

Chapter 1. Introduction

Wildlife management is, according to Gilbert & Dodds (1992), an unprecise science if it is compared to classical pure science such as physics and chemistry (Pauw, 1989). It is therefore rather looked upon as a skill, which Bailey (1984) describes as the art of making the land produce populations of wildlife for harvest or other value. These values include eco-tourism, scientific studies and protection of endangered species.

South Africa's natural resources are coming under increasing threat as a result of the inevitable utilisation thereof, and a competition for space (Bothma, 1986), which is the net result of the increasing human population of the world. Game farms that are managed efficiently and correctly, play an important role in wildlife conservation in South Africa, and provides an alternative resource that can be utilised. To manage a game farm effectively ecological limits and principles have to be taken into account (Bothma, 1986).

The concept of plant communities is an important facet of the management of a game farm. A plant community can be defined as a group of plant species that constantly occur together in a specific environment. Each plant community has a specific plant species composition which exists under specific environmental conditions (climate, geology, topography, soil,

drainage, herbivory) (Bredenkamp & Van Rooyen, 1994), and can therefore be regarded as an ecosystem. Each plant community has its own production and utilisation potential, and provides its own unique set of niches. Each plant community also reacts differently to environmental disturbances such as grazing and browsing, or burning (Bothma, 1986). As a result of this, particular communities could be damaged or degraded more easily than others. Specific herbivores also show distinct preferences for certain plant communities within a specific region, spending most of their time and energy utilising these areas (Dankwerts, 1989). This leads to the over-utilisation of these more preferred areas, and to the under-utilisation of the less preferred areas. Plant communities and their associated habitats therefore form the basis of scientific veld management, and therefore this aspect formed the basis of this study.

The Bynespoort Game Park consists of various distinctly different plant communities (Bredenkamp & van Rooyen, 1994), which offer a variety of habitats for the ungulate species on the Game Park, resulting in a high diversity of life occupying the area. These ungulates mainly utilise their resources by:

- Grazing - Where grass is the primary source of food, and
- Browsing - Where leaves and twigs of trees and shrubs are eaten.

As utilisation preferences of the ungulate species are known, stocking rates can be manipulated according to the type of plant communities present, the condition of the veld and the resulting carrying capacity of the veld under a

specific rainfall regime. By applying this knowledge in a wildlife management plan, a Game Park such as Bynespoort Game Park can be managed efficiently to be as self sustainable as possible by producing optimal numbers of game without degradation of the vegetation as primary natural resource.

Coetzee (1993) did phytosociological studies in the area and identified similar communities to this study. In this study the woodland communities: *Acacia caffra* - *Euclea crispa* woodland, *Burkea africana* - *Faurea saligna* closed woodland, and *Burkea africana* - *Englerophytum magalismsontanum* open woodland were very similar to some found in this study of Bynespoort Game Park. There were various other similarities with the study of Coetzee (1993), for example the presence of the *Themeda triandra* - *Setaria sphacelata* grassland community within the grassland area, and the *Leersia hexandra* - *Phragmites australis* wetland areas.

Bynespoort Game Park is the property of Premier Mine, a diamond mine owned by De Beers Consolidated Diamond Company.

Because of the large scale destruction that mining brings about, especially open cast mining, mining companies have become aware of their effects on the environment (Hacking & Nicholls, 1995), and they have consequently become actively involved in the protection of the natural environment by applying environmental management to their mining operations. This reduced the destructive effects to a certain extent. By declaring a Game Park, where the natural environment of the specific area can be conserved,

mining companies contribute to the conservation of the natural environment.

The creation of these islands of natural environment surrounded by human developments necessitated the development of specialised wildlife and environmental management plans to ensure maintenance of the natural ecosystems, combined with optimal and environmentally viable utilisation.

The specific aims of the study are the following:

1. To conduct a vegetation survey of the Bynespoort Game Park, and identify the different plant communities on the Game Park;
2. To conduct a structural analysis of the woody plant layer of the Bynespoort Game Park;
3. To determine the grazing and browsing capacity of the different plant communities of the Bynespoort Game Park;
4. To use all of the assembled information to recommend a stocking rate of ungulates for the Bynespoort Game Park, which will be able to sustain itself without placing stress on the environment.



Fig 1: 1: 50 000 Topographical map of the Bynespoort Game Park