

**ECOLOGICAL  
IMPACT  
ASSESSMENT**

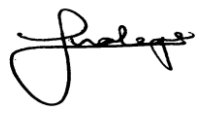


**FOR THE PROPOSED CEMETERY ON PORTION 0 OF FARM  
JERUSALEM 1757, MANGAUNG MUNICIPALITY IN FREE STATE  
PROVINCE**



Prepared for:  
Nali Sustainability Solutions (Pty) Ltd  
65 Country Club Drive, Irene Farm Villages  
Centurion  
Tel: (012) 676 8315  
E-mail: [ncube.nali@gmail.com](mailto:ncube.nali@gmail.com)

Prepared by:  
MATAVHA Environmental (Pty) Ltd  
6393 Silvera Street, Soshanguve Block VV6  
Pretoria  
Cell: (072) 688 7758  
E-mail: [lutendo@matavha.com](mailto:lutendo@matavha.com)

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AUTHORS	MOKGATLA MOLEPO <i>PR. NAT. SCI</i> (009509)	
	LUTENDO NDOU <i>PRI. NAT. SCI</i> (127690)	
	RAMOKONE MOTHWA (SAAB)	

## Project Team

Table 1: Project Team

Project Role	Name	Qualifications
Floral Specialist	Ramokone Mothwa	BSc. Botany & Microbiology (University of Venda), BSc. Hons. Botany (University of Limpopo) MSc. Botany (University of Pretoria – Current)
Ecologist & Faunal Specialist	Mokgatla Molepo	BSc. Botany & Zoology (University of Venda), BSc. Hons. Zoology (University of Limpopo) MSc. Zoology (Nelson Mandela University)
Project Manager and Wetland Specialist	Ndou L	BES (Hon) Mining and Environmental Geology (University of Venda)

## **EXECUTIVE SUMMARY**

Matavha Environmental (Pty) Ltd was appointed by Nali Sustainability Solutions (Pty) Ltd to conduct an Ecological Impact Assessment as part of Environmental Authorisation for the proposed cemetery in Tiepoort outside Bloemfontein City within Mangaung Metropolitan Municipality in Free State Province.

The site is an open grassland with few shrubs scattered around, and two streams within the site that make a confluence which feeds into Tiepoort River. There are also few residential houses including a school and a police station.

The site was investigated to determine the potential impacts which may result from the proposed activities.

The site is located between a rural settlement and farms and below are the existing impacts that have been identified.

- Presence of Invasive Alien Plants
- Solid and Wet Waste

No Floral species of conservation concern (SCC) were observed within the study area.

Ecological Assessment revealed that the majority of the vegetation located west of the site has been exposed to minimal disturbance. As a result, the proposed activities may impact negatively the ecological integrity of the habitats located west of the site.

The management of the impacts as well as recommendations were developed for the current and potential impacts identified. The recommendations and mitigations will need to be strictly adhered to.

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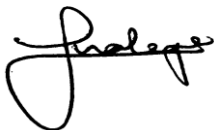
## DECLARATION OF INDEPENDENCE

I, Mokgatla Molepo, in my capacity as a lead specialist consultant, hereby declare that I:

- Act/acted as an independent specialist to Nali Sustainability Solutions (Pty) Ltd for this project.
- Do not have any personal, business, or financial interest in the project except for financial remuneration for specialist investigations completed in a professional capacity as specified by the Environmental Impact Assessment Regulations, 2017.
- Will not be affected by the outcome of the environmental process, of which this report forms part of.
- Do not have any influence over the decisions made by the governing authorities.
- Do not object to or endorse the proposed developments but aim to present facts and my best scientific and professional opinion regarding the impacts of the development.
- Undertake to disclose to the relevant authorities any information that has or may have the potential to influence its decision or the objectivity of any report, plan or document required in terms of the Environmental Impact Assessment Regulations, 2017.

## INDEMNITY

- This report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken.
- This report is based on a desktop investigation using available information and data related to the site to be affected, *in situ* fieldwork, surveys and assessments and the specialists best scientific and professional knowledge.
- The Precautionary Principle has been applied throughout this investigation.
- The findings, results, observations, conclusions, and recommendations given in this report are based on the specialist's best scientific and professional knowledge as well as information available at the time of study.
- Additional information may become known or available during a later stage of the process for which no allowance could have been made at the time of this report.
- The specialist reserves the right to modify this report, recommendations and conclusions at any stage should additional information become available.
- Information and recommendations in this report cannot be applied to any other area without proper investigation.
- This report, in its entirety or any portion thereof, may not be altered in any manner or form or for any purpose without the specific and written consent of the specialist as specified above.
- Acceptance of this report, in any physical or digital form, serves to confirm acknowledgement of these terms and liabilities.



