

Chapter 1

INTRODUCTION

Grey rhebok (*Pelea capreolus*) and southern mountain reedbuck (*Redunca fulvorufula fulvorufula*) are two similar sized and similar looking antelope species found in South Africa. Both use rocky hillsides and mountain slopes that form marginal habitat for most other ungulate species as well as domestic livestock. In many areas of South Africa they are sympatric (Figure 1).

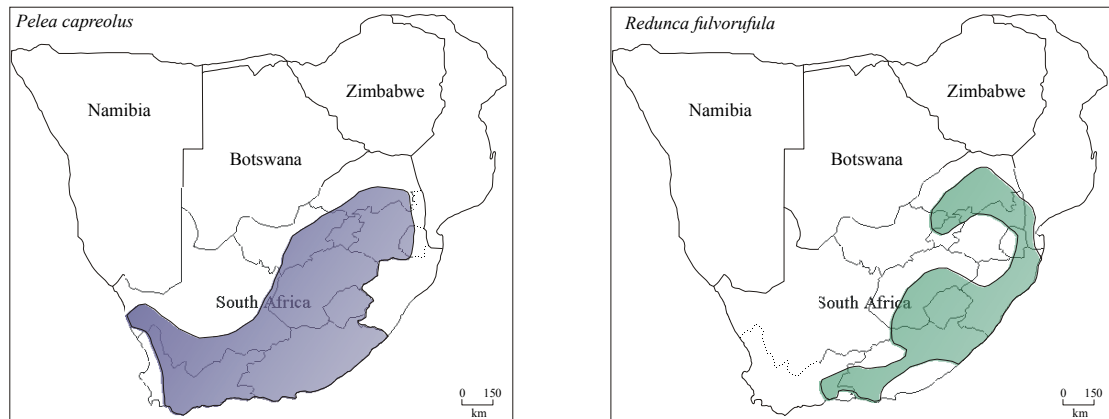


Figure 1. The geographic distribution of grey rhebok and southern mountain reedbuck within South Africa.

The favoured habitat of grey rhebok is steep grassland at high altitudes (Rowe-Rowe, 1983, 1994), where they feed selectively and almost entirely on forbs (Ferreira & Bigalke, 1987; Beukes, 1988). Only two social groups have been recorded, these being solitary males and harem herds (Esser, 1973; Ferreira, 1983; Beukes, 1984), while bachelor groups have not been observed. Harem herds are small, numbering up to 12 individuals, and comprise one adult male, several females and accompanying young.

The living requirements of mountain reedbuck are also steep grasslands (Rowe-Rowe, 1983, 1994), where they are selective grazers, feeding only on certain grass species (Irby, 1976). Social organisation consists of territorial males, non-territorial males, female herds with young, and bachelor groups (Irby, 1976; Skinner & Smithers, 1990). Female herds are normally small, comprising 3-8 individuals in unstable groups that change size and composition frequently. These females regularly move between territories of different males (Irby, 1976; Dunbar & Roberts, 1992).

The present study was conducted within a research theme at the Faculty of Veterinary Science that was aimed at the improvement in quality of life for local disadvantaged communities. These people were intended to be the recipients of reduced meat prices under the South African Governments Reconstruction and Development Program (RDP). Improving levels of production of game species would logically be beneficial to this scheme, so one of the goals of the present study was to increase ecological and biological knowledge of mountain reedbuck and grey rhebok that could be used to improve management practices related to productivity. This would not only benefit such RDP schemes, but also private game farmers and Nature Reserve managers that are involved in hunting and ecotourism ventures.

The game ranch and ecotourism industries in South Africa have been expanding rapidly over the past decade, and are predicted to continue growing at a fast rate (Rudder, 2000). Although there has been a vast amount of research conducted on wildlife within southern Africa in the last 50 years, which has resulted in the acquisition of considerable knowledge for application to game management, there is still a need for increased knowledge of individual species ecology for areas and species where this knowledge is lacking. Game ranching and ecotourism seek optimal use of space by antelope species because there is a lot of money to be made in hunting, sale of live animals, and game viewing. The more animals that can be removed in a sustainable manner, the higher the financial return, while tourists generally want to see as many animals as possible within a given time.

Optimising management practices requires sound knowledge of a wide range of biological and ecological factors including the following:

- 1) Optimal stocking/population densities. This is affected by social structures, home ranges and territory sizes, as well as resource availability and carrying capacities of the habitat;
- 2) Reproductive patterns. This is important because there are periods in the year when cropping animals would be counter-productive (e.g. removal of pregnant or lactating females would result in the loss of foetuses or young as well, and this would reduce the population growth rate);
- 3) Population dynamics. Knowing when changes in populations normally occur allows removal of animals before they are lost naturally (whereby they provide no income), and knowing the causes of change allows possible prevention of losses;
- 4) Seasonal variation in body condition. This is useful to assess the time of year when animals will provide the most meat.

