



1.2 Botanical Assessment

The study site corresponds to the Grassland Biome as defined by Mucina & Rutherford (VegMap, 2006). This unit is found in the eastern, precipitation-rich regions of the Highveld. The following ecological types are represented within the 12km radius:

- Amersfoort Highveld Clay Grassland (Vulnerable);
- Bloemfontein Karroid Shrubland (Least Threatened);
- Eastern Temperate Freshwater Wetlands (Vulnerable);
- Soweto Highveld Grassland (Endangered); and
- Wakkerstroom Montane Grassland (Least Threatened).

The South African National Biodiversity Institute (SANBI) database [Plants of Southern Africa (POSA), 2012] indicates the known presence of approximately 390 plant species within the ¼-degree grids that are spatially represented in the study area. The high floristic diversity of the immediate region reflects the regional diversity context of the Grassland Biome. However, the paucity of accurate floristic species richness is indicated by the absence of some common plant taxa from the data records as well as the low species richness of certain ¼-degree grids. An appraisal of the growth forms reflects the diverse grassland physiognomy with 189 herb species, 74 grass species, and 45 geophyte species. The physiognomical dominance of the grassland biome is also illustrated by the absence of large trees and low diversity of shrubs (15 species). This species richness also represents 66 plant families, typically dominated by Poaceae, Asteraceae, Fabaceae and Cyperaceae.

Mpumalanga Province comprises 4,256 plant species of which 276 are included in the various conservation categories. Data records indicate the presence of the following plant species of conservation importance within the ¼-degree grids that are sympatric to the study area:

<i>Acalypha caperonioides</i> var. <i>caperonioides</i>	Data Deficient
<i>Argyrolobium campicola</i>	Near Threatened
<i>Crinum bulbispermum</i>	Declining
<i>Gladiolus robertsoniae</i>	Near Threatened
<i>Ilex mitis</i>	Declining
<i>Khadia alticola</i>	Rare
<i>Kniphofia typhoides</i>	Near Threatened
<i>Miraglossum davyi</i>	Vulnerable
<i>Nerine platypetala</i>	Vulnerable
<i>Stenostelma umbelluliferum</i>	Near Threatened

In addition to the species currently captured in the SANBI infobase (POSA, 2011), the following provincially protected plants are known to occur within the region of the study area (Mpumalanga Nature Conservation Act No.10 of 1998):

<i>Agapanthus inapertus</i> subsp. <i>intermedius</i>	<i>Eulophia foliosa</i>
<i>Aloe ecklonis</i>	<i>Gladiolus crassifolius</i>
<i>Corycium nigrescens</i>	<i>Gladiolus dalenii</i> subsp. <i>dalenii</i>
<i>Crinum bulbispermum</i>	<i>Gladiolus permeabilis</i> subsp. <i>edulis</i>
<i>Cyrtanthus breviflorus</i>	<i>Gladiolus robertsoniae</i>
<i>Cyrtanthus tuckii</i> var. <i>transvaalensis</i>	<i>Gladiolus sericeovillosus</i> subsp. <i>calvatus</i>
<i>Cyrtanthus tuckii</i> var. <i>tuckii</i>	<i>Gladiolus sericeovillosus</i> subsp. <i>sericeovillosus</i>



Haemanthus montanus

Kniphofia albescens

Kniphofia typhoides

Leucospermum cuneiforme

Satyrium neglectum subsp. *neglectum* var. *neglectum*

Zantedeschia albomaculata subsp. *macrocarpa*

The following macro habitat types were delineated from aerial imagery of the study area:

Natural Terrestrial Grassland Habitat - Short, low cover of herbaceous species, physiognomically dominated by grasses, but with a high diversity of forbs. The conservation status of these grasslands, on a regional scale, is Endangered and Vulnerable; remaining natural grassland habitats within the study area are therefore regarded sensitive. The presence of plant taxa of conservation importance within the preferred site is documented;