Mokgatla Molepo *Pr. Nat. Sci* (009509)

16 November 2021

## **1. INTRODUCTION AND PROJECT LOCATION AND DESCRIPTION**

Matavha Environmental (Pty) Ltd has been appointed as independent specialist to undertake an ecological impact assessment as part of Environmental Authorisation for the proposed cemetery in Tiepoort outside Bloemfontein City within Mangaung Metropolitan Municipality in Free State Province. (Fig. 1). The study site is located within a rural settlement of Tiepoort and it is approximately 2 km west of the N1 National Route.

The ecological sensitivity of the entire study area was assessed, however, during the field survey, the ecological impacts were narrowed down to the receiving environment. The investigation determined how several habitats and biota will be affected by the proposed cemetery and associated activities. The significance ratings of the anticipated impacts were evaluated, and recommendations and deductions were made.

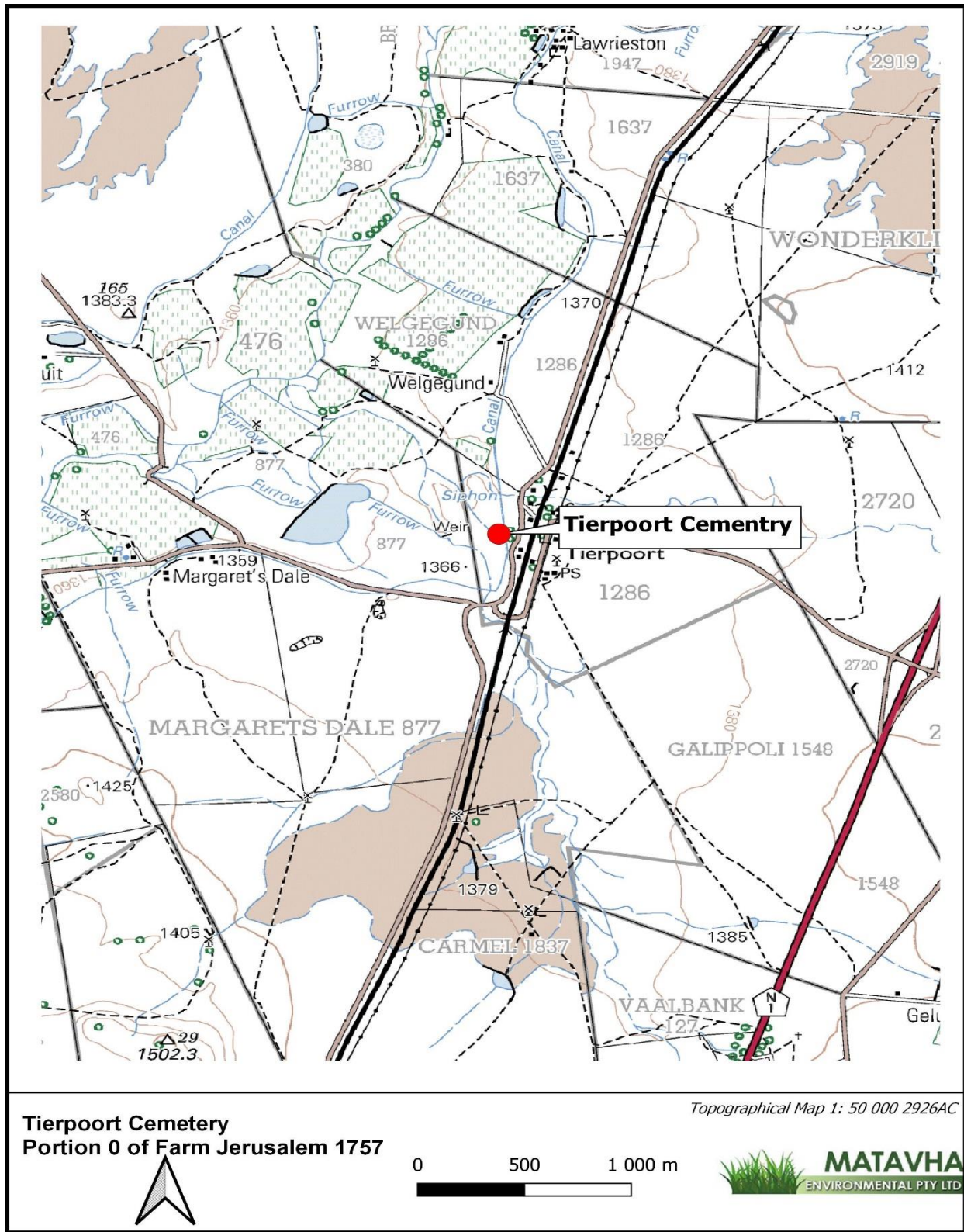


Figure 1: Location of the study site.



