

Interested and Affected Party Register

LAST NAME	FIRST NAME	ORGANISATION	FARM NAME	FARM PORTION	DATE OF NOTIFICATION	NOTIFICATION TYPE	DATE OF REMINDER NOTIFICATION
Landowners (Within the Mining Rights Area Boundary)							
Jordaan	Koos	BAADTJIESBULT BOERDERY PTY LTD	KRANSpan 49	RE	07-Dec-18	E-mail	07-Jan-19
Prinsloo	Attie	AJB Boerdery	KRANSpan 49	1	07-Dec-18	E-mail	07-Jan-19
Prinsloo	Rudi	ROODEBLOEM TRUST	KRANSpan 49	2	07-Dec-18	E-mail	07-Jan-19
Papenfus	Jaco	CMJ PAPENFUS TRUST	KRANSpan 49	3	07-Dec-18	E-mail	07-Jan-19
Klein	Gysbert Samuel	PRIVATE LANDOWNER	KRANSpan 49	4	07-Dec-18	SMS / Post	07-Jan-19
Prinsloo	Rudi	ROODEBLOEM TRUST	KRANSpan 49	5	07-Dec-18	E-mail	07-Jan-19
Papenfus	Kobus	CMJ PAPENFUS TRUST	KRANSpan 49	6	07-Dec-18	E-mail	07-Jan-19
Papenfus	Kobus	CMJ PAPENFUS TRUST	KRANSpan 49	7	07-Dec-18	E-mail	07-Jan-19
Jordaan	Koos	BAADTJIESBULT BOERDERY PTY LTD	KRANSpan 49	8	07-Dec-18	E-mail	07-Jan-19
Occupiers of the Site (Within the Mining Rights Area Boundary)							
Marais	Frans	Private - Lessee	KRANSpan 49	4	07-Dec-18	E-mail	07-Jan-19
Prinsloo	Rudi	ROODEBLOEM TRUST	KRANSpan 49	8	07-Dec-18	E-mail	07-Jan-19
Jordaan	Koos	BAADTJIESBULT BOERDERY PTY LTD	KRANSpan 49	1	07-Dec-18	E-mail	07-Jan-19
							07-Jan-19
Adjacent Landowners (Landowners Surrounding the MRA Boundary)							
Swart	Dirk	NORTHERN COAL PTY LTD	ROETZ 210	RE	07-Dec-18	E-mail	07-Jan-19
Swart	Dirk	NORTHERN COAL PTY LTD	JAGTLUST 47	1	07-Dec-18	E-mail	07-Jan-19
Swart	Dirk	NORTHERN COAL PTY LTD	JAGTLUST 47	RE	07-Dec-18	E-mail	07-Jan-19
Gangazhe	Mashudu	MSOBO COAL PTY LTD	VERKEERDEPAN 50	1	07-Dec-18	E-mail	07-Jan-19
Gangazhe	Mashudu	MSOBO COAL PTY LTD	VERKEERDEPAN 50	RE	07-Dec-18	E-mail	07-Jan-19
Gangazhe	Mashudu	MSOBO COAL PTY LTD	VERKEERDEPAN 50	2	07-Dec-18	E-mail	07-Jan-19
Gangazhe	Mashudu	MSOBO COAL PTY LTD	VERKEERDEPAN 50	6	07-Dec-18	E-mail	07-Jan-19
Gangazhe	Mashudu	MSOBO COAL PTY LTD	VERKEERDEPAN 50	7	07-Dec-18	E-mail	07-Jan-19
Nkosi	Job	PRIVATE LANDOWNER	WITRAND 52	4	07-Dec-18	SMS / Post	07-Jan-19
Nkosi	Rosina Mango	PRIVATE LANDOWNER	WITRAND 52	4	07-Dec-18	SMS / Post	07-Jan-19
Booi	Sibongile	INGWE SURFACE HOLDINGS LTD (SOUTH32)	ROODEBLOEM 51	1	07-Dec-18	E-mail	07-Jan-19
Jordaan	Koos	NAVIDU INV 10 CC	VAALBANK 212	1	07-Dec-18	E-mail	07-Jan-19
Lukele	Christina	SIYATHUTHUKA CPA	VAALBANK 212	RE	07-Dec-18	SMS	07-Jan-19
Prinsloo	Rudi	ROODEBLOEM TRUST	VAALBANK 212	8	07-Dec-18	E-mail	07-Jan-19
Papenfus Trust	Jacobus	CMJ PAPENFUS TRUST	WITBANK 209	RE	07-Dec-18	E-mail	07-Jan-19
Klein	Gysbert Samuel	NOVA TRUST	NAUDES BANK 172	14	07-Dec-18	SMS / Post	07-Jan-19
Klein	Gysbert Samuel	NOVA TRUST	NAUDES BANK 172	6	07-Dec-18	SMS / Post	07-Jan-19
Municipal Councillors							
Nkosi	Velepi	Ward Councillor: Ward 21			07-Dec-18	E-mail	07-Jan-19
Local and District Municipality							
Nkosi	Paulos	Albert Luthuli Local Municipality			07-Dec-18	E-mail	07-Jan-19
Mavumbela	Lovedale	Albert Luthuli Local Municipality			07-Dec-18	E-mail	07-Jan-19
-	Molly	Albert Luthuli Local Municipality: Electricity			07-Dec-18	E-mail	07-Jan-19
Nkosi	D	Albert Luthuli Local Municipality: Mayor			07-Dec-18	E-mail	07-Jan-19
-	Mbuso	Albert Luthuli Local Municipality: Roads			07-Dec-18	E-mail	07-Jan-19
DM	Modimogale	Albert Luthuli Local Municipality: Service Delivery			07-Dec-18	E-mail	07-Jan-19
Gumede	ME	Albert Luthuli Local Municipality: Water			07-Dec-18	E-mail	07-Jan-19
Chirwa	MG	Gert Sibande District Municipality: Mayor			07-Dec-18	E-mail	07-Jan-19
B	Phiwe	Gert Sibande District Municipality: Roads			07-Dec-18	E-mail	07-Jan-19
T	Ephraim	Gert Sibande District Municipality: Service Delivery			07-Dec-18	E-mail	07-Jan-19
P	Tshidi	Gert Sibande District Municipality: Water			07-Dec-18	E-mail	07-Jan-19

