MOVEMENT OF MIGRATORY ZEBRA AND WILDEBEEST IN NORTHERN BOTSWANA

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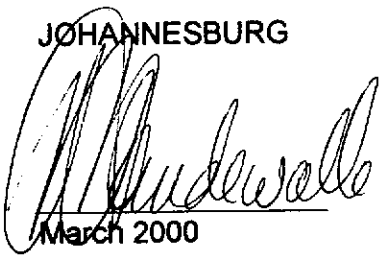

March 2000

DECLARATION

I declare that this thesis is my own, unaided work unless specifically acknowledged in the text. It has not been submitted before for any degree or examination in any other university, nor has it been prepared under the aegis or with the assistance of any other body or organisation or person outside the University of the Witwatersrand, Johannesburg.

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Abstract

Population and seasonal ranges of zebra and wildebeest in northern Botswana were defined and movements between the wet and dry season ranges in relation to rainfall and water availability were assessed. In the wet season ranges, grass species composition, phenology and height were assessed in relation to the selection of feeding sites by zebra and wildebeest. Long-distance movement by zebra within the wet season range was investigated in relation to the availability of nutrient and mineral element concentrations. Faecal analyses were conducted as indicators of crude protein and phosphorus intake.

The pattern of movement of both species was a classic migration and the same distinct and non-overlapping seasonal ranges were used each year. No zebra or wildebeest remained behind in either the wet or the dry season ranges and the whole population moved together. The distance moved by zebra between the wet and dry season ranges was 140 kilometres and by wildebeest 100 kilometres. Zebra ranged over a much larger area (7 285 km^2) than wildebeest (3 556 km^2) did. The southern Mababe region formed an important extension of the zebra's wet season range while wildebeest did not use the Mababe to the same extent. The timing and amount of rainfall at the start of the wet season determined the movement away from the dry season range. Zebra movement from the wet to the dry season range was not related to water availability but wildebeest remained until water in pans had virtually dried up.

Zebra preferred tall grasslands dominated by annual grasses, especially *Urochloa trichopus*, while wildebeest used short, heavily grazed areas dominated by perennial

grasses. As green grass availability declined, both zebra and wildebeest selected higher proportions of green tufts. They grazed all plant parts available and zebra grazed particularly high proportions of large, round seed-heads. Wildebeest also grazed a high proportion of seed-heads but this appeared to be related more to the structure of the grasses that they fed on and the inability to select leaf without also biting off inflorescence and stalk. Reduction in grass height due to grazing had little effect on feeding site selection and movement of wildebeest. Zebra, however, consistently moved long distances in the wet season range once average sward height had been reduced to approximately 15 cm.

Available nutrient and mineral element concentrations were higher in Savuti than Mababe but no significant difference was found in zebra faecal CP and P. The movement of zebra between Savuti and Mababe could not be explained by nutrient differences. Low concentrations of Ca and high concentrations of P and other mineral elements in the forage may confound the influence of nutrients on these movements. Changes in forage abundance remained the best explanation for the wet season movements of zebra.

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Although it seems as though I have walked and stumbled through this project and the thesis writing all on my own, sometimes lost and lonely, I would never have managed to complete it without the assistance of others. To those I mention by name, and the many others who are nameless, not because of their lesser importance but rather because the list would be very lengthy, I am most grateful and sincerely thankful.

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Table of Contents

List of Tables

List of Figures