## **2. TERMS OF REFERENCES**

The study was undertaken following these Terms of Reference:

- Provide a broad-scale map of the vegetation of the site.
- Describe dominant and characteristic species within the broad-scale plant communities.
- Provide a list of Red Data plant and animal species previously recorded within the site which the study area is situated, obtained from the relevant authorities and literature reviews.
- Identification of sensitive habitats and plant communities.
- Preliminary investigation of the impacts of the project; and
- Recommend practicable mitigation measures to minimize or eliminate negative impacts and or enhance potential project benefits.

## **3. ASSUMPTIONS, LIMITATIONS, UNCERTAINTIES, AND GAP ANALYSIS**

The findings, results, observations, conclusions, and recommendations provided in this report are based on the author's best scientific and professional knowledge as well as available information regarding the perceived impacts on terrestrial environment.

A description of vegetation was based on the physical field surveys and site walkthrough and investigations as performed on site. Limited time and access to other private properties was a constraint during field surveys.

The site assessment did not include the adjacent properties.

Results presented in this report are based on a snapshot investigation of the study site and not on detailed and long-term investigations of all environmental attributes and the varying degrees of biological diversity that may be present in the study site.

Once-off assessments such as this may potentially miss certain ecological information, thus limiting accuracy, detail, and confidence.

The assessment of impacts and recommendation of mitigation measures were informed by the site-specific ecological issues arising from the field survey and based on the assessor's working knowledge and experience with similar projects.

## 4. SURVEY METHODS AND REPORTING

### 4.1. General

The report relies on aerial images and ortho photos to gather background information on a variety of features and vegetation communities occurring on the study site. On site data was collected by a walkthrough in November 2021 that covered the whole study site. All literature used in this study is listed in the reference section. Survey walks are displayed below in black, red and pink colours.



### 4.2. Climate

The climate in this area is influenced by the local steppe climate. There is not much rainfall all year long. The climate here is classified as BSk by the Köppen-Geiger system. The average annual temperature is 17.1 °C. In a year, the rainfall is 545 mm (Fig. 2).

According to Köppen -Geiger system (Kottek *et al.* 2006), the study site falls within the BSk climatic region (Fig. 3).

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature °C	23.4 °C	22.5 °C	20.6 °C	16.2 °C	12.5 °C	9 °C	8.9 °C	12 °C	16.2 °C	19.4 °C	21.2 °C	22.9 °C
(°F)	(74.1) °F	(72.5) °F	(69) °F	(61.2) °F	(54.6) °F	(48.2) °F	(48) °F	(53.5) °F	(61.2) °F	(67) °F	(70.2) °F	(73.1) °F
Min. Temperature °C (°F)	16.8 °C (62.2) °F	16.3 °C (61.3) °F	14.3 °C (57.8) °F	10 °C (50) °F	5.9 °C (42.7) °F	2.3 °C (36.1) °F	1.6 °C (35) °F	4 °C (39.3) °F	7.8 °C (46.1) °F	11.3 °C (52.4) °F	13.4 °C (56.1) °F	15.7 °C (60.2) °F
Max. Temperature °C	30.2 °C	29.1 °C	27.2 °C	22.9 °C	19.7 °C	16.6 °C	16.9 °C	20.1 °C	24.4 °C	27.3 °C	28.8 °C	30 °C
(°F)	(86.3) °F	(84.3) °F	(81) °F	(73.2) °F	(67.4) °F	(61.8) °F	(62.4) °F	(68.2) °F	(75.9) °F	(81.1) °F	(83.8) °F	(86.1) °F
Precipitation / Rainfall	85	75	76	50	21	12	9	16	16	44	65	76
mm (in)	(3.3)	(3)	(3)	(2)	(0.8)	(0.5)	(0.4)	(0.6)	(0.6)	(1.7)	(2.6)	(3)
Humidity(%)	45%	49%	51%	54%	52%	52%	44%	36%	29%	32%	35%	40%
Rainy days (d)	9	8	7	6	3	2	1	2	2	5	6	8
avg. Sun hours (hours)	11.5	11.0	10.1	9.3	9.0	8.7	9.1	9.6	10.4	11.1	11.6	11.8

Figure 2: Climatic figures of the region.