Organs of State with Jurisdiction							
Venter	Jan	Department of Agriculture: Land Use and Soil Management			07-Dec-18	E-mail	07-Jan-19
Sekgetho	Seapei	Department of Mineral Resources DDMLA			07-Dec-18	E-mail	07-Jan-19
Tshivhandekano	Aubrey	Department of Mineral Resources: Regional Manager			07-Dec-18	E-mail	07-Jan-19
Netshikweta	Herbert	Department of Mineral Resources Senior Inspector			07-Dec-18	E-mail	07-Jan-19
Mokonyane	Martha	Department of Mineral Resources: Emalahleni			07-Dec-18	E-mail	07-Jan-19
Mutengwe	Mashudu	Department of Mineral Resources: Emalahleni			07-Dec-18	E-mail	07-Jan-19
Ratsela	Matshilele	Department of Mineral Resources: Emalahleni			07-Dec-18	E-mail	07-Jan-19
Mathavhela	Sam	Department of Mineral Resources: Pretoria - Environment Authorisations: Mpumalanga			07-Dec-18	E-mail	07-Jan-19
Mfeka	Nonqubeko	Department of Rural Development and Land Reform			07-Dec-18	E-mail	07-Jan-19
Masuku	Lazarus	Department of Rural Development and Land Reform			07-Dec-18	E-mail	07-Jan-19
Mlomo	Bongani	Department of Rural Development and Land Reform			07-Dec-18	E-mail	07-Jan-19
Ratlhagane Simon	Mabuse	Department of Rural Development and Land Reform			07-Dec-18	E-mail	07-Jan-19
Ledwaba Christa	Mokgaetji	Department of Rural Development and Land Reform			07-Dec-18	E-mail	07-Jan-19
Mathabe	Thato	Department of Rural Development and Land Reform			07-Dec-18	E-mail	07-Jan-19
Makeke	Theledi	Department of Rural Development and Land Reform (Mpumalanga)			07-Dec-18	E-mail	07-Jan-19
Mushwana	Rose	Department of Rural Development and Land Reform (Mpumalanga)			07-Dec-18	E-mail	07-Jan-19
Khoza	Vusi	Department of Rural Development and Land Reform (Mpumalanga)			07-Dec-18	E-mail	07-Jan-19
Mulaudzi	Masala	Department of Water and Sanitation			07-Dec-18	E-mail	07-Jan-19
van Aswegen	Johan	Department of Water and Sanitation			07-Dec-18	E-mail	07-Jan-19
Maliaga	Simon	Department of Water and Sanitation (Bronkhorstspuit)			07-Dec-18	E-mail	07-Jan-19
Mare	Charmaine	Eskom Holdings SOC LTD			07-Dec-18	E-mail	07-Jan-19
Muswubi	Mpho	Eskom Transmission Land and Rights Mpumalanga			07-Dec-18	E-mail	07-Jan-19
Rasiuba	Thabo	Inkomati Usuthu Catchment Management Agency (IUCMA)			07-Dec-18	E-mail	07-Jan-19
Dzhangji	Thandi	Inkomati Usuthu Catchment Management Agency (IUCMA)			07-Dec-18	E-mail	07-Jan-19
Marebane	S	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs			07-Dec-18	E-mail	07-Jan-19
Nyathikazi	Bheki	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs			07-Dec-18	E-mail	07-Jan-19
de Lange	A	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs			07-Dec-18	E-mail	07-Jan-19
Nkambule	Ntokozo	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs			07-Dec-18	E-mail	07-Jan-19
Xulu	SP	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs: HoD			07-Dec-18	E-mail	07-Jan-19
Mthombothi	W	Mpumalanga Department of Community Safety, Security and Liason: HoD			07-Dec-18	E-mail	07-Jan-19
Chunda	C	Mpumalanga Department of Co-Operative Governance and Traditional Affairs: HoD			07-Dec-18	E-mail	07-Jan-19
Mnisi	SW	Mpumalanga Department of Culture, Sports and Recreation: HoD			07-Dec-18	E-mail	07-Jan-19
Nxumalo	Tinyiko	Mpumalanga Department of Economic Development and Tourism					
Nkosi	Prudence	Mpumalanga Department of Economic Development and Tourism					
Mkhize	MW	Mpumalanga Department of Economic Development and Tourism			07-Dec-18	E-mail	07-Jan-19
Sebitso	N	Mpumalanga Department of Economic Development and Tourism			07-Dec-18	E-mail	07-Jan-19
Thobela	M	Mpumalanga Department of Economic Development and Tourism			07-Dec-18	E-mail	07-Jan-19
Mdluli	JD	Mpumalanga Department of Economic Development and Tourism			07-Dec-18	E-mail	07-Jan-19
Mnisi	JM	Mpumalanga Department of Economic Development and Tourism			07-Dec-18	E-mail	07-Jan-19
Makwetla	TI	Mpumalanga Department of Economic Development and Tourism			07-Dec-18	E-mail	07-Jan-19
Mdluli	LM	Mpumalanga Department of Economic Development and Tourism			07-Dec-18	E-mail	07-Jan-19
Mhlabane	M	Mpumalanga Department of Education: HoD			07-Dec-18	E-mail	07-Jan-19
	Josephine	Mpumalanga Department of Health: HoD			07-Dec-18	E-mail	07-Jan-19
Matshebula	SEB	Mpumalanga Department of Human Settlements: HoD			07-Dec-18	E-mail	07-Jan-19
Mohlaseedi	K	Mpumalanga Department of Public Works, Roads and Transport: HoD			07-Dec-18	E-mail	07-Jan-19
Mahlalela	X	Mpumalanga Department of Social Development: HoD			07-Dec-18	E-mail	07-Jan-19
Sithole	XGS	Mpumalanga Economic Growth Agency			07-Dec-18	E-mail	07-Jan-19
Johnson	U	Mpumalanga Economic Growth Agency			07-Dec-18	E-mail	07-Jan-19
Moduka	Benjamin	Mpumalanga Heritage Resources Authority			07-Dec-18	E-mail	07-Jan-19
Mokoena	Lineth	Mpumalanga Heritage Resources Authority			07-Dec-18	E-mail	07-Jan-19
Mtshweni	R	Mpumalanga Premier			07-Dec-18	E-mail	07-Jan-19
Sibiya	A	Mpumalanga Tourism and Parks Agency			07-Dec-18	E-mail	07-Jan-19
de Jesus	C	Mpumalanga Tourism and Parks Agency			07-Dec-18	E-mail	07-Jan-19

de Kock	Rene	SANRAL SOC LTD.			07-Dec-18	E-mail	07-Jan-19
Khumalo	N	South African Heritage Resource Agency			07-Dec-18	E-mail	07-Jan-19
Ndou	Livhuwani	Transnet SOC LTD.			07-Dec-18	E-mail	07-Jan-19
Monyamane	Ezekiel	Transnet SOC LTD.			07-Dec-18	E-mail	07-Jan-19
Reddy	Krishna	Transnet SOC LTD.			07-Dec-18	E-mail	07-Jan-19
Papenfus	Norman	Transnet SOC LTD.			07-Dec-18	E-mail	07-Jan-19
Tshivhandekano	Aubrey	Department of Mineral Resources			07-Dec-18	E-mail	07-Jan-19
Nkosi	Sam	Department of Rural Development and Land Reform			07-Dec-18	E-mail	07-Jan-19
Other							
Stols	Nico	Mine Manager Msobo			07-Dec-18	E-mail	07-Jan-19
Mukwevho	Livhuwani	Environmental Manager: Ilima			07-Dec-18	E-mail	07-Jan-19
Davel	Robert	Mpumalanga Agriculture			07-Dec-18	E-mail	07-Jan-19
Rathbone	David	Chrissiesmeer Lake District			07-Dec-18	E-mail	07-Jan-19

APPENDIX 7: TERRESTRIAL ECOLOGY SCREENING REPORT

Terrestrial Ecology Screening:

Ilima Coal Mine

Carolina, Mpumalanga Province

November 2018

Prepared for: ABS Africa
Building 2, Country Club Estate
Woodlands Drive, Woodmead 2080
Gauteng, South Africa

Prepared by: ECOREX Consulting Ecologists CC
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Declaration of Independence

We declare that we have been appointed as independent consulting ecologists with no affiliation with or vested financial interests in the proponent, other than remuneration for work performed. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. Remuneration for our services by the proponent is not linked to approval by any decision-making authority responsible for authorising this development.

*W.L. McClelland**15 November 2018*

1. INTRODUCTION

1.1. BACKGROUND

Ilima Coal Company (Pty) Ltd. (Ilima) has been granted a Prospecting Right (MP30/5/1/2/2/102PR) for the the Kranspan Prospecting Right area. Ilima intends to develop a coal mine on the site and have appointed ABS Africa to undertake the Environmental and Social Impact Assessment (ESIA) as part of pre-feasibility and detailed feasibility assessments. This specialist report forms part of the ESIA, and concerns the terrestrial ecosystems that may be impacted by the proposed mine. This report is based on a desktop review of available data only, and will be updated by a field survey to be undertaken by ECOREX in January / February 2018.

1.2 PROJECT DESCRIPTION

A full project description is given in the main body of the ESIA.

