

## THE LEOPARD TORTOISE IN THE MOUNTAIN ZEBRA NATIONAL PARK

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*Abstract* — A total of 69 leopard tortoises *Geochelone pardalis babcocki* (Loveridge 1935) were captured, marked, sexed, weighed and released. The results of this exercise together with other field data are presented and discussed.

### *Introduction*

The leopard tortoise *Geochelone pardalis babcocki* (Loveridge 1935) is widespread in Africa from Ethiopia south throughout most non-forested areas of the eastern half of Africa to large parts of southern Africa (Loveridge & Williams 1957). The species occurs widely in the Republic of South Africa where it occupies a great range in habitats (Greig & Burdett 1976). They are common in the Mountain Zebra National Park (MZNP) which is situated about 27 km south-west of Cradock in the Cape Province.

As part of the overall management program for the area and because the species is frequently encountered during the normal course of duties, a study was undertaken during the period October 1979 to February 1982 to assess the status of the population.

### *Methods*

No special effort was made to locate tortoises and only those encountered by chance were used in the study. Individuals were marked by drilling small holes in the marginal scutes (using codes for numbers one to 100), sexed using the shape of the plastron, weighed on a spring balance and released at the point of capture which was recorded on a map. Subsequent recaptures were also recorded on maps and other aspects of their biology such as reproduction, mortality and behaviour were noted.

### *Results*

#### Marking, mass and sex ratio

A total of 69 tortoises were captured and marked of which 25 were females representing a male to female sex ratio of 1:1.75 which differs significantly from a 1:1 ratio ( $X^2=4.62$ ). A total of 55 were weighed consisting of 21 females with a total

mass of 255,6 kg ( $\bar{X}$ =12,17 kg, range 4,8-16,4 kg) and 34 males with a total mass of 355,7 kg ( $\bar{X}$ =10,46 kg, range 6,4-18,4 kg) with a mass distribution pattern as shown in Fig. 1. A large female with a mass of 22,4 kg was released in the Park during December 1981.

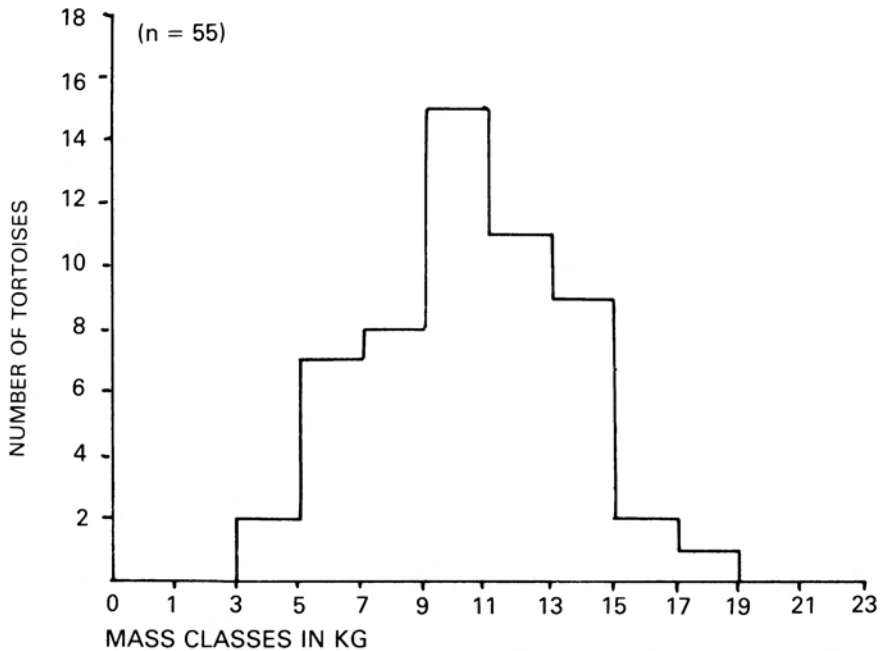


Fig. 1. Mass distribution of marked tortoises in the Mountain Zebra National Park, 1979-1981.

From October 1979 to May 1980 a total of 48 tortoises were marked, from June 1980 to May 1981 only 15 were marked and from June 1981 to February 1982 six were marked. By this time 75% of those encountered had already been marked. From these results it would appear that the total population is probably in the region of 100-150.

#### Mortality

Two large males were found floating in the Doornhoek dam having presumably drowned, and one was found dead with a badly cracked carapace. Damage to the carapace in adults, probably from slipping and banging against rocks is not uncommon and 24 (34,8%) of the marked individuals had some damage to the carapace. The large adults from about 9,0 kg upwards had smooth brown shells with little or no mottling or annulations on the scutes. At the Addo Elephant National Park (AENP) some 180 km to the south the adults retain the mottling and annulations. One adult had a large bag-like growth on one hind leg. This individual was marked in November 1979 and when next seen in August 1980 she still had the growth and appeared to be in perfect health.

No juvenile tortoises were encountered (smallest was 4,8 kg) which would indicate that this was where mortality was taking place. Alternatively, at the egg stage, and in this respect ten excavated "nests" were found with broken egg shells scattered around. There was no indication at any of these as to the identification of the predator.

### Reproduction

Mating was observed on seven occasions (three October, three November, one December) and laying on one occasion on the 18th April 1979 at 16h00 on Doornhoek dam wall. Ten pure white round eggs were laid about 10 cm below the surface and they had a mean measurement of 45,5 x 44,8 mm (47,5-42,9 mm). the female used the hind legs to dig in the soil which had been softened by an exude from the anal region.

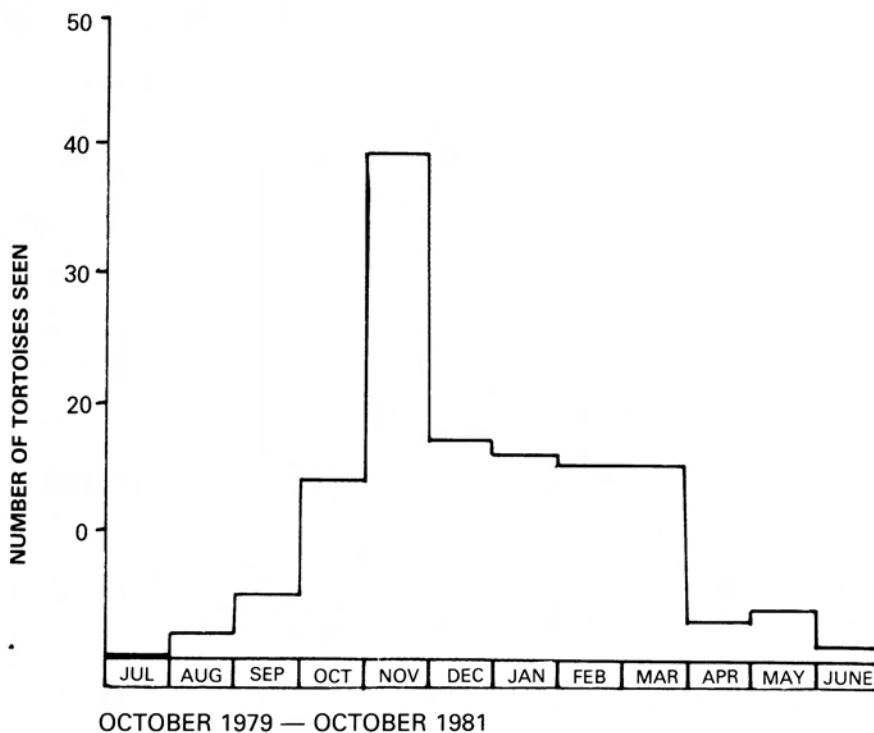


Fig. 2. Number of tortoises encountered on a monthly basis in the Mountain Zebra National Park during 1979 to 1981.

### Activity and distribution

The tortoises were most active during the warmer months as indicated in Fig. 2. The peak in November is slightly misleading as this was caused by ideal tortoise conditions in November 1979 when a record 33 were encountered during the month.

During the cold months the tortoises took refuge in dense undergrowth of trees and shrubs such as *Lycium* thickets and *Rhus glauca* bushes. No activity was evident at night although at the AENP one was seen foraging on a warm wet night.

Of the 69 marked individuals, 30 were relocated on at least one occasion. Most of these remained in an area of less than 2 km<sup>2</sup> while five showed movement (in a straight line) of three to five kilometres from the point of capture. The majority of the leopard tortoises in the MZNP were found along the Wilgerboom River valley, especially Doornhoek dam (Fig. 3). The valley provided green forage and a readily available supply of water for drinking.

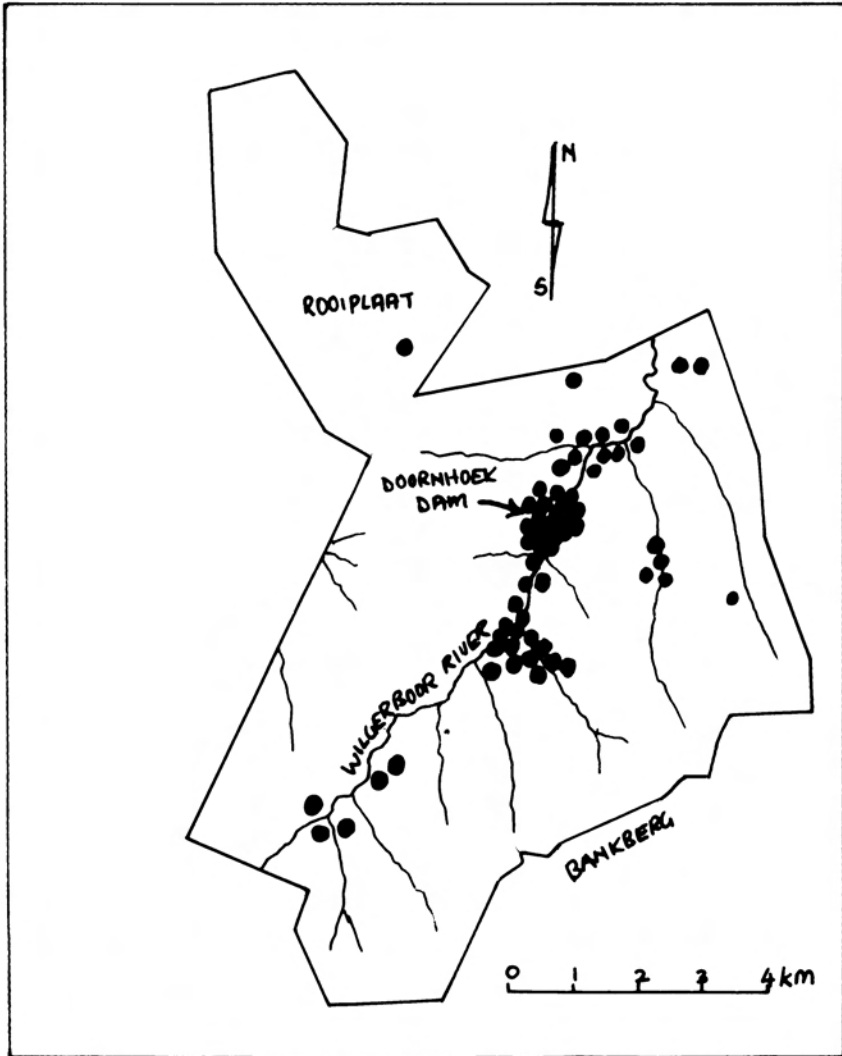


Fig. 3. Map of Mountain Zebra National Park showing capture sites of 69 individual leopard tortoises.

### Discussion

The number of large tortoises in the study area was not unexpected as this appears to be fairly typical of the Eastern Cape and at the AENP specimens of 18-20 kg are not uncommon. The largest of the species ever measured, the famous "Domkrag", came from the AENP and had an estimated mass of around 40 kg. Quite how they cope with temperatures of up to 40°C and higher is not fully understood as work done by Perrin & Campbell (1981) indicates that specimens of *G. pardalis* over 11,1 kg might face overheating problems.

What is of some concern in the MZNP is the lack of juvenile tortoises. It would appear that the nests are raided by an unknown predator. The only potential predators are the rock leguaan *Varanus exanthematicus* which will eat birds eggs (*pers. obs.*) and is adapted for digging. Wilson (1968) records this species as eating a 47 g *G. pardalis* while Wilson (1965) mentions a captive puffadder *Bitis arietans* swallowing a "baby" tortoise of the same species. These snakes are common in the MZNP but it is unlikely that they will cause a significant mortality of young tortoises.

Two tortoises in the study area were taken from the field to the research laboratory, marked and released. Both returned to the capture site some 2 km away. The strong homing instinct of the leopard tortoise was demonstrated by Bertram (1979). In conclusion it can be said that the leopard tortoise population in the MZNP consists largely of adults and that there appears to be some form of pressure being exerted on the eggs or juveniles which may be detrimental in the long term.

### Acknowledgements

I would like to thank members of staff in the MZNP who assisted in relocating marked animals and reporting their presence.

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