

# INFLUENCE OF VEGETATION TYPES ON SIZES OF HOME RANGES OF BLACK RHINOCEROS IN HLUHLUWE GAME RESERVE, ZULULAND

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## INTRODUCTION

Studies by Klingel and Klingel (1966), Schenkel (1966) and Goddard (1967) in East Africa indicate that black rhinoceroses have fairly well defined home ranges with no evidence of territoriality. Whilst the author was stationed in Hluhluwe Game Reserve as a ranger in 1962 and 1963, home ranges of some black rhino were mapped in the northern and western areas of the reserve. From these observations it appeared that animals living in savanna had larger home ranges than those occupying thicket. Since black rhino, certainly in Zululand, are browsers, they are largely dependent on woody vegetation as a source of food. Thus, in theory, animals occupying savanna would have to move over larger areas to satisfy their food requirements than those living in thickets.

This study was instigated to ascertain whether the nature of the vegetation is in fact correlated with the size of the home range.

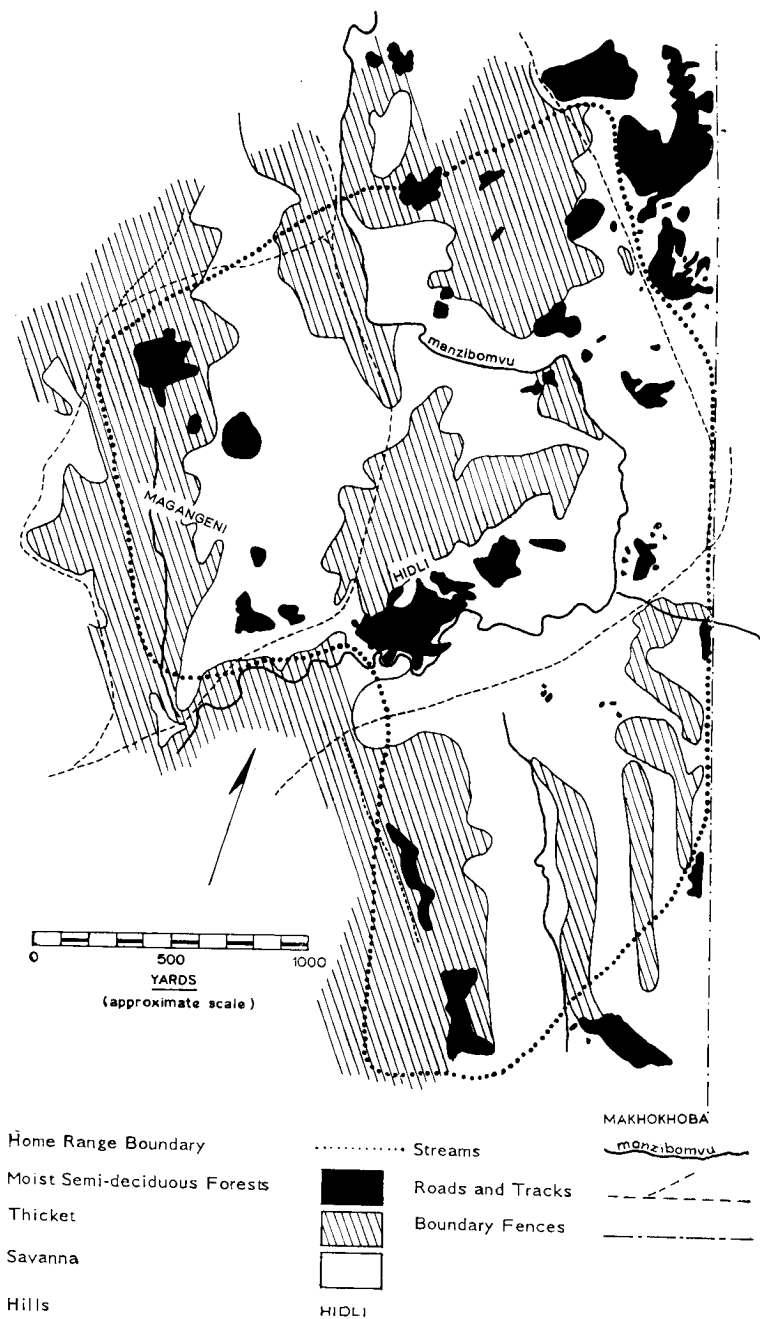
## METHOD

It was found that individual rhino were readily identifiable on the basis of the following characteristics:

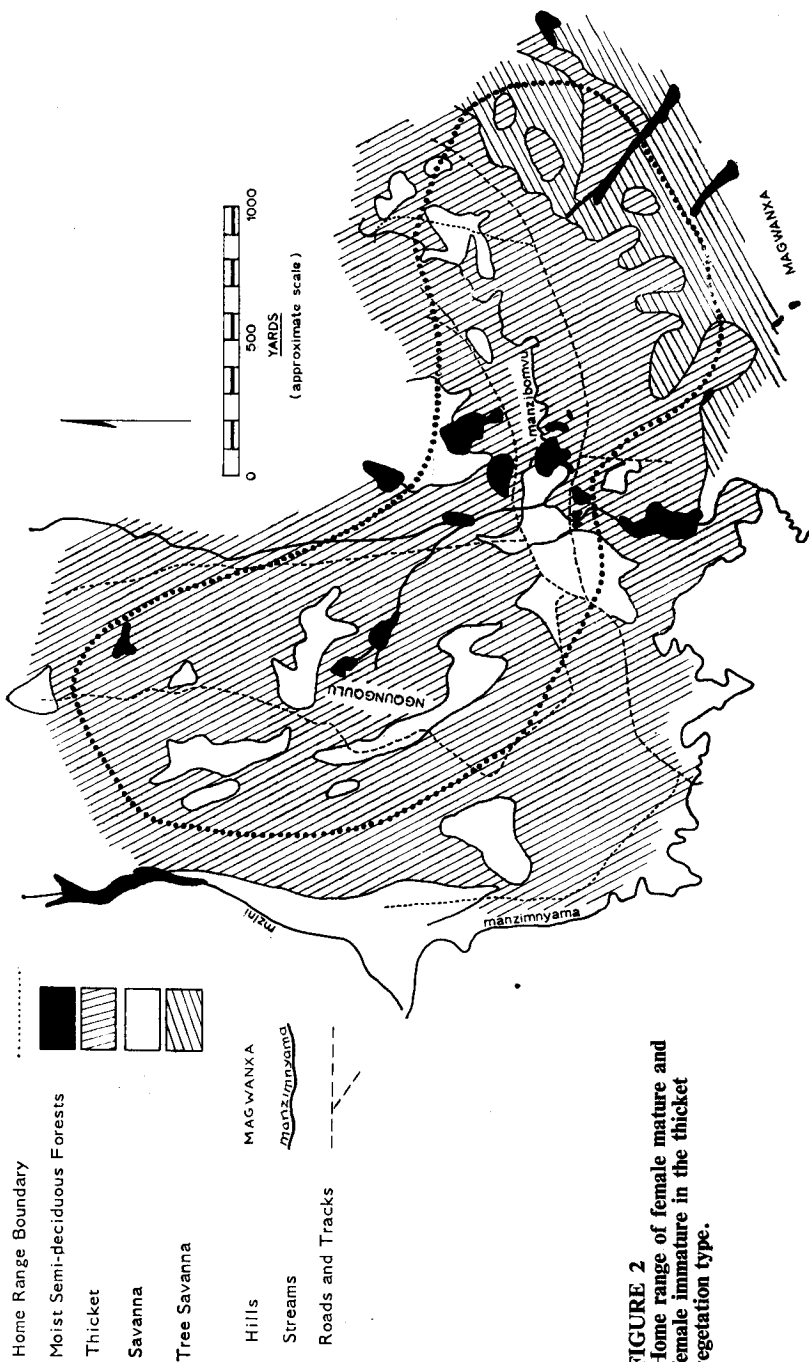
1. Sex;
2. Horns;
  - (a) conformation,
  - (b) length relative to each other;
3. Ears;
  - (a) presence or absence (Note: a few animals have been noted with one or both ears missing),
  - (b) pattern of tears;
4. Tail;
  - (a) presence or absence,
  - (b) abnormalities.

