

Grassland species are particularly well adapted to being defoliated, whether by grazing, fire or frost. Repeated defoliation, within reason, does no real harm to such plants nor does it reduce productivity. The palatability of grass and its value as food for livestock increases with decreasing rainfall, which is also correlated with altitude. In grazing terms, this corresponds to Sourveld in the moist highveld and sweetveld in the dryer lowveld. This grass palatability gradient extends from grassland into savannas. Although sweetveld grasses produce less biomass than sourveld grasses, they have higher food value and lower fibre. This means the plant nutrients are more available in lower rainfall areas due to less leaching of the soil by high rainfall. The 650mm rainfall isoline approximately separates these two livestock zones. Fire is a characteristic feature of grassland (and savannas) and is a necessary component of good land management. Grassland plants depend on fire, they resprout annually from their root-stocks. Without frequent fire, grasslands eventually become invaded with woody species and some herbaceous plants disappear. Regular burning complements good grazing management and helps to prevent the increase of unpalatable species, including woody species that form bush encroachment.

A reason for concern is the extensive commercial forestation over large areas of land in the high rainfall eastern Escarpment area, a region of exceptionally high biodiversity, which contains 30% of the endemic and rare plant species of the former Transvaal Province. While it is too late to bring back the large migratory herds of grassland herbivores, it is imperative that the existing reserve network be maintained and expanded to conserve viable populations of South Africa's unique grassland species. The first step is to alert the South African public to the fact that a hitherto disregard heritage is slipping away. Warwick Tarboton, an eminent South African ornithologist, expressed it succinctly:

'If ever a biome needed a champion, it is the grassland'

8 THE BIOPHYSICAL ENVIRONMENT

8.1 Location

The 8km radius (study area) is situated around the Tutuka Power Station, Mpumalanga Province. The proposed site is located on Eskom owned land on the farm Spioenkop 375. Other farms situated within the 8km radius include Villierschrik 338, Recesbult 352, Uitkyk 339, Meyersvallei 334, Honiball 351, Slagkraal 353, Liebenberg 345, Papkuilfontein 346, Dwars-in-die-weg 350, Rouxland 358, Pretoriusvley, 374, Eensgevonden 373, Welbedacht 382, Niekerksvley 380 and Uitkyk 377. The study area is situated approximately 25km northeast of Standerton and 35km southeast of Secunda. A general GPS point for the preferred site is S26.78196° and E29.40385°.

The regional location of the study area is illustrated in Figure 1. A composite Google Earth image is presented in Figure 2, reflecting a relatively high habitat fragmentation of the general region because of an intensive road and railway infrastructure.

8.2 Land Cover & Land Use of the Region

Land cover categories are presented in Figure 3. For the purpose of this assessment, land cover are loosely categorised into classes that represent natural habitat and categories that contribute to habitat degradation and transformation on a local or regional scale. In terms of the importance for biodiversity, the assumption is that landscapes exhibiting high transformation levels are normally occupied by plant communities and faunal assemblages that do not necessarily reflect the original or pristine status. This is particularly important in the case of conservation important taxa as these plants and animals generally exhibit extremely low tolerance levels towards disturbances. This is one of the main reasons for the threatened status of these species. Changes in the natural environment available to these species are therefore likely to result in severe impacts on these species and, subsequently, their conservation status.

Three important aspects are associated with habitat changes that accompany certain land uses. Permanent transformation of natural habitat by land uses such as agriculture, mining and urbanisation results in the permanent decimation of available habitat as these areas will not recover to the original pristine status. A second aspect of habitat transformation or degradation is that it affects species directly, namely changes in species presence/ absence and –composition. This result from the exodus of species for which habitat conditions have become unfavourable, the decrease in abundance of certain species because of decreased habitat size, or an influx of species that are better adapted to the altered environment. While some, or most, of the new species that occupy an area might be indigenous, they are not necessarily endemic to the affected area. Lastly, a larger threat to the natural biodiversity of a region is represented by the influx of invasive exotic species that can effectively sterilise large tracts of remaining natural habitat.

The study area is situated within the Lekwa District Municipality, which comprises a total of 458,519ha. The BGIS (2007) assessment indicates that approximately 63.8% of the municipality are currently considered untransformed. This figure is however regarded an overestimation of the true extent of remaining natural (pristine) grassland habitat in the region. This statement is based on the following:

- The current land cover, as presented in ENPAT does not accurately reflect the current land cover status in all instances; in particular, recent agricultural activities and localised stands of exotics are not captured within the existing data (pers. obs.); and

- It is well established that the status of much of the remaining portions of 'natural grassland' is not accurately summarized in the assessment. These 'natural grasslands' frequently comprehend poor quality grassland or even pastures that exhibit severely altered species compositions and depleted diversity that does not reflect the natural grassland of the region (pers. obs.).

By inclusion of portions of land cover categories that do not reflect the natural status of the ecological environment, with particular reference to sub-climax grassland types, in the category of 'Natural Grassland' a fallacious view is created of the extent of remaining natural habitat in the region. It is therefore extremely likely that remaining untransformed habitat within the municipality is much lower than initially anticipated. Ultimately, the greater region is characterised by high levels of habitat transformation, isolation and habitat fragmentation, resulting from persistent increases in mining and agricultural activities, urban developments, linear infrastructure and poor management practices.

Severity of impacts that commercial agriculture (maize production) has had on the natural environment are evident from the mosaical appearance of land cover in the immediate region. Limited natural habitat remains within the greater area, reflecting similar trends on a municipality and provincial level. These pockets of natural grassland are in a relative advanced state of fragmentation and habitat isolation and connectivity in some parts are low. Other limited land transformation effects result from industrial and urban development. Road and railway infrastructure in the region caused a high degree of habitat fragmentation and isolation (refer Figure 1).

8.3 Declared Areas of Conservation

Although no formally declared area of conservation is present within the 8km radius, two areas of conservation are present in the surrounding region, including (refer Figure 4):

- Bloukop (23km east); and
- Reitvaal (37km east).

These areas are unlikely to be affected directly by the proposed development.