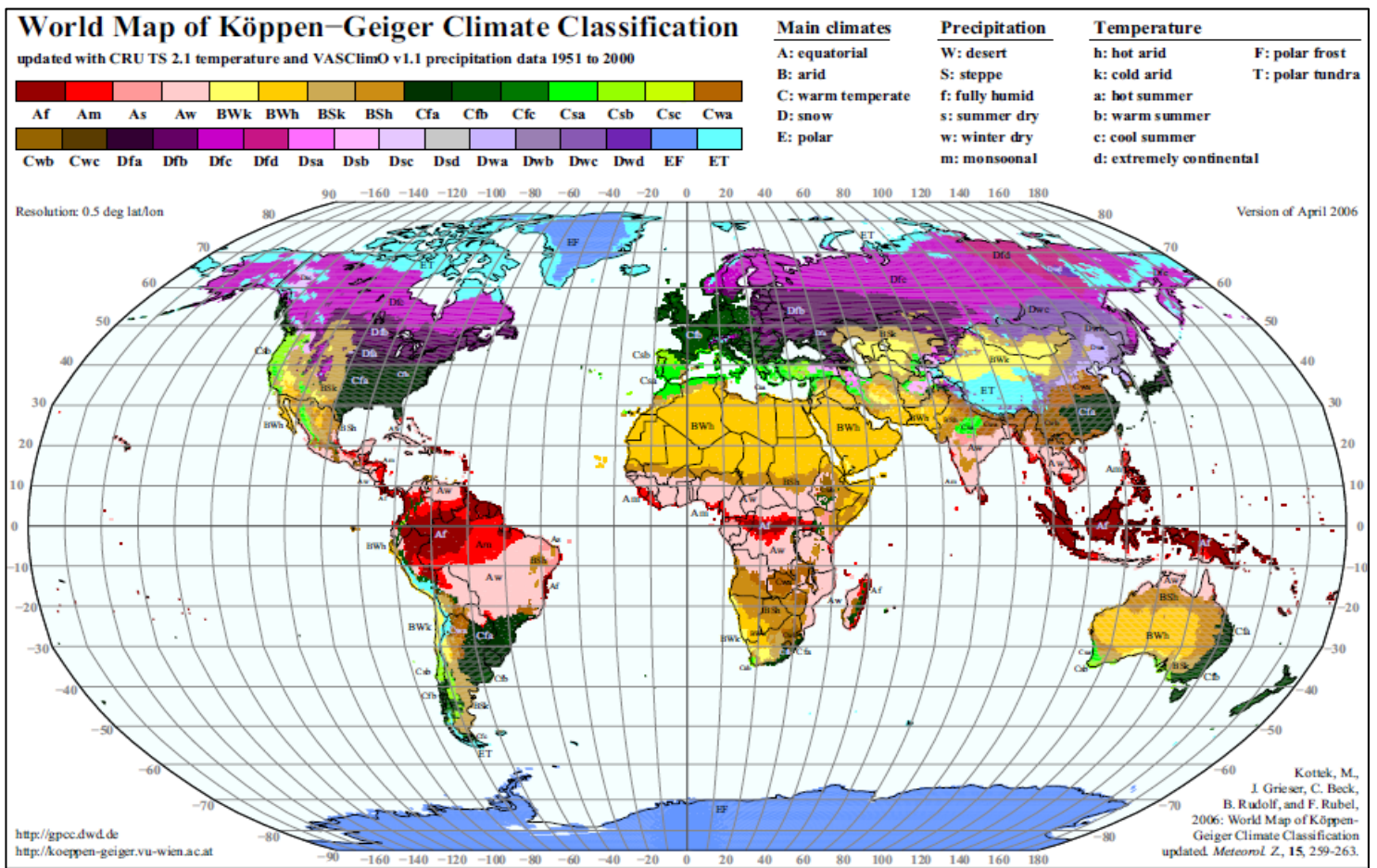


Figure 3: World map of Köppen -Geiger Climate Classification.

### **4.3. Vegetation of the study site**

Floral diversity was determined by completing site walkthrough throughout the site to assess the vegetation status and composition. The vegetation units of Mucina and Rutherford (2006) were used as references but where necessary communities are named according to the recommendations of a standardized South African Syntaxonomic nomenclature system. By combining the available literature with the survey results, stratification of vegetation communities was possible.

The aim was to identify distinct vegetation types and to establish their integrity and representation in the study area. The veld types are described on a local level.

#### **Vegetation types and biophysical descriptions**

Vegetation units are broadly classed and may include several distinct vegetation communities within a unit. The study site falls within the Grassland Biome and the vegetation type found on the study site is Xhariep Karroid Grassland (Fig. 4).

