CHAPTER 1: INTRODUCTION

PERSPECTIVE

Within the cat group as a whole, the leopard is in many respects the archetypal felid, and stands at the opposite end of the spectrum from the cheetah, Acinonyx jubatus (Kleiman & Eisenburg 1973). The leopard is the largest of the spotted cats in Africa. Skinner & Smithers (1990) give the average mass of male leopards and that of females from Zimbabwe as 59,7 kg and 31,5 kg repectively. While for leopards in the Cape Province, Stuart (1981) gives an average weight of 30,9 kg for males and 21,2 kg for females.

In the Waterberg twelve leopards weighed an average of 58,8 kg (range 52,8 - 64,1 ; n=6), for males and 34,9 kg (range 29,2 - 41,0 ; n=6) for females (Table 1).

The leopard is the most widely distributed of all the world's cats (Weigel 1975), due to a wide habitat tolerance. While they generally associate with areas of rocky koppies, rocky hills, mountain ranges and forests, they also occur in suitable habitat in deserts, living along the fringes or penetrating watercourses (Skinner & Smithers 1990). They therefore range over most of Africa and much of Asia (except for the Arctic Tundra area), as far to the north and east as Manchuria and Korea (Hamilton 1981). They can exist in zones with as little as 50 mm rainfall (Monod 1965), obtaining moisture from their prey. The only habitat in sub-Saharan Africa with which the leopard is unable to cope, is unvegetated sand dunes.

At the other extreme, they can exist satisfactorily in the alpine zone of the East African mountains (Brown 1971). They are found from sea level to over 5000 m (Mt Kilimanjaro) and they occur in areas of mean annual rainfall of over 2000 mm (West Africa). Cover to lie in safely during daylight hours, and from which to hunt, is an important requirement. In areas of intense development, providing there is adjacent cover provided by rocky hills or forest, they manage to persist even in the face of intense control.

Because of it's secretive, solitary and largely nocturnal habits, it has been one of the last mammals to yield to scientific study. Until the spoor tracking study of Smith (1977) in Zimbabwe and the radio-tracking studies of collared leopards in Tsavo and Meru National Parks (Hamilton 1981) and the Serengeti National Park, Tanzania (Bertrum 1978), almost all recorded information on leopard ecology appeared in popular and semi-popular literature, most of which Turnbull-Kemp (1967) has summarised. In recent years Norton & Lawson (1985) and Norton & Henley (1987) published data on leopard movements (Cape Province), while le Roux & Skinner (1989), reported on aspects of their ecology in the Transvaal Lowveld. Bothma & le Riche (1984;1986), also contributed data from the southern Kalahari.

Recognizing man's influence, on leopard mortality and thereby on the social organization of a solitary carnivore, as well as the impact of these carnivores on the assets of man, is extremely important in any conservation plan. Research on unexploited long standing populations in different habitat types is essential to establish the intrinsic "norms" for a given

species. Knowing the "norms", provides a tremendous advantage in recognizing what is going on in exploited populations (Hornocker & Bailey 1986).

In highly evolved intelligent species such as cats, we can expect different behaviour from different populations, as behaviour is wholly dependant on extrinsic and intrinsic factors. Rather than emphasizing "conflicting" data from different populations and regions, we should recognize the flexibility inherent in the species and it's ability to adapt.

PRIMARY OBJECTIVES

The prime objectives of the present study were to examine the following aspects of leopard ecology in the Waterberg.

a. Leopard space utilization and activity patterns.

b. The leopard's diet relative to prey abundance, together with related aspects such as capture and feeding behaviour, especially pertaining to domestic livestock.

c. Different aspects of leopard translocations, particularly the relevance thereof in a leopard conservation strategy.

d. A conservation strategy for leopards in farming areas of the Transvaal with special reference to stock protecting measures.

TABLE. I

Overall measurements (mm) and mass (kg) of leopards captured in the Waterberg (1985 - 1988).

	MALES			FEMALE		
	X	n	Range	X	n	Range
TL	2175	5	2070 - 2220	1852	6	1840 - 1870
HB	1378	5	1300 - 1420	1158	6	1130 - 1200
T	798	5	740 - 850	695	6	640 - 740
Hfs/u	254	5	240 - 265	229	6	210 - 250
Ear	70	5	62 - 74	62	6	58 - 70
Neck	500	5	490 - 510	379	6	360 - 400
Canines:						
Upper	34	5	30 - 36	29	6	24 - 30
Lower	29	5	28 - 30	23	6	20 - 25
Mass	58,8	6	52,8 - 64,1	34,9	6	29,2 - 41,0

DESCRIPTION OF STUDY AREAS

Location

Melk River :

This area is located in the Waterberg mountain range of the north west Transvaal, R.S.A, and comprised private cattle and/or game farms. Some cropfarming occurs along the banks of the Palala river. The game farm Sliedrecht (23° 58'S, 28° 15'E) formed the centre of the study area which is approximately 50 km south west of Melk River and 50 km north west of Vaalwater (Fig. 1).