1.3 AIMS OF THIS REPORT

The aims of this report were:

- *Review:* To collate and review relevant and available ecological information for the study area, and to identify data gaps, as well as propose a fieldwork strategy to fill these gaps;
- *Baseline Conditions:* To summarise the baseline ecological conditions in the Study Area, based on a desktop review, including ecosystem classification, assessment of conservation importance and biodiversity value, and existing threats to biodiversity;
- *Key Issues:* To identify and assess key issues related to potential impacts of the proposed development on terrestrial ecosystems.

1.4 STUDY TEAM

Warren McClelland – Terrestrial Ecologist. Warren is the owner and director of ECOREX Consulting Ecologists CC, a consultancy of flora and vertebrate fauna specialists based in Mpumalanga, South Africa. He has been involved in specialist biodiversity assessments for a wide range of developments, particularly mining, throughout sub-Saharan Africa over the past 15 years. Countries of work experience outside of South Africa include Democratic Republic of the Congo, Republic of Guinea, Sierra Leone, Liberia, Mali, Tanzania, Kenya, Zambia, Malawi, Mozambique, Namibia and Swaziland. Warren is the co-author of the “Field Guide to the Trees & Shrubs of Mpumalanga & Kruger National Park” published in 2002, and is currently working on a field guide to the Wildflowers of the Kruger National Park.

Duncan McKenzie – Terrestrial Ecologist. Duncan has been involved in biodiversity assessments for ECOREX for ten years and countries of work experience include Lesotho, Swaziland, Mali, Mozambique, Guinea, Sierra Leone, South Africa, Tanzania and Democratic Republic of the Congo. Duncan has previously worked as a Regional Coordinator for the Mondi Wetlands Project and lectures on many aspects of conservation in Mbombela and the Kruger National Park. He is currently the Regional Co-ordinator for the South African Bird Atlas Project, sits on the KZN Bird Rarities Committee and is a co-author on the Wildflowers of the Kruger National Park project.

Linda McKenzie – GIS. Linda is a GIS Specialist/GIS Analyst with over 13 years' experience in the industry. For the last six years she has operated her own GIS Consultancy called Digital Earth. She has extensive experience in both the private and public sector, and has worked on a wide variety of projects and GIS applications. Most recently, these include vegetation and sensitivity mapping, landcover data capture, municipal roads master planning, hydroelectric scheme and wind farm feasibility mapping and town planning, land surveyor and engineering support services. Linda currently serves as Vice Chairperson and Treasurer for GISSA Mpumalanga and is a registered Professional GISc Practitioner (PGP0170).

2. DETAILED TERMS OF REFERENCE

- Review relevant available information to understand the regional biodiversity setting and develop a list of species of conservation significance potentially present on the site.
- Analyse aerial or satellite imagery and prepare a preliminary map of vegetation communities within the study area.
- Prepare survey protocol for a rapid assessment of the study area during the wet season to ground truth the preliminary map and investigate the following:
 - types and condition of terrestrial habitats present within the study area (including an understanding of their vulnerability in relation to current threats and their uniqueness);
 - indications of the species richness within the terrestrial habitats (including key floral and faunal groups, dominant species, endemic species, threatened species, and alien invasive species);
 - indications of vegetation community structure and composition (using timed-meander transects where appropriate) at representative locations;
 - presence of sensitive habitats and landscapes.
- Assess the potential biodiversity value of the different habitats represented.
- Identify potential key impacts of the project on biodiversity.

3. STUDY AREA

The Ilima Coal Project is located approximately 13 km south-west of the town of Carolina in Albert Luthuli Local Municipality, Mpumalanga Province (Figure 1). The study area covers 3383 hectares and comprises nine portions of the farm Kranspan 49-IT. Ilima Coal has been granted a Prospecting Right for this area (No. 44/2016 (PR) [MP30/5/1/2/2/102PR]), which expires in March 2019.

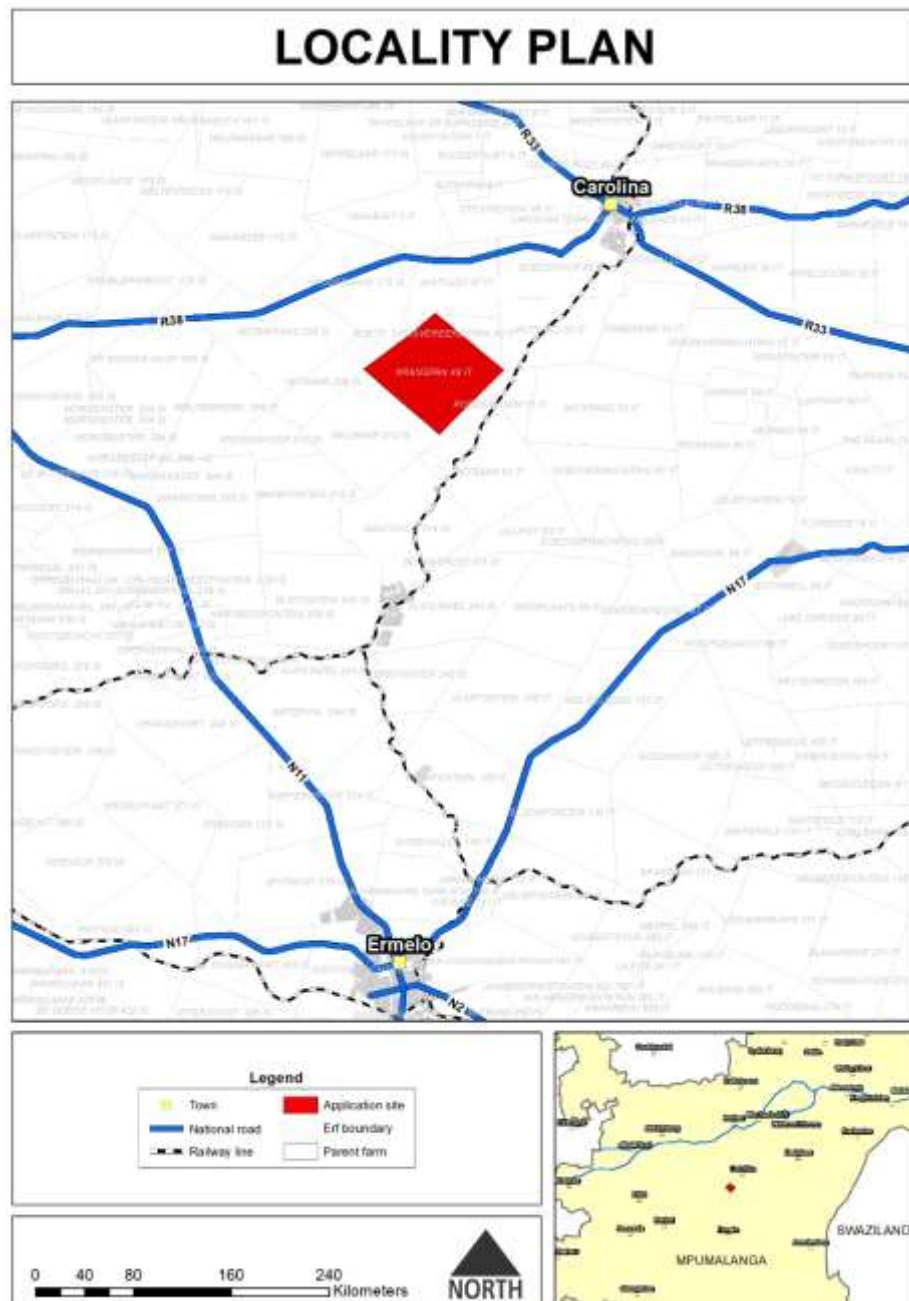


Figure 1. Location of the Ilima Coal Study Area

4. METHODS

4.1 FLORA

The Botanical Database of Southern Africa (BODATSA), which is curated by the South African National Biodiversity Institute (SANBI), was queried for a list of plant species that have been recorded from a 20 km radius of the study area. BODATSA contains records from the National Herbarium in Pretoria (PRE), the Compton Herbarium in Cape Town (NBG & SAM) and the KwaZulu-Natal Herbarium in Durban (NH).