#### **Xhariep Karroid Grassland**

##### **Distribution**

This vegetation is found in Free State Province and very slightly into the Northern Cape Province: Southern regions including the vicinity of Luckhoff (west), Edenburg (north), Gariiep Dam (south) and Smithfield (east). Altitude 1 260–1 560 m.

##### **Vegetation & Landscape Features**

Extensive, even or slightly undulating bottomland flats forming a matrix of large landscape patches interrupted by high dolerite sills, koppies and conspicuous ring dykes (bearing Gh 4 Besemkaree Koppies Shrubland) and supporting low- to medium-height, open grassland intermingled with small patches of dwarf karroid shrubs. The grass element becomes more visible, especially in summer, particularly in years of high precipitation. The open grassland intermingled with patches of dwarf karroid shrubs resembles the physiognomy of the Gh 2 Aliwal North Dry Grassland, although many of the species show a greater affinity for the slightly lower rainfall than in the latter grassland unit. Low cover of grasses such as *Themeda triandra*, *Cymbopogon pospischilii* and *Digitaria eriantha* is indicative of the relatively low rainfall. In years of low precipitation, dwarf karroid shrubs become more prominent and barren patches of soil become more visible, especially during the winter months and early spring.

##### **Geology & Soils**

Alternating layers of mudstone and sandstone mostly of the Permian Adelaide Subgroup (Beaufort Group, Karoo Supergroup). Part of the area is covered with soils with diagnostic

pedocutanic and prisma-cutanic (dark clayey) B-horizons and belongs to soil forms such as Estcourt, Rensburg and Oakleaf. In some areas, especially towards the more arid west, patches of calcrete on the soil surface are notable—here the soil forms such as Kimberley and Plooyburg prevail (dwarf karroid shrubs usually concentrate on these areas of limestone-rich patches). The entire area has been classified as Da or Db land types.

### Important Taxa

Graminoids: *Aristida adscensionis* (d), *A. canescens* (d), *A. congesta* (d), *Chloris virgata* (d), *Cynodon incompletus* (d), *Eragrostis chloromelas* (d), *E. lehmanniana* (d), *E. obtusa* (d), *Fingerhuthia africana* (d), *Panicum coloratum* (d), *P. stapfianum* (d), *Themeda triandra* (d), *Tragus koelerioides* (d), *Aristida diffusa*, *Cymbopogon pospischilii*, *Digitaria eriantha*, *Eragrostis curvula*, *Sporobolus fimbriatus*. Herbs: *Gazania krebsiana* subsp. *krebsiana* (d), *Convolvulus boedeckerianus*, *Dimorphotheca zeyheri*, *Hermannia coccocarpa*, *Indigofera alternans*, *Lepidium africanum* subsp. *africanum*, *Lessertia pauciflora*, *Rumex lanceolatus*, *Salvia stenophylla*, *Selago densiflora*. Geophytic Herbs: *Moraea pallida* (d), *Oxalis depressa*. Succulent Herb: *Tripteris aghillana* var. *integrifolia*. Low Shrubs: *Chrysocoma ciliata* (d), *Eriocephalus ericoides* (d), *E. spinescens* (d), *Felicia filifolia* subsp. *filifolia* (d), *F. muricata* (d), *Pentzia globosa* (d), *P. incana* (d), *Amphiglossa triflora*, *Aptosimum elongatum*, *Atriplex semibaccata* var. *appendiculata*, *Berkheya annectens*, *Gnidia polycephala*, *Helichrysum asperum* var. *albidulum*, *H. dregeanum*, *H. lucilioides*, *Lycium cinereum*, *Melolobium candicans*, *Nenax microphylla*, *Oligomeris dregeana*, *Osteospermum spinescens*, *Rosenia humilis*, *Selago saxatilis*, *Wahlenbergia albens*, *W. nodosa*. Succulent Shrubs: *Euphorbia clavarioides* var. *clavarioides*, *Hertia pallens*, *Ruschia hamata*, *R. rigida*, *Salsola calluna*, *S. glabrescens*. Tall Shrub: *Rhus ciliata*.

### Endemic Taxa

Herb: *Manulea flanagani*. Succulent Shrubs: *Phyllobolus rabiei*, *Ruschia calcarea*.

**Conservation** This vegetation is Least threatened. Conservation target is 24%. About 2.5% is statutorily conserved in Gariep Dam, Tussen Die Riviere, Kalkfontein Dam, Oviston, Wurasdam and Rolfontein Nature Reserves. Some 4% already transformed by cultivation and dam-building (Bethulie, Gariep, Kalkfontein, Straussfontein and Tierpoort Dams). This dry grassland is prone to encroachment of low, unpalatable karroid shrubs when exposed to heavy grazing. Erosion moderate (71%) and low (19