KRUGER NATIONAL PARK

DEPT. OF RESEARCH AND INFORMATION

MEMORANDUM

MONITORING OF UNGULATE POPULATION STRUCTURE IN THE KRUGER NATIONAL PARK

REPORT ON A SURVEY DURING AUGUST, SEPTEMBER AND OCTOBER 1987

Compiled by:
Dr D R Mason (Senior Research Officer)

Skukuza, 15th June 1988

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INTRODUCTION

Data on age distributions (the proportions of different age-groups) and sex ratios pertaining within animal populations provide a useful basis for assessing recruitment and survival rates. While population trends reflect the interplay of numerous, often variable, environmental factors, they are effectively determined by the relative rates of natality and immigration versus mortality and emigration. Long term monitoring of ungulate populations is essential for understanding their dynamics vis-á-vis environmental variables and thereby providing a basis for enlightened management.

Monitoring of the major ungulate populations in the Kruger National Park (KNP) has largely depended on standardised aerial censusing techniques. These aerial surveys are conducted annually during the dry season and also provide some data on calf percentages and social structure for certain large herbivore populations, but not the more comprehensive data on sex and age composition that can be obtained from periodic sample counts on the ground. Moreover, apparent trends in population numbers based on aerial counts may be subject to counting variability between successive years. Field classifications of sex and age classes also have limitations, particularly in that they do not provide information on adult mortality, which is necessary for interpreting age ratios. Adult mortality rates may markedly influence estimates of juvenile mortality based on the proportions of juveniles and adults at different times, and increases or decreases in population size may occur without change in age ratios (see Caughley 1974). Ideally therefore, a combination of aerial and ground surveys should facilitate more reliable assessment of population trends by providing complementary data on population size and structure.

OBJECTIVES

To facilitate understanding of the processes which naturally regulate ungulate populations in the KNP, regular field classifications of sex and age classes are undertaken to establish base-line data on long-term population dynamics which may then be interpreted in relation to rainfall cycles, predation pressure, management practices, etc.

METHODS

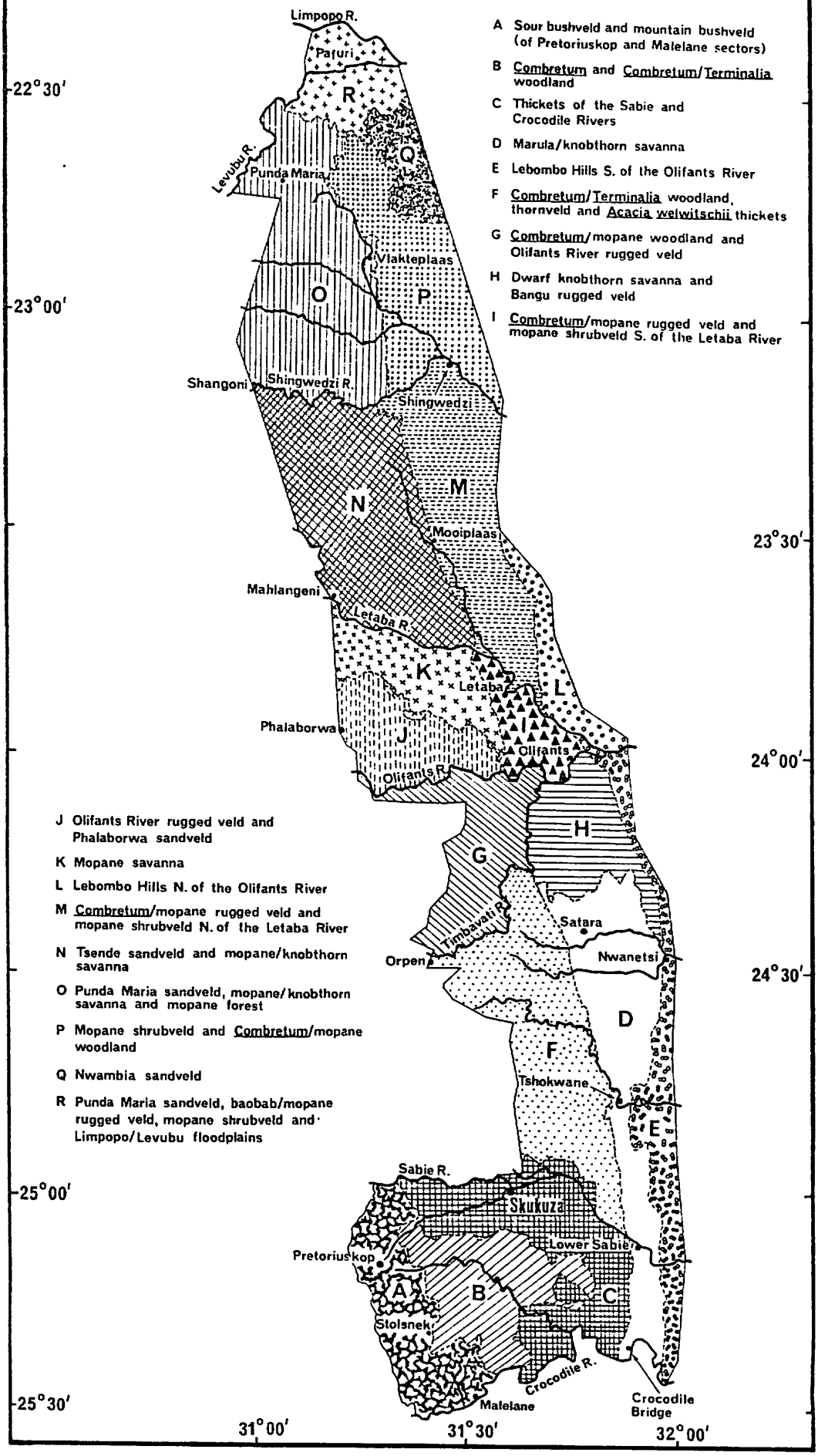
Sex and age classifications of ungulates (excluding buffalo, hippopotamus and impala) were conducted by vehicle throughout the KNP from 6 August to 31 October 1987 in 18 representative sampling regions (Fig. 1) delineated and simplified from the 35 landscape units described and mapped by Gertenbach (1983). Because impala frequently occur in large herds comprising several sex and age classes, sampling of their population structure was entrusted to a team of two observers in a vehicle, but was confined to regions B, C, D and E in the Southern District (south of the Sabie River) during 3 and 4 October, regions D and F in the Central District (between the Sabie and Olifants Rivers) during 5 and 6 October, and regions I, M, O and P in the Northern District (north of the Olifants River) during 7, 8 and 9 October.