Version 2017.1 of the Red List of South African plants (<http://redlist.sanbi.org/index.php>), which is managed as part of SANBI's Threatened Species Programme, was consulted for the current conservation status of each species in the above list. The term "Species of Conservation Concern" (SCC) as defined by Raimondo *et al.* (2009) was followed in this report, namely all species classified as threatened (Critically Endangered, Endangered and Vulnerable), as well as species classified as Data Deficient, Near Threatened, Critically Rare, Rare and Declining.

Mucina & Rutherford (2006) was the primary reference for determining the regional context of the vegetation occurring in the vicinity of the study area.

A broad-scale landcover map was compiled by Digital Earth using satellite imagery. This will provide for the first level of habitat differentiation into Modified and Natural Habitat following the definitions in the International Finance Corporation's Performance Standard 6 (Biodiversity Conservation and Sustainable Management of Living) (IFC, 2012). These categories will be refined once wet season fieldwork has been completed.

4.2 TERRESTRIAL FAUNA

Mammals

Friedmann & Daly (2004) and the Virtual Museum of African Mammals (MammalMAP, 2017) were used to prepare a list of mammal species that have been confirmed to occur within 2922CD as well as adjacent QDSs. Conservation status assessments for each species were obtained from Friedmann & Daly (2004) and online updates on the Endangered Wildlife Trust's Mammal Red List (<https://www.ewt.org.za/Reddata/reddata.html>).

Birds

The online database of the Southern African Bird Atlas Project (SABAP2) was queried for a list of bird species confirmed to occur in the relevant QDSs that the study area is located in, namely 2629BB and 2630AA¹². At a finer mapping scale, lists of bird species recorded during SABAP2 in the the four pentads (mapping units) in which the study area is located (2610_3000, 2605_3000, 2610_2955 and 2605_2955) were downloaded and are included in Appendix 3. Taylor *et al.* (2016) was consulted for the most current conservation status of each species of conservation concern on the above lists.

Herpetofauna

The primary reference for compiling a list of potentially occurring reptiles was Bates *et al.* (2016), and Du Preez & Carruthers (2009) and Minter *et al.* (2004) for a list of potentially occurring amphibians. The Reptile Atlas of Southern Africa (ReptileMAP, 2017)³ and Frog Atlas of Southern Africa (FrogMAP, 2017)⁴, which are continuously updated online databases that reflect the most current distribution data for reptiles and amphibians in South Africa, were used to supplement the data from the above references and to indicate the most current taxonomy.

4.3 ECOLOGICAL SENSITIVITY

For the purposes of this study, Ecological Sensitivity (ES) is considered to be a function of Conservation Value (CV) of the receptor (e.g. habitat unit) and its sensitivity to impacts or Receptor Sensitivity Index (RSI). CV is assessed according to presence of populations of SCC as well as suitability of habitat for supporting populations of SCC. RSI is calculated as a function of Vulnerability to impacts and Resilience, i.e. capacity to be restored to original state with limited human intervention.

Ecological Sensitivity is calculated as follows:

$ES = CV + RSI$, where

$RSI = V + R$

¹ http://sabap2.adu.org.za/gap_analysis.php?DGC=SE2629#content_90perc

² http://sabap2.adu.org.za/gap_analysis.php?DGC=SE2630#content_90perc

³ <http://vmus.adu.org.za/>, formerly SARCA

⁴ <http://vmus.adu.org.za/>, formerly SAFAP

Table 1 indicates how ES is interpreted in relation to these variables.

Table 1. Ecological Sensitivity Matrix

Receptor Sensitivity Index		Resilience				
		Very Low	Low	Medium	High	Very High
Vulnerability	Very High	Very High	High	Med-High	Medium	Medium
	High	High	Med-High	Medium	Medium	Low
	Medium	Med-High	Medium	Medium	Low	Low
	Low	Medium	Low	Low	Low	Low
	Very Low	Low	Low	Low	Low	Low

Ecological Sensitivity		Conservation Value				
		Very High	High	Med-High	Medium	Low
Receptor Sensitivity Index	Very High	Very High	Very High	High	Med-High	Medium
	High	Very High	High	Med-High	Medium	Medium
	Med-High	High	Med-High	Medium	Medium	Low
	Medium	Med-High	Medium	Medium	Low	Low
	Low	Medium	Medium	Low	Low	Low

4.4 ASSUMPTIONS AND LIMITATIONS

- The description of the baseline terrestrial ecology and potential impacts on terrestrial ecosystems in this report is based on a desktop study only and should be considered incomplete until data specific to the study area have been collected during summer fieldwork.
- While the potential impacts on terrestrial ecosystems are briefly described in this report, the significance of impacts was not assessed at this stage since no primary data have yet been collected. Impacts will be assessed in the updated report following wet season fieldwork.

5. BIODIVERSITY BASELINE DESCRIPTION

5.1 FLORA

5.1.1 Regional Context

5.1.1.1 National Vegetation Types

The study area is situated within the Grassland Biome, which dominates the high central and eastern plateau of South Africa (Highveld), as well as the mountainous region of Mpumalanga, western KZN and the Eastern Cape (Drakensberg). This area is characterised by summer rainfall and winter drought, and regular frost in winter (Mucina & Rutherford, 2006). Local plant species richness is high in the Grassland Biome and five centres of plant endemism have been described within the biome. Four geographically distinct bioregions are present within this biome, namely Drakensberg Grassland, Dry Highveld Grassland, Mesic Highveld Grassland and Sub-escarpment Grassland. The study area is situated within the Mesic Highveld Grassland Bioregion within the Eastern Highveld Grassland national vegetation type (Gm12), which is described in more detail below (following Mucina & Rutherford, 2006):

Eastern Highveld Grassland

This vegetation type is endemic to Gauteng and Mpumalanga provinces, occurring from the East Rand in the west to Belfast in the east, and extending as far south as Bethal, Ermelo and Piet Retief. Terrain comprises slightly to moderately undulating plains with scattered rocky outcrops and pan depressions. Soils are mostly red to yellow sandy soils on shale and sandstone of the Madzaringwe Formation (Karoo Supergroup). Mean annual precipitation varies from 650 to 900 mm, of which almost all occurs in summer, and frost incidence varies from 13-42 days per year. Floristic composition and important taxa are indicated in

Table 2 below. Eastern Highveld Grassland has a conservation status of Endangered because of a very high level of habitat loss (44%) and very low level of protection.

Table 2. Floristic composition and important taxa in Eastern Highveld Grassland

Important Taxa	
Dominant Grasses	<i>Aristida aequiglumis</i> , <i>A. congesta</i> , <i>A. junciformis</i> , <i>Brachiaria serrata</i> , <i>Cynodon dactylon</i> , <i>Digitaria monodactyla</i> , <i>D. tricholaenoides</i> , <i>Elionurus muticus</i> , <i>Eragrostis chloromelas</i> , <i>E. curvula</i> , <i>E. plana</i> , <i>E. racemosa</i> , <i>E. sclerantha</i> , <i>Heteropogon contortus</i> , <i>Loudetia simplex</i> , <i>Microchloa caffra</i> , <i>Monocymbium cerasiiforme</i> , <i>Setaria sphacelata</i> , <i>Sporobolus africanus</i> , <i>S. pectinatus</i> , <i>Themeda triandra</i> , <i>Trachypogon spicatus</i> , <i>Tristachya leucothrix</i> .
Herbaceous Plants	<i>Berkheya setifera</i> (dominant), <i>Haplocarpha scaposa</i> (dominant), <i>Justicia anagalloides</i> (dominant), <i>Pelargonium luridum</i> (dominant), <i>Acalypha angustata</i> , <i>Dicoma anomala</i> , <i>Helichrysum aureonitens</i> , <i>H. callicomum</i> , <i>H. oreophilum</i> , <i>Pentanisia prunelloides</i> , <i>Senecio coronatus</i> , <i>Hilliardiella oligocephala</i> , <i>Wahlenbergia undulata</i> .
Geophytes	<i>Gladiolus crassifolius</i> , <i>Haemanthus humilis</i> subsp. <i>hirsutus</i> , <i>Hypocis rigidula</i> , <i>Ledebouria ovatifolia</i> .
Succulents	<i>Aloe ecklonis</i> .
Low Shrubs	<i>Anthospermum rigidum</i> , <i>Stoebe plumosa</i> .