The location of each observation of known individual animals was plotted accurately on a large scale map. From the accumulated records the outermost points were joined and the sizes of the home ranges were then established by means of a planimeter.

Conveniently situated and typical home ranges of two groups of animals, one in savanna and one in thicket, were selected for detailed study. A detailed map of each range was drawn up from aerial photographs and field observations. From a study of the vegetation, the boundaries of the major type were plotted (Figs. 1 and 2). These



**FIGURE 1**  
Home range of female mature and male immature in the savanna  
vegetation type.



**FIGURE 2**  
Home range of female mature and female immature in the thicket vegetation type.

were classified according to the definitions given in the Proceedings of the C.S.A. Specialist meeting on Phytogeography (C.S.A., 1956). Four 200 yd. x 2 yd. belt transects, whose positions were randomly chosen, were completed within each of the selected home ranges. Only the number of woody plants was recorded and the data so obtained were extrapolated to give the mean number of woody plants per acre.

Finally, the home ranges of other rhino (individual animals or groups) overlapping the home ranges of the study animals were also recorded, and a percentage overlap of utilization was calculated for each.

#### RESULTS AND DISCUSSION

The results obtained from the two study areas are presented in Table 1.

**TABLE 1**  
**HOME RANGE CHARACTERISTICS OF TWO GROUPS OF BLACK RHINO**

<i>Home range type</i>	<i>Study Animals</i>	<i>Area of home range (acres)</i>	<i>% Savanna</i>	<i>% Thicket</i>	<i>% Tree Savanna</i>	<i>% Moist semi-deciduous forest</i>	<i>Mean No. of woody plants per acre</i>
Savanna	.. Mature and .. Immature	1,223	63.3	32.6	NIL	3.3	4,391
Thicket	.. Mature and .. Immature	737	10.8	74.4	10.6	4.04	10,259

From the table it is seen that the "savanna" home range selected was found to be almost 1.7 times as large as that situated in thicket. Thicket vegetation took up three-quarters of the area of the "thicket" range, but only about one-third of the "savanna" home range. From the transect data, the mean number of woody plants per acre was found to be about two-and-one-half times greater in the "thicket" home range than in that situated in savanna.

These findings are supported by data obtained from the western part of the reserve, where a further six home ranges were identified. They were subjectively classified as either of the "thicket" or "savanna" type, and the size of each was measured. The results are presented in Table 2.

From the table the very much greater size of "savanna" home ranges is clearly seen. Finally it may be noted that in those parts of the reserve dominated by thicket vegetation, a total of 22 individually identifiable animals have been recorded while only 13 known animals have been recorded in the savanna areas.

**TABLE 2**  
**SIZES OF SIX BLACK RHINO HOME RANGES**

<i>Home Range Type</i>	<i>Rhino Group</i>	<i>Home Range Size (acres)</i>
Savanna	F Mature and M Immature	1,217
	F Mature and M Immature	1,217
	F Mature and F Immature	1,098
Thicket	M Mature	494
	M Mature	551
	F Mature and M Immature	525

Taken together, this evidence shows clearly that the size of black rhino home ranges in the Hluhluwe Reserve varies according to the proportion of thicket and the density of woody plants, and hence presumably according to the availability of food. Animals utilizing thickets have smaller home ranges than those occupying savanna.

The home ranges of other rhino were found to overlap to a considerable extent onto the study home ranges. In the case of the "savanna" range, the overlap (utilization) varied from 0.4 per cent to 100 per cent with a mean of 29 per cent (4 animals). In the "thicket" the overlap varied from 16 per cent to 70 per cent, the mean being 53 per cent (5 animals). This bears out the now quite well documented idea (Klingel and Klingel, 1966; Schenkel, 1966; Goddard, 1967) that the black rhinoceros does not occupy territories in the sense of areas exclusively held and defended against other black rhino.

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**PLATE 1**  
Portion of Savanna home range from the north towards the Makhokhoba hills.



**PLATE 2**  
Portion of Thicket home range from Ngqungqulu towards Magwanxa hill.