +1 yr. 2 yrs. 1½ yrs.	2b 30c	4.12.67 +2 yrs.	+2 yrs. 2½ yrs.	28	30.7.68	+3 yrs.
		10.1.65 2 30.8.68 1 13.1.66 1	2 mnths - mnth.	128 b	22.5.69	9 moths	28b	19,12.66 2 yrs.	2 yrs.	786	18.9.68	, 2½ yrs.			
			-	9228	3.1. 67 8.7.66 Dec. '64	1 yr. 8 mnths 6 mnths	12b 82b	30.12.66 +1 yr. 13.2.66 +1½ yrs.	+1 yr. +1½ yrs.	120b	12.9'68	2½ ýrs. +2 yrs.	ź	7	È
		\exists			0	A MILLION	35b	July '64 1½ yrs.	1½ yrs.	35b	9.12.64	2 yrs.	24b 35b	23.7.66	+3½ yrs 3½ yrs.

 $\ensuremath{\mathsf{NOTE}}\xspace$ The numbers quoted in Table I and in the photo captions are those allocated to individual study animals.



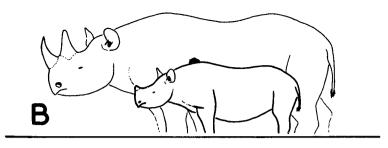
SIZE CLASS: A



FIG: I

Plate I:

Female adult and female calf (68b) - approximately 2 weeks old. July 1966.



SIZE CLASS: B

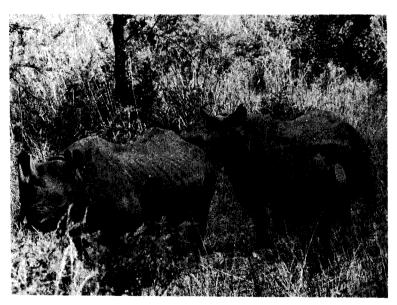
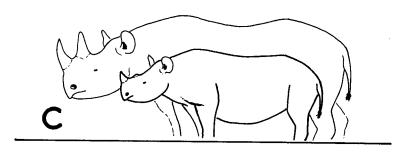


FIG: 2

Plate 2:

Female adult and female calf (53c) - approximately I year old, November, 1964. The animal at the back is a previous calf whose age is estimated at 4 years.



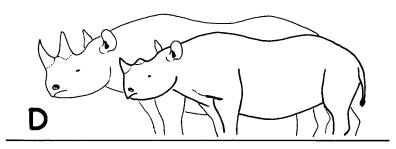
SIZE CLASS: C



FIG: 3

Plate 3:

Female adult and female calf (53c) - approximately 2 years old, January, 1966.



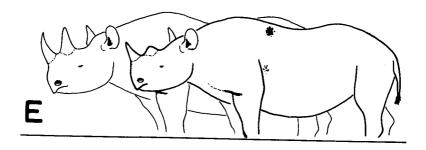
SIZE CLASS: D



FIG: 4

Plate 4:

Female adult and male calf (30c) - approximately $2\frac{1}{2}$ years old, December 1966. Note skin lesions on chest of calf.



SIZE CLASS: E

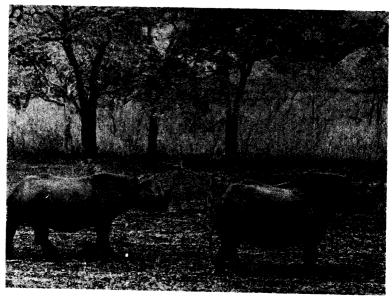


FIG: 5

Plate 5:

Female adult and male calf (31b) - approximately 3½ years old, December 1966. Note skin lesion high up on the shoulder of the calf.

It must of course be recognised that, because of variation in individual growth rates, the size classes described are not neccessarily accurately referable to a particular age but merely to an age range. This problem is compounded by the fact that black rhinos do not have a well-defined breeding season. However, the categories have been found useful in the field and are here described in the hope that other workers will apply them, so that direct comparisons between studies made in different areas will become possible.

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