An azonal national vegetation type that is embedded throughout Eastern Highveld Grassland and is relevant to the study area is Eastern Temperate Freshwater Wetlands (AZf3). This is a widespread vegetation type occurring in Northern Cape, Eastern Cape, Free State, North-West, Gauteng, Mpumalanga and KwaZulu-Natal, and is associated with shallow stagnant or slow-moving waterbodies such as pans, seasonally flooded vleis and sluggish rivers.

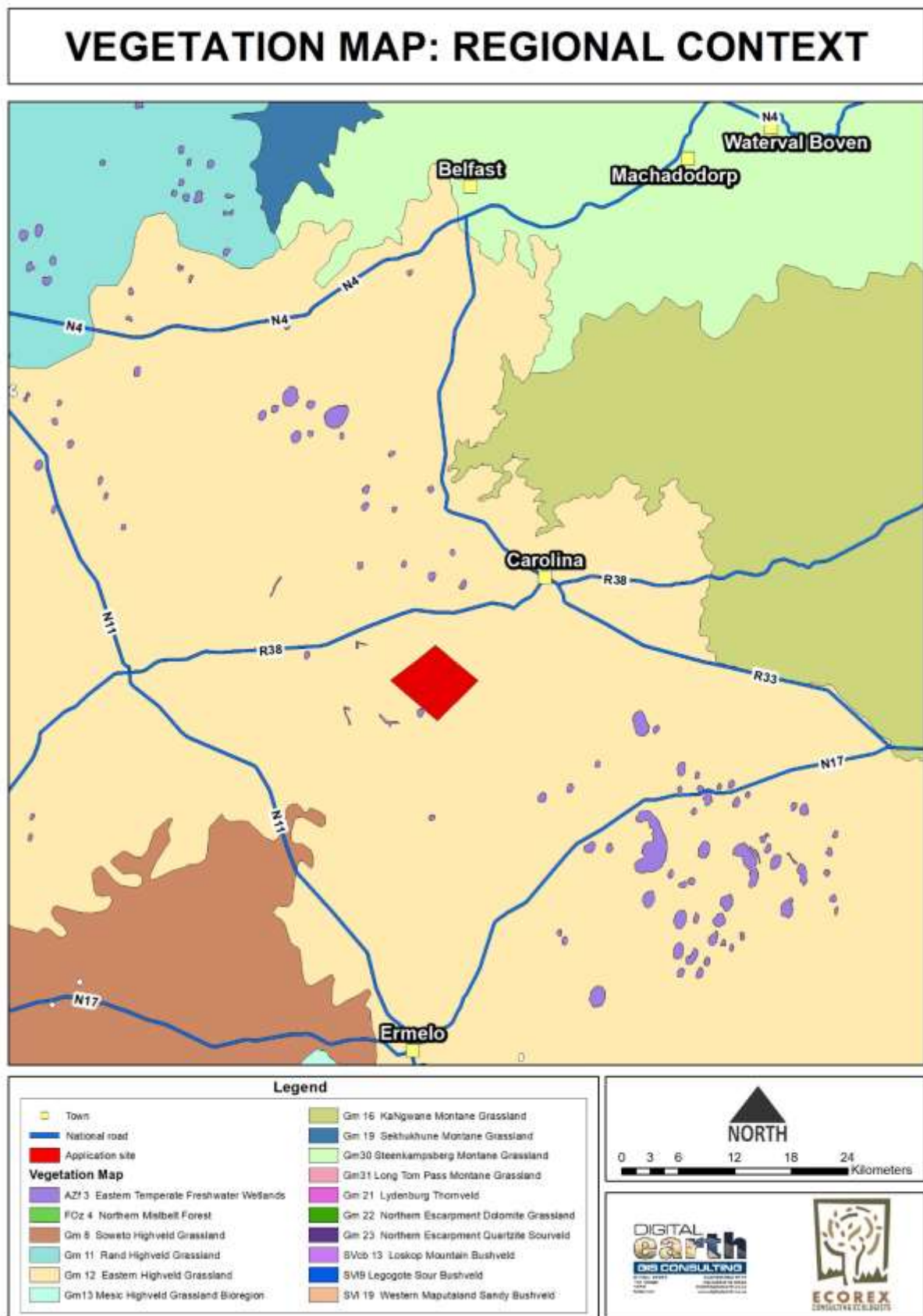


Figure 2. National Vegetation Types represented in the Study Area

5.1.1.2 Centres of Plant Endemism

The study area is not situated within any centres of plant endemism as defined by Van Wyk & Smith (2001).

5.1.1.3 Threatened Ecosystems

Eastern Highveld Grassland is a listed Threatened Ecosystem (Vulnerable) under Notice 1002 of Government Gazette 34809, 9 December 2011.

5.1.2 Local Context – Vegetation Assemblages

The Botanical Database of Southern Africa (BODATSA), which is curated by SANBI, lists 401 plant species from 74 families for a 20 km radius of the study area (Appendix 1). The dominant plant families in the flora are the Asteraceae (54 spp), Poaceae (45 spp), Fabaceae (29 spp), Cyperaceae (23 spp) and Apocynaceae (20 spp). This is likely to be significantly higher plant species diversity than that which is in the study area as the data search parameters included a larger area with a greater variety of habitats. However, it does give an indication of the dominant families and provides a list of species to expect during summer fieldwork. A full list of plant species confirmed to occur in the study area will be provided subsequent to summer fieldwork.

The description of broad-scale vegetation assemblages below is based primarily on analysis of high-resolution satellite imagery and has not been verified yet by fieldwork data. An updated report will be submitted subsequent to completion of summer fieldwork, which will contain information regarding the dominant and diagnostic species per vegetation assemblage.

Two broad-scale vegetation communities have been identified within the study area as representing Natural Habitat as defined by IFC (2012), namely Untransformed Grassland and Wetlands, while waterbodies such as Endorheic Pans are considered part of the Wetland community. An overview of all Natural Habitat is given below. Each of these vegetation communities will be described in detail once fieldwork has taken place. Areas that can be classified as Modified Habitat, such as cultivated lands, buildings and tree plantations, cover 1575 ha (47%) of the study area. These areas are not dealt with in the descriptions below.

5.1.2.1 Untransformed Grassland

Approximately 1450 ha of the study area (43%) still comprises Untransformed Grassland that is most likely representative of Eastern Highveld Grassland, although possibly overgrazed and

lower in species composition than undisturbed grassland (Figure 3). This is the vegetation assemblage in which most plant species of conservation concern are likely to be found and is the habitat that is most likely to support populations of fauna species of conservation concern.

5.1.2.2 Wetlands

At least three wetland types are represented in the study area, namely Endorheic Pans, Valley-bottom Wetlands and Hillslope Seeps, covering approximately 330 ha (Figure 3). Satellite imagery indicates several circular to sub-circular permanent or seasonal pans in the study area, of which Kranspan is the most significant, covering approximately 125 ha. Kranspan and another pan to the north-east are likely to support significant numbers of congregatory waterbirds at certain times of the year. While wetlands typically have lower species diversity than adjacent undisturbed grassland, a high proportion of habitat specialist plants are usually present and likelihood of fauna species of conservation concern being present is moderate to high.

