



These two photographs were taken within 2km of each other in the Queenstown district, on the same day, in November last year. The difference in the landscape dramatically illustrates the consequence of mismanagement of grassland, which has resulted from injudicious land re-distribution. The top picture is of well-managed, productive, privately owned grassland, supporting profitable cattle herds. At the bottom is identical grassland that has been redistributed to emerging farmers without their being given any guidance or supervision. It was grossly overstocked and is now irretrievably degraded and is incapable of supporting livestock. The result is the destruction of an entire eco-system. Moisture-retention capacity has been drastically reduced and the area is now vulnerable to both water and wind erosion, exacerbating the degradation.

GRASSLAND

Five centres of endemism have been identified within the grassland biome and it contains a diverse range of different plant species making it important for wildflower conservation, writes **Cameron McMaster**.



- If grassland is not properly managed the biodiversity of it is compromised.
- There are 161 species of orchid in the grassland biome.
- Fire plays an important role in grassland ecosystems.



MANY PEOPLE HAVE BEEN ON journeys through the vast grasslands of the eastern regions of South Africa, probably without noticing them. Livestock farmers dependant on grassland for their cattle and sheep are so much more aware of the vegetation, especially if their aim is sustainable management of it.

However, very few seem to realise how important grassland is as a repository of biodiversity and as ground cover, which prevents runoff and so allows the sometimes meagre rainfall to penetrate into the deeper layers of soil and prevent soil erosion.

The role of grassland

Well preserved grassland is more productive and supports a diverse range of plant species. Not only the different species of grass, of which there are many hundreds, but also shrubs, perennial herbs, succulents and geophytes (plants such as bulbs and corms). It has been estimated that on a 100²m plot, of high altitude grassland in the Eastern Cape or KwaZulu-Natal, there can be between nine and 39 different species of plant. Many wild flower species are endemic

to grassland and therefore vulnerable. Five centres of endemism have been identified within the grassland biome. They are Drakensberg Alpine, Wolkberg, Barberton, Sekhukhune and the Soutpansberg.

Only the first two fall completely within the grassland biome. For a study of these biomes see *Regions of Floristic Endemism* by van Wyk and Smith, 2001.

The Drakensberg Alpine Centre has over 330 endemic species. All but a few of them aren't grass, for instance orchids and geophytes. There are 161 species of orchid within the grassland biome, 67% of which are endemic. Even in grassland outside of these main centres of endemism, many endemics occur. This illustrates the high species diversity of grassland and its importance for wildflower conservation.

A large group

The grassland biome in SA stretches from the inland areas of the south eastern and eastern seaboard, across the rolling hills of the Eastern Cape and KwaZulu-Natal, over the high mountain ranges of Lesotho and the Drakensberg, to the plains of the Free State and the Highveld of Mpumalanga. It falls almost entirely in the summer rainfall zone.

Woody plants are rare, except in rocky outcrops, ravines and watercourses. In the recently published book, *The Vegetation of South Africa, Lesotho and Swaziland*, published by the South African National Bio-diversity institute in 2006, the grassland biome is subdivided into numerous vegetation units based on rainfall, temperature, altitude and soil type. From a practical point of view two main divisions are usually recognised by livestock farmers – sourveld and sweetveld. These broad division are based largely on annual rainfall.

Below 600mm the soil is more nutrient-rich and the plants are more palatable, even when dry. Above that rainfall level, the soils are generally leached and the grass is less palatable and coarser. There, less nutritious, sourgrass dominates according to the corresponding decrease in temperature, higher rainfall and generally a higher stocking capacity.

The role of fire

Fire has been a natural phenomenon that has shaped the evolution of grassland

and serves to maintain it in a stable state. Plants that occur in grassland are fire tolerant and sometimes fire dependent.

Most are re-sprouters after fire. The absence of fire results in the build-up of moribund plant material, which inhibits flowering, seed production and new plant establishment. However, the frequency of fires and the management regime following fires has a profound influence on the condition and productivity of grassland and the effect of this needs to be understood.

Fires occur naturally at intervals of between one and four years. They normally occur in late winter and spring and are followed by spring rains and a growth flush leading to the reproductive stage of the plants. After seeding the plants translocate reserves to the crown and roots in preparation for dormancy and

'Vast tracts of grazing land have been destroyed in less than a decade and have been rendered totally unproductive.'

the next cycle. Continual defoliation by grazing too soon or too heavily, after a burn, disrupts the cycle and weakens the plants. This results in a rapid decline in the vigour and productivity of the sward. Controlled fires at intervals of four years or more, followed by judicious grazing management after a burn, are required to maintain the grassland in good condition.

The time of a burn also has a profound influence on plant growth and behaviour. Spring burning followed by spring rain stimulates flowering of grassland species. Autumn burning prevents the plants from restoring their crown and root reserves and, followed by a long dry winter, the ground is bare for months which results in high evaporation and desiccation.

Land use and threats to grassland

Because of the important commercial activities that take place on grassland, such as agriculture, livestock production, forestry, mining, urban development and so on, nearly 60% of the area has been permanently transformed and much of the remaining area is still being transformed. Only about 15% of the natural grassland is still in a natural state and this is

highly fragmented. Only grassland in reserves such as national parks can still be regarded as pristine and containing the original biodiversity.

A mismanaged resource

There are various threats to grassland including poor utilisation management when it comes to grazing domestic stock, incorrect burning practices and excessive grazing pressure, and the spread of alien vegetation such as the black wattle.

Grazing has a major influence on structure and species composition. It's generally accepted that on communal tribal areas, grazing pressure can be three to four times the recommended rate for commercial livestock farming. This has led to massive degradation, loss of species, an increase in unpalatable species and a loss of production, all of which exacerbate the poverty in these areas.

One of the tragedies of modern political engineering in South Africa, by both the previous and present regime, is the consequence of land re-distribution. Vast tracts of productive grazing land have been destroyed in less than a decade and have been rendered totally unproductive to the extreme detriment of the economy and particularly the people now occupying the land.

According to the Red Data List (Hilton-Taylor, 1996) the grassland biome contains 640 red list species of which 136 are threatened with extinction and six are already extinct. It's only through an awareness campaign that individual landowners could be alerted to the crisis and motivated to apply conservation measures and management systems that could preserve bio-diversity, at least on the land for which they are presently responsible.

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Further reading:

Some of the information contained in this article was obtained from a highly-recommended publication, *The Vegetation of South Africa, Lesotho and Swaziland* edited by Mucina and Rutherford and published in 2006 by the South African National Bio-diversity Institute.