Naboomspruit :

Also located in the Waterberg mountain range, but more in the central northern Transvaal, this area is also comprised of private cattle and/or game farms with some cropfarming especially in the Sterk River Settlement area. The Doorndraai Dam Nature Reserve (TPA) formed the centre of the study area (24° 20'S, 28° 45'E). This reserve lies 45 km south west of Potgietersrus and 50 km north west of Naboomspruit (Fig.2).

Topography and Geology

Melk River :

The area is situated at the north eastern periphery of the Waterberg plateau. This region forms a highland area with an altitude between 1100 m in the north west and almost 2100 m in the south west.

Figure 1 : Topographical map of the Melk River study area (Scale 1 : 250 000).

The main escarpment stretches from Warmbaths, extending northwards forming a rugged territory, the centre of which is called the Palala plateau. The plateau surface declines gradually to the west where a well defined scarp overlooks the peneplain of the Upper Limpopo Valley. The south escarpment ends at the Sandrivierberg (Wellington 1955).

Quartzilic sandstones are common in the region and occur in thick beds which are often pebbly or gritty. Both the sandstones and conglomerates have a red colour which is doubtless in great part due to the amount of felsitic and other ingenous debris present in the original sediments as well as to oxidizing conditions during or after deposition. Coarse conglomerates, with occasional breccias mark out the base, though occurring higher up as well and many range from 33 to 130 m in thickness (Du Toit 1954).

Several perennial rivers have their source within the undulating hills that comprise the Waterberg plateau. Five drainage systems have been classified for the Waterberg group (Anon 1984). The Sand river to the north and the Crocodile river to the south are the most important. The Palala river that runs within two km north of the study area is classified amongst the five main drainage systems of the region. The main stream in the area is the Blockland spruit that drains into the Palala river.

Naboomspruit :

The Sterk river runs through the study area into the Doorndraai Dam. This dam with a surface consisting of 600 ha provides irrigation water to the nearby Sterk River Settlement.