LANDCOVER MAP: LOCAL CONTEXT

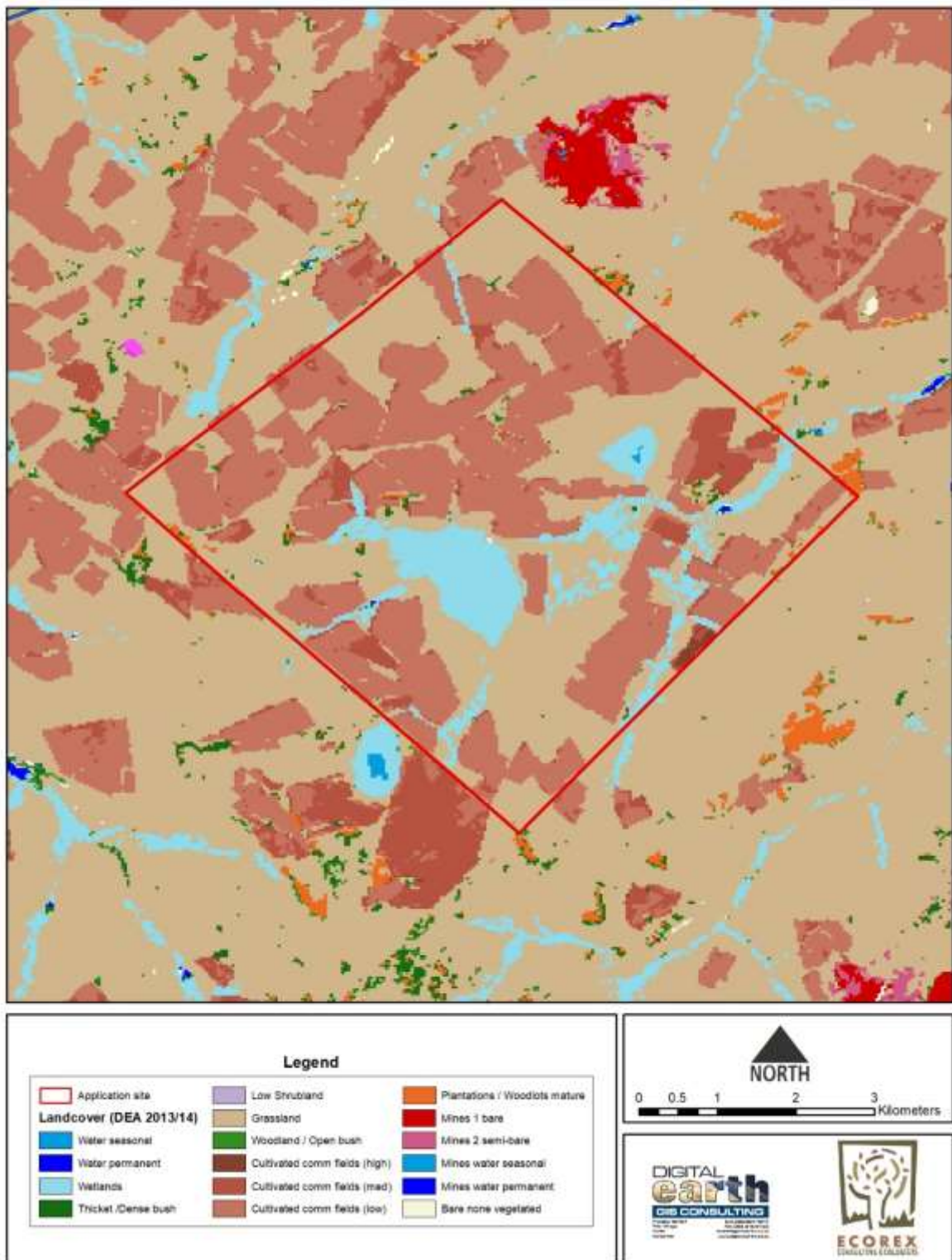


Figure 3. Natural and Modified Habitat represented in the study area

5.1.3 Species of Conservation Concern

Thirteen Species of Conservation Concern (SCC) have been recorded from the two quarter-degree grids that the study area is situated in (2629BB, 2630AA) (Appendix 2). Sixteen of these are classified as threatened (Critically Endangered, Endangered or Vulnerable), although most of these have a low likelihood of occurrence because of a lack of suitable habitat and / or altitude. Three species have a high likelihood of occurring and are dealt with in more detail below.

Alepidea longeciliata

This small herb is endemic to Highveld Grassland in Mpumalanga, occurring in a small area between Breyten, Lothair, Middelburg and Stoffberg, although the records from Middelburg and Stoffberg are putative and its distribution seems to be centred on the Carolina area (De Castro & McClelland, 2015). *Alepidea longeciliata* occurs in grassland overlaying Karoo sandstone and is specifically associated with seasonally wet soils on hillslope seeps in hygrophilous grassland. It is threatened primarily by habitat loss to agriculture and mining, particularly coal mining, and has been assessed as **Endangered** (von Staden et al., 2009). A population is known from a property adjacent to Kranspan 49-IT (De Castro & McClelland, 2015) and it thus has a high likelihood of being present in the study area.

Khadia carolinensis

This small succulent is also endemic to Mpumalanga, occurring in Highveld grassland between Belfast and south of Carolina. It is associated with exposed rocky outcrops, especially sandstone sheetrock, usually on well-drained, sandy loam soils (Lötter et al., 2007). Much of the global population of this species is located over extensive coal reserves for which mining rights have been applied for, and the primary future threat to this species is open-cast coal mining, resulting in a conservation status of **Vulnerable** (Lötter et al., 2007). A population has been confirmed on a property adjacent to Kranspan 49-IT (De Castro & McClelland, 2015) and it thus has a high likelihood of being present in the study area.

Aspidoglossum xanthosphaerum

This species is a slender herb that is nearly endemic to Mpumalanga, occurring in grassland above 1600 masl. Specific habitat requirements are poorly known, but specimens collected from near Breyten were located in short grassland on gentle hillslopes, habitat that is present in the study area (De Castro, 2006). It is thus considered to have a moderate likelihood of occurring, even though there are no records from adjacent properties. Even though *Aspidoglossum xanthosphaerum* is currently only known from four widely separated areas

between Breyten and Wakkerstroom, it is very easily overlooked and is likely to be present on more localities than those currently known. It has been assessed as **Vulnerable** by Nicholas & Victor (2006).

All three of the above species flower from October to November, which would be the optimal time for a survey to confirm the presence or absence of these species in the study area.

5.1.4 Endemic Species

Even though the study area is not situated within any centres of plant endemism as defined by Van Wyk & Smith (2001), eleven range-restricted species that are endemic to Mpumalanga are known to occur in the quarter-degree grids that the study area is situated in (Appendix 2). Most of these species have a low likelihood of occurring on Kranskop 49-IT, apart from *Khadia carolinensis*, *Aspidoglossum xanthosphaerum* and *Alepidea longeciliata*. Each of these species is discussed in section 5.1.3.

5.1.5 Protected Species

Thirty-seven plant species occurring in the general vicinity of the study area are protected under Schedule 11 of the Mpumalanga Nature Conservation Act No. 10 (1998) (Appendix 2). An updated list of protected species confirmed to occur in the study area will be provided once summer fieldwork has been completed.

5.2 TERRESTRIAL FAUNA

5.2.1 Mammals

Regional Context

The study area is situated within the Grassland biome, which is confined to the cool, high-lying plateau of eastern South Africa, Swaziland and Lesotho, as described by Mucina & Rutherford (2006). A number of small mammal species are endemic to this biome, of which only two have been confirmed to occur within the general vicinity of the study area (Friedman & Daly, 2004): Hottentot's Golden Mole (*Amblysomus hottentotus*) and Highveld Golden Mole (*A. septentrionalis*).

Species Richness

A list of 33 mammal species that have been recorded in the QDSs in which the study area is situated is presented in Appendix 3. A list of confirmed mammal species will be provided once summer fieldwork has been completed.