Linear Infrastructure - A number of roads, power line servitudes, railways and conveyor facilities are present. The presence of linear infrastructure should therefore not be considered a restriction to the proposed activity;

Transformed & Degraded Grassland Habitat - Commercial cultivation represents the major land transformation activity in the region resulting. The likelihood of encountering Red Data plant species within these areas is regarded low because of habitat transformation and degradation. A low floristic status is frequently ascribed to these parts. The use of these parts of the study are for the proposed activity is strongly recommended as it unlikely that floristic attributes of conservation importance will be affected within these parts; and

Wetland Vegetation - Vegetation associated with aquatic habitat types are regarded highly sensitive and all impacts should ideally be avoided within, and near to, these features. A wide variety of these habitat types feature in the study area, including perennial and non-perennial streams, rivers, small drainage lines, wetland marshes, hillslope seepages, artificial impoundments and unchannelled valley bottoms. These areas are also frequently colonised by plant taxa of conservation importance. Impacts within these systems are not only reflected on the actual site, but are also 'exported' downstream, resulting in cumulative impacts with large footprints.

1.3 Faunal Assessment

It is important to view the study area on an ecologically relevant scale; consequently; all sensitive animal species (specific faunal groups) known from Mpumalanga were therefore included in this assessment (except for the avifauna which focuses on the Q-grids of the study area). In order to assess the probability of occurrence (PoC) of Red Data species not recorded in the study area during the field assessment, the following criteria were employed:

- the size of the study area;
- the location and connectivity of the study area with regards to other natural faunal habitats; and,
- the presence/absence, status and diversity of natural faunal habitats within the study area.

These criteria were used in conjunction with the known distribution of Red Data species as well as their known habitat requirements to estimate their likelihood of occurring in the study area. A total of 115 Red Data species from five categories (IUCN) are known to occur in the Mpumalanga Province (Invertebrates,



Reptiles, Frogs and Mammals) and the Q-grids 2729BA and 2729BB (birds¹), included in the following conservation categories:

- 23 species are listed as Data Deficient (DD);
- 42 species are listed as Near Threatened (NT);
- 34 species are listed as Vulnerable (VU);
- 11 species are listed as Endangered (EN); and
- 5 species are listed as Critically Endangered (CR).

Estimations for the PoC for Red Data fauna taxa for the study area yielded the following results:

- 41 species have a low PoC;
- 14 species have a moderate-low PoC;
- 31 species have a moderate PoC;
- 7 species have a moderate-high PoC; and
- 15 species have a high PoC.

Seven Red Data species have been recorded, or are known to occur, in the study area. Mpumalanga includes 31 provincially listed protected species (www.speciesstatus.sanbi.org – NEMBA status); three species are considered at least moderately likely (moderate) and four species highly likely to occur in the study area (high).

The known presence of several conservation important animal taxa in the preferred area renders this portion of land less suitable for the proposed project. Development of this portion of land is likely to result in severe impacts on the faunal component. Results of the ecological assessment established the availability of other portions of land that is less sensitive in terms of faunal attributes and the use of these portions are strongly recommended. The *ex situ* conservation of conservation important species should only be considered as an absolute last resort when no other option is available for the proposed development. The EIA phase of the project will afford the opportunity to establish the presence/ absence of conservation important species on the selected portion of land.

1.4 Ecological Sensitivity & Recommendations

For this particular screening assessment, the degree of transformation was used as a primary decision tool in determining the level of sensitivity of a particular site. A secondary decision was made based on the level of conservation importance ascribed to the regional vegetation type. Lastly, historic sampling records of conservation important flora and fauna taxa within the region were also implemented to ascribe a high level of importance/ sensitivity to a particular site. The ecological sensitivity of areas characterised by natural habitat was assessed using the application of the following criteria:

- The presence of Threatened and/or Protected:
 - plant species (**YES**);
 - animal species (**YES**);
 - ecosystems (**YES**);
- The presence of Critical conservation areas, including:

¹ Please note that general comments pertaining to avifauna are included in this report as it does relate to biodiversity in general. A separate avifaunal report, specifically dealing with birds, was commissioned by Eskom; the aims and objectives of these two studies do differ.