Both grey rhebok and mountain reedbuck are popular game ranch species, and are increasingly being sold at game auctions and translocated between nature reserves and other game areas. In most cases, however, only a limited amount of ecological knowledge, such as habitat suitability or social structure, is put into practice when moving game between different areas. Home range and territory requirements are generally not considered, while male spacing patterns and hierarchies are often ignored. Considerable time and money invested in new animals intended for increased genetic variability would be wasted if there were not enough resources and space for them, while the success of translocations would increase if species ecological knowledge was better known and put into practice.

Mountain reedbuck are commonly hunted for trophies and meat/biltong production, and could potentially provide a considerable secondary form of income in both game and domestic livestock areas where there is marginal habitat that is not optimally utilised. Moreover, they could do this without competing with other antelope species or domestic livestock for precious grazing resources. In contrast, grey rhebok are hunted primarily for trophies, while their flesh is generally not sought after because of

a perception that it is not good to eat and is often riddled with worms (Skinner & Smithers, 1990). Although optimising meat production output is unlikely to be important in the management of this species in the future, good ecological information is still needed for more efficient trophy hunting and ecotourism practises.

Relative to some other South African antelope species, such as impala (*Aepyceros melampus*) and springbok (*Antidorcas marsupialis*), grey rhebok and mountain reedbuck have not been as extensively studied. Of the latter two, mountain reedbuck have been studied most, with Irby (1975, 1976, 1979, 1981, 1982) reporting on aspects including growth and ageing, meat production, reproductive patterns, population parameters, habitat requirements and use, and potential population controls. Norton (1989) comprehensively covered the population dynamics of mountain reedbuck by examining population census data, cull figures, reproduction, age structure, recruitment and mortality. Roberts & Dunbar (1991), and Dunbar & Roberts (1992) investigated territory quality and activity patterns of Chanler's mountain reedbuck (*Redunca fulvorufula chanleri*) in Kenya. Despite these wide-ranging investigations, some aspects were not covered in great detail, and there still remain gaps in knowledge.

Grey rhebok ecology is less well known, but aspects that have been investigated include habitat requirements (Beukes, 1984), feeding behaviour (Ferreira, 1983; Beukes, 1984, 1988; Ferreira & Bigalke, 1987), body condition (Beukes, 1984) and a few other lesser aspects of their biology (Esser, 1973).

AIMS

The primary aim of the present study was to investigate factors that influence productivity in grey rhebok and mountain reedbuck that might be useful in management practices. These factors were broken down into five categories, all of which were considered important for understanding productivity. There are other aspects of ecology that are relevant to this topic, but these were not within the scope of the study. The five categories were as follows:

- 1) **Population dynamics.** Knowing how and why population's change with time is a critical part of understanding and potentially exerting some control over productivity. It is also important for the management of free ranging populations. Population dynamics studies generally investigate rates of increase and decrease in population size, but rarely find or even look for the causes of changes resulting in deaths. Predation may be considered, but disease and parasites generally are not, even though these factors can exert dramatic influences (Wilson *et al.*, 2002). Understanding the causes of animal losses in more detail would have obvious benefits for managing populations because of the possibility of using the knowledge to improve survival rates;
- 2) **Home ranges/territories.** Knowing spacing patterns and area requirements of animals is important when managing population sizes and stocking densities. Although home ranges of both species have been determined before, they were not investigated rigorously, while the present study allows a comparison between the two in an area where they occur together;
- 3) **Behaviour.** There is a connection between behaviour and productivity whereby the time spent feeding is correlated with the amount of food eaten, which in turn is correlated with body condition (assuming constant food supply and quality). Seasonal changes in veld condition are well documented, so the main purpose of the behavioural study was to investigate seasonal differences in feeding behaviour and compare this with known veld condition variation. Additionally, due to the differences in food types of the two species, there should be differences between them in time spent feeding;
- 4) **Body condition.** Mountain reedbeek are cropped for meat and biltong production, and may be marketed to a limited extent at subsidised prices to disadvantaged communities. Little is known, however, about their meat production potential and how this varies seasonally. With the other investigations being conducted concurrently during the present study, the additional information provided by a seasonal index of body condition can be used in the analysis of population dynamics;

- 5) ***Endoparasites***. Endoparasites can have significant affects of the health of animals (Wilson *et al.*, 2002), either by competing for ingested nutrients within the gastro-intestinal tract (GIT), or by causing disease. Moderate endoparasitic infections can reduce productivity, while extreme loads may prevent reproduction and even kill animals. The endoparasites of mountain reedbuck have been investigated to a limited extent (Irby, 1976; Boomker *et al.*, 2000), but only by looking at species occurrence (no seasonal effects were searched for), while the effect of parasite loads on productivity were not considered. Endoparasites of grey rhebok are less well known (Boomker & Horak, 1992).

The intention of the present study was not only to investigate productivity separately in the two species, but also to make comparisons between them. This was done in the population dynamics, home range and behaviour sections. Unfortunately, while mountain reedbuck were culled during the study, grey rhebok were not, so body condition and endoparasitic loads were only investigated systematically in the former, while investigations of parasites in grey rhebok were confined to a small number of carcasses from natural mortalities.