Species of Conservation Concern

Ten species of conservation concern occur on the Highveld in the general vicinity of the study area (Appendix 6), of which eight have been recorded in the quarter-degree grids in which the study area is situated. Five of these have a moderate to high likelihood of occurring in the study area, all of which are classified as NT (Appendix 1). Two additional species for which there are no records in the vicinity of the study area, but which have a moderate likelihood of occurring are one VU species (Spotted-necked Otter *Hydrictis maculicollis*) and one NT species (African Clawless Otter *Aonyx capensis*). Dedicated searches for the species covered above will take place during summer fieldwork and will include the use of motion-triggered Bushnell Trailcam cameras.

5.2.2 Birds

Regional Context

The study area is situated within the Afrotropical Highlands biome as defined by Fishpool & Evans (2001). This biome is located in fragmented patches throughout the Afromontane belt of Africa and corresponds to the Grassland Biome in South Africa. Twenty-four species occurring in South Africa are listed by Barnes (1998) as being endemic to the biome, i.e. not occurring outside of the biome. Many of these are forest species that will not occur in the study area, and only one biome-restricted endemic (Southern Bald Ibis *Geronticus calvus*) has been

confirmed to occur in the same quarter-degree grids in which the study area is situated during the current Southern African Bird Atlas Project (SABAP2).

Kranskop 49-IT is situated along the eastern boundary of the Amersfoort – Bethal – Carolina District Important Bird Area (IBA) and the Chrissie Pans IBA is located to the south-east of the study area (Marnewick et al., 2015).

Species Richness

The quarter-degree grids 2629BB and 2630AA, in which the study area falls, currently have a combined list of 212 bird species recorded during the ongoing second Southern African Bird Atlas Project (SABAP2)⁵, a total probably approaching true species diversity for the district. SABAP2 data also indicate that 134 bird species have been recorded from the four pentads (mapping units) in which the study area is situated (2610_3000, 2605_3000, 2610_2955, 2605_2955) (Appendix 4). A pentad is a much smaller mapping unit than a quarter-degree grid, measuring approximately 77 km², and is thus a better indication of which species are likely to occur in the study area. However, none of the pentads listed above have been surveyed more than three times during SABAP2 and are thus significantly undersampled and likely to support more species than is currently indicated. Summer fieldwork will give a better indication of avian species richness within the study area. It is likely that at least three bird assemblages are present, namely a Grassland assemblage, Open Water assemblage and a Transformed (Cultivated Lands) assemblage. These assemblages will be described in more detail once summer fieldwork has been undertaken.

Species of Conservation Concern

Eight threatened bird species have been recorded in the quarter-degree grids in which the study area is situated, namely one CR species (Wattled Crane *Grus carunculatus*), two EN species (Grey Crowned Crane *Balearica regulorum*, Cape Vulture *Gyps coprotheres*) and five VU species (Southern Bald Ibis, Secretarybird *Sagittarius serpentarius*, White-bellied Korhaan *Eupodotis senegalensis*, Denham's Bustard *Neotis denhami* and African Grass Owl *Tyto capensis*). Five of these species have a moderate likelihood of occurring in the study area (Appendix 6) and will be searched for during summer fieldwork.

Five NT species have been recorded in the quarter-degree grids in which the study area is situated and have a moderate to high likelihood of being present in the study area (Appendix 6). Three of these are only likely to be recorded in open water habitat at Kranspan, namely

⁵ <http://sabap2.adu.org.za/> Accessed 13 November 2018

Maccoa Duck (*Oxyura maccoa*), Lesser Flamingo (*Phoeniconaias minor*) and Greater Flamingo (*Phoenicopterus roseus*), while two species are most likely to occur in untransformed grassland habitat, namely Blue Crane (*Grus paradiseus*) and Blue Korhaan (*Eupodotis caerulescens*).

Four additional species for which there are no records in the vicinity of the study area have a moderate likelihood of occurring (Appendix 6). One of these is classified as VU (Lanner Falcon *Falco biarmicus*), while the other three are NT (Chestnut-banded Plover *Charadrius pallidus*, Pallid Harrier *Circus macrourus*, Black-winged Pratincole *Glareola nordmanni*). A more thorough field analysis of habitat suitability will be undertaken during the wet season survey and each species will be dealt with in more detail in the updated report.

5.2.3 Herpetofauna (Reptiles and Amphibians)

Regional Context

The study area is situated within the Grassland biome, which is confined to the cool, high-lying plateau of eastern South Africa, Swaziland and Lesotho, as described by Mucina & Rutherford (2006). Numerous reptile and amphibian taxa are endemic to this biome, although the study area is situated in an area of moderate to low endemism, with 3 endemic reptile species per QDS (Bates et al., 2014) and 4-6 endemic frog species per QDS (Minter et al., 2004).

Species Richness

Thirty reptile species and 14 amphibian species have been recorded from the two QDSs in which the study area is located, with a mean of 20 reptile species and 12 amphibian species per QDS (Appendix 5). Given the relatively small size of the study area and low habitat heterogeneity, it is unlikely that this full list of species will be present in the study area. A more accurate estimate of species richness will be made after summer fieldwork has been completed.

Species of Conservation Concern

No reptile species of conservation concern as assessed by Bates et al. (2014) have been observed within the vicinity of the study area, while one species that has been regionally assessed by the MTPA as NT (Spotted Harlequin Snake *Homoroselaps lacteus*) has been recorded in 2629BB (Appendix 5). Three additional NT reptiles have been recorded in other QDSs in the general vicinity of the study area (Coppery Grass Lizard *Chamaesaura aenea*, Large-scaled Grass Lizard *C. macrolepis*, Striped Harlequin Snake *Homoroselaps dorsalis*), but these have a low likelihood of being present in the study area (Appendix 6).

No amphibian species of conservation concern have been recorded from the vicinity of the study area, although one species has a low likelihood of occurring, namely Giant Bullfrog (*Pyxicephalus adspersus*), which has been classified as NT and is a protected species under NEMBA (2004). This species breeds in shallow temporary pans which are present within the study area and adjacent properties, but is very rare on the eastern Highveld and there are no recent records from the relevant QDSs.

5.3 ECOLOGICAL SENSITIVITY ANALYSIS

A full sensitivity analysis of each of the vegetation communities represented in the study area will be presented once fieldwork has been completed. This will be done using the methodology described in section 4. Conservation Value (CV), which is an important component of the ES analysis, can only be calculated once field data have been collected and habitat state assessed. In the interim, the classification of land units in the Mpumalanga Biodiversity Sector Plan (MBSP) (Lötter *et al.*, 2014) will be used as a surrogate for ES. Figure 4 shows the MBSP classification of land units within the study area.

All of the Natural Habitat (untransformed vegetation) within the study area falls within Critical Biodiversity Areas (CBAs) according to the MBSP (Lötter *et al.*, 2014). Just over half of the untransformed grassland in the study area (736 ha) has been classified as **CBA: Irreplaceable**, while the pans, riparian wetlands and other grassland have been classified as **CBA: Optimal**. These are the most sensitive habitats in the study area and represent the areas where impacts on ecology would be most significant.

All the transformed areas, such as cultivated lands, are classified as either Heavily Modified or Moderately Modified: Old Lands.

Critical Biodiversity Areas are areas that are essential for meeting biodiversity targets for species, ecosystems or ecological processes. The desired management objectives for CBAs are that they be **kept in a natural or near-natural state, with no further loss of habitat or species**. Only low-impact, biodiversity-sensitive land-uses such as low-intensity livestock grazing are considered appropriate, while land-uses such as any form of mining or prospecting, conversion of natural habitat for agriculture or plantation forestry, expansion of existing settlements or infrastructure, and the building of new infrastructure or linear developments such as roads, railways, pipelines, etc., **are considered inappropriate**. Areas falling within the Modified category are the preferred areas for a wide variety of land-use types, which includes mining development.