- areas of high biodiversity (**YES**);
- centres of endemism (**NO**);
- The presence of Important Ecological Processes, including:
 - Corridors (**NO**);
 - Mega-conservancy networks (**NO**);
 - Rivers and wetlands (**YES**); and
 - Important topographical features (**NO**).

It is evident from the sensitivity analysis that the western part of the study area, and in particular, the preferred site, is regarded unsuitable for the proposed development due to biodiversity sensitivities. Aspects that contributed to the high sensitivity of this area include the Endangered regional conservation status of the Soweto Highveld Grassland as well as the known/ confirmed presence of several conservation important flora and fauna taxa. The existence of a relocation programme within the region whereby these species (with particular reference to the Sungazer Lizard) are being relocated did not influence the sensitivity.

It is important to note that the presence of conservation important species is a confluence of numerous biological and biophysical characteristics, resulting in habitat that to which they are adapted. Of even greater importance is the fact that loss of habitat resulting from agriculture and industrial developments, results in sustained pressure on the habitat of these plants and animals. Losses to these habitat types are usually irreversible. Even though a relocation programme (*ex situ* conservation) might be successful, the *in situ* conservation of plants and animals should be a priority. The fact that a number of conservation important specie co-exist within this particular site (the preferred site), strongly reflects the importance of this area in terms of biodiversity attributes. Recent studies (BEC 2006, 2008, 2010) have indicated that, although the region is diverse and that various conservation important plant and animal taxa occur throughout the region, this particular site is regarded exceptional in terms of biodiversity importance and diversity.

It is therefore strongly recommended that a suitable area be selected from the eastern side of the study area.



2 TERMS OF REFERENCE

Objectives of this Biodiversity Scoping Assessment are to assess available information in order to provide an overview of the ecology of the proposed site and surrounds. More specifically, the presence/ absence, variability and inherent ecological sensitivity of the proposed project area will be ascertained. Likely and expected impacts on the biological environment will be identified and pertinent recommendations for the EIA phase of the project will be provided. Results of this assessment will ultimately be incorporated into the EIA Assessment that will provide detailed, site-specific information and evaluate all expected and likely impacts on the biological environment.

The Terms of Reference for the floristic assessment are as follows:

- Obtain all relevant Précis and Red Data flora information;
- Conduct a photo analysis of the proposed area;
- Identify preliminary floristic variations;
- Conduct a brief site investigation in order to obtain a understanding of the floristic environment;
- Assess the potential presence of Red List flora species according to information obtained from SANBI;
- Incorporate existing biophysical information of the region into the assessment;
- Describe broad habitat variations present in the study area in terms of biophysical attributes and phytosociological characteristics;
- Compile a floristic sensitivity analysis;
- Incorporate results into the Biodiversity Scoping Evaluation;
- Recommend a suitable site that will not result in significant impacts on the floristic environment;
- Map all relevant aspects;
- Provide pertinent recommendations; and
- Present all results in a suitable format.

The Terms of Reference for the faunal assessment are as follows:

- Obtain available faunal distribution records and Red Data faunal information
- Conduct a brief site investigation in order to obtain an overview of the faunal environment;
- Assess the potential presence of Red Data fauna species;
- Incorporate existing knowledge of the region;
- Describe the status of available habitat in terms of faunal attributes, preferences and conservation potential;
- Compile a faunal sensitivity analysis;
- Incorporate results into the Biodiversity Scoping Evaluation;
- Recommend a suitable site that will not result in significant impacts on the faunal environment;
- Map all relevant aspects; and
- Present all results in a suitable format.