Criteria and methods used for sampling population composition of the various ungulates have been detailed by Mason (1984, 1985). Current estimates of ungulate population levels are derived from the 1987 aerial counts using a fixed-wing aircraft to cover the whole KNP, with the exception of a limited section of mountainous terrain situated in the southwestern corner in the Malelane area, which in previous years was covered by helicopter (Hall-Martin, Whyte & Viljoen 1987). However, the omission of this area is justifiable because the low herbivore densities prevailing would add negligibly to the overall counts. Separate helicopter censuses of the Punda Maria-Pafuri region were also discontinued in 1987 but this area was included for the first time in the fixed-wing aerial survey.

RESULTS AND DISCUSSION

Analyses of sex and age composition and categories of social units are tabulated separately (Tables 1-22). Where data for certain ungulates may not be representative due to small sample size, the proportions of sex and age

FIG.1. SAMPLING REGIONS USED FOR MONITORING POPULATION STRUCTURE OF UNGULATES IN THE KRUGER NATIONAL PARK



1977, the 1987 count of 289 animals represented a decrease of 32,2%. The following social units were encountered during the 1987 ground survey of ungulate population structure:

- 1 breeding group (2AF + 3YF + 1J) - region M
- 1 bachelor group comprising 2AM - region M
- 1 lone AM - region M
- 1 breeding group (2AM + 2AF) - region N
- 1 pair (1AM + 1AF) - region N
- 2 bachelor groups comprising 2AM - region P
- 1 bachelor group comprising 3AM - region P
- 4 lone AM - region P

WHITE RHINOCEROS

Total sample = 28 (excluding 2 unclassified individuals)

Sex and age composition: The population sample comprised 23 adults (16M, 7F), 1 subadult male (estimated 3 - 4 years old), 2 subadult females (estimated 2 - 3 years old), 2 unsexed juveniles.

Social units: 6 lone AM, 4 bachelor groups (one comprising 3AM and the remainder 2AM), 1(AF + SAM) pair, 1(AF + SAF)pair, 1(AF + J) pair, 1(AF + J) pair accompanied by 1AM, 1 association of 2AF + 1SAF.

Regions where sightings were recorded: A, B, C, D (39,3% of rhinos classified were from region B and 32,1% from region A).

Note: SA = subadult (2 - 4 years)
The 1987 aerial count of 1 017 white rhinos in the KNP was 13,7% lower than that of 1986, which may reflect an undercount in the Southern District rather than a valid population trend. A 46,7% increase was recorded north of the Olifants River, where 81 rhinos were counted.

BLACK RHINOCEROS

None were observed during the fieldwork.

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ACKNOWLEDGEMENTS

The sample classifications of impala population structure were undertaken by Messrs. R. English and R. Newbery, whose enthusiastic effort is appreciated.