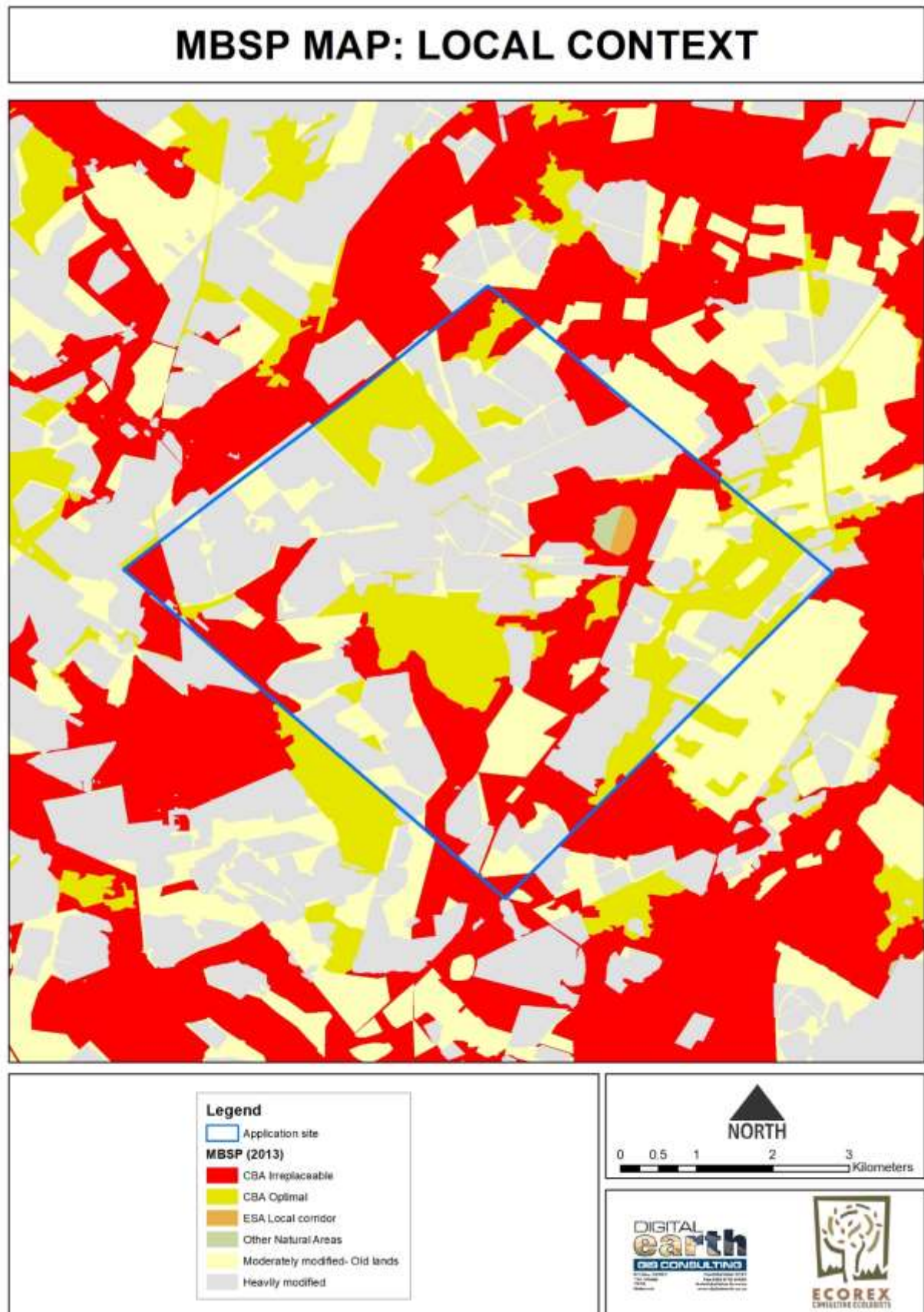


Figure 4. MBSP Classification of land units within and adjacent to the study area

6. KEY POTENTIAL IMPACTS

6.1 FLORA

During the preparation and construction phases it is possible that areas of natural habitat will be cleared during the creation of open-cast pits, creating or widening of access roads to the infrastructure, etc. Habitat loss is also likely to take place during operation of the open pit.

The following key impacts to flora have been identified:

6.1.1 Disturbance or loss of an Endangered vegetation type and listed Threatened Ecosystem as well as associated populations of Species of Conservation Concern

Parts of the study area that comprise undisturbed Natural Habitat, i.e. untransformed grassland and wetlands, are likely to be lost with the development of open cast pits and associated infrastructure. These are the habitats in which species of conservation concern are most likely to occur and thus populations of these species are likely to also be impacted. The location of infrastructure and open pits within these habitats will significantly increase the severity of this impact.

6.1.2 Introduction/proliferation of alien invasive species

Areas of exposed soil created through construction activities could provide a platform for alien invasive species to become established. This is specifically relevant along cleared road verges. From the preparation phase, through construction and operation, the various vehicles and equipment entering the site will enhance the risk of these alien species being introduced to the project area.

6.1.3 Illegal utilisation of flora resources

It is likely that a number of traditional medicinal plants occur in Natural habitat in the study area. The influx of labour teams during the construction phase could result in an increase in illegal harvesting of medicinal plants by contractors. It is assumed that any labour teams will be accommodated in nearby towns and not on site, which would lower this risk considerably.

6.2 FAUNA

The following key impacts to fauna have been identified:

6.2.1 Disturbance/loss of threatened faunal habitat and associated Species of Conservation Concern

Over 50% of the study area comprises Natural Habitat that is regarded as threatened, and this habitat is likely to support faunal assemblages with populations of species of conservation concern. The development of open cast pits and associated infrastructure could result in some loss of this habitat and displacement or even mortalities of some faunal species of conservation concern. The location of infrastructure within Natural Habitat will significantly increase the severity of this impact.

6.2.2 Illegal utilisation of faunal resources

The presence of a labour force within the study area will increase the risk of illegal utilisation of fauna resources, such as hunting of small antelope and trapping of small mammals. The frequency of the disturbing activities will be throughout the life of the operation. It is assumed that any labour teams will be accommodated in nearby towns and not on site, which would lower this risk considerably.

7. RECOMMENDATIONS – FIELDWORK PHASE

The need for biodiversity data collection within the study area has been highlighted throughout this report. This should ideally take place in the summer, during the peak rainfall period (Feb-Apr), although a follow up survey to confirm the presence or absence of plant species of conservation concern will be need from October to November 2019 and will fulfil the MTPA minimum requirements for specialist surveys in sensitive habitats. The following fieldwork methods will be followed during the fieldwork phase:

7.1 FLORA

The primary field survey method for the floristic biodiversity study will be Timed-meander Transects, a semi-quantitative method that focused on the location of plant species of conservation concern (Goff *et al.*, 1982; Huebner, 2007). The method has been shown to be highly effective and time efficient in detecting rare species and documenting α -diversity (Huebner, 2007). Approximately 20 minutes will be spent searching all available habitats at each site, although highly diverse habitats will occasionally require more time while sites situated in transformed habitats with secondary vegetation will require less time. Inventories of identifiable vascular plants will be made at each of the sites visited, recording presence/absence, as well as estimating dominance/cover-abundance according to Braun-Blanquet cover scales (Kent & Coker, 1992). Where plants cannot be identified in the field, specimens will be collected and dried in a plant press for later identification.

7.2 MAMMALS

Standard small mammal survey techniques will be employed for surveying rodents. At each site, traps will be set along a transect (trapline) and will be left out for several consecutive nights. Locations of traplines will be selected to cover as many different microhabitats as possible. Traplines will consist of 10 trap stations, with one Sherman live trap per station; trap stations will be approximately 5 m apart. Traps will be baited in the late afternoon and will be checked shortly after sunrise each morning. Motion-triggered Bushnell TrailCam cameras will be installed at sites of focused large mammal activity, such as paths, waterholes and saltlicks. These sites will be baited with small amounts of canned pilchards.