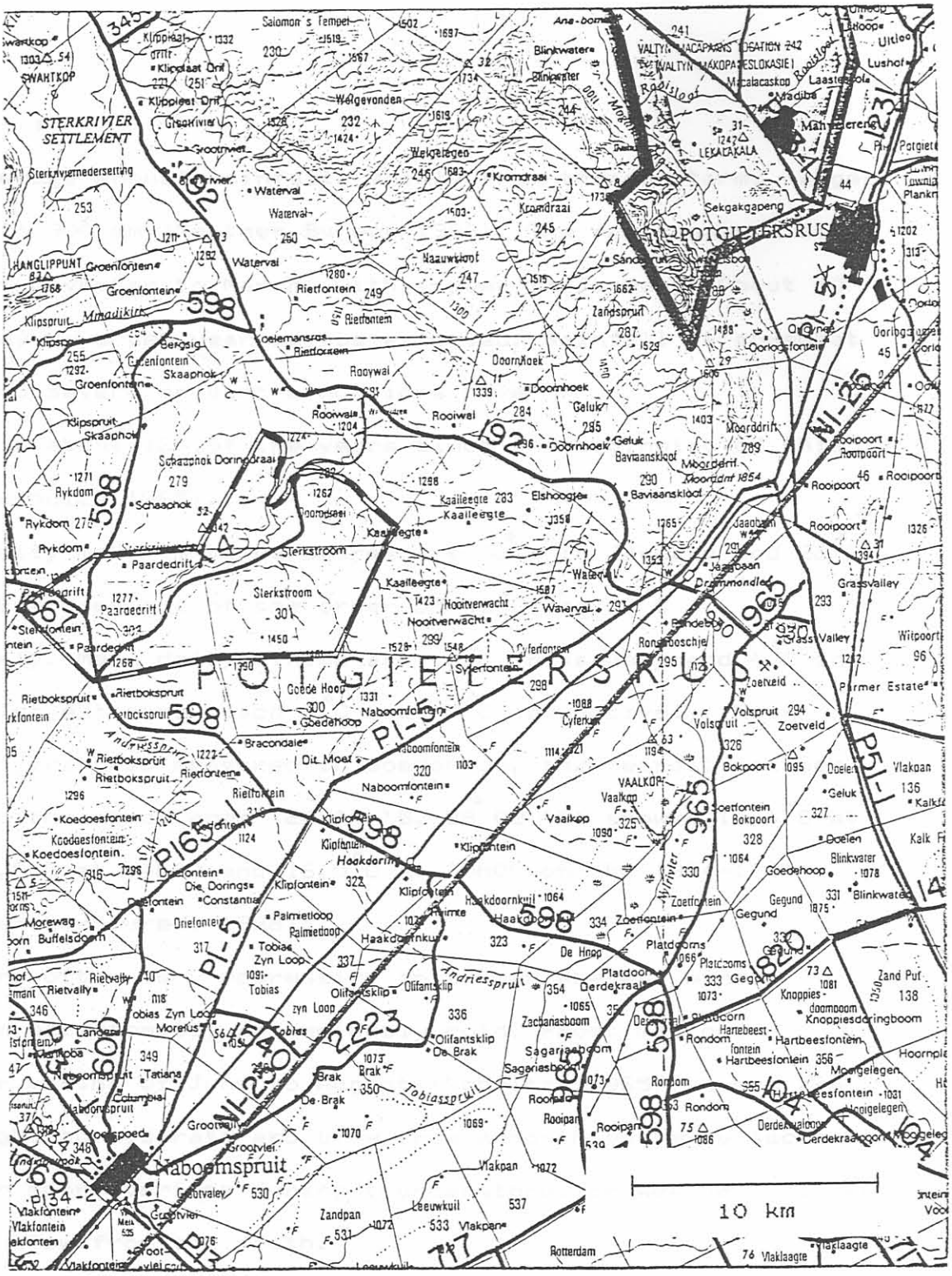

Figure 2 : Topographical map of the Naboomspruit study area (Scale 1 : 250 000).

Climate

Melk River :

The average annual rainfall, mainly from thunderstorms ranges from 630 to 900 mm (Weather Bureau 1986). The rainy season lasts from about November to March, with a peak in January. About 50 to 80 rainy days per year may be expected. Rainfall is somewhat erratic and severe drought conditions have occurred in about 12% of the years since the beginning of this century (Schulze 1965).

Mean daily maximum temperatures are 32 °C in January and 22 °C in July. Extremes are of the order of 42 °C and 32 °C respectively. Mean daily minima are 18 °C in January and 4 °C in July, whilst extremes reach 8 °C and -7 °C respectively. Mean annual temperatures measured in Goedehoop, the nearest weather station to the study area (24° 14 'S, 28° 02 'E) showed 14,4 °C at 08h00, 25,0 °C at 14h00 and 16,0 °C at 20h00 on the 1974-1982 period (Weather Bureau 1986).

Days are often very oppressive in summer whereas winter nights can occasionally be decidedly cold. Frost may occur during the months of June to August (Schultze 1965). Winds are mainly light to moderate and blow from a north easterly sector except for short periods during thunderstorms or weather changes when they blow from the south.

Naboomspruit :

The average annual rainfall from 1976 - 1990 is given as 570 mm (Odendaal. pers comm)*. The rainy season lasts from about

November to March, with a peak in January. Mean daily maximum temperatures are given at 30,8 °C in January and 18,0 °C in July for Doorndraai Dam Nature Reserve. Mean daily minima temperatures are 17,0 °C in January and 3,4 °C in July whilst extremes reaching 39,0 °C in summer (January) and −3 °C in winter (July).

Vegetation

Melk River and Naboomspruit :

The Sour Bushveld is typical of the Waterberg area and is recognised at community level (Acocks 1975). The vegetation conforms to moist savanna, although some of the more abundant floristic components relate the region to the arid savanna and include Acacia spp., Commiphora spp. and Aristida spp. (Huntley 1982). Generally however, the availability of water, which is the main determinant of the distribution of moist and arid savanna biomes, classifies a region that receives more than 650 mm annual rainfall as a moist savanna (Huntley 1982).

* G. Odendaal
Chief Directorate of Nature and Environmental Conservation
Private Bag 209
Pretoria
0001

Classifying an area as sourveld indicates that the nutritive value of grass deteriorates rapidly as it lignifies. The vegetation is comprised of a catena of tall closed non spinescent mesophyllous deciduous woodland and open drainage-line grasslands. The herbaceous productivity is usually high and dominated by tall perennial mesophytic grass species (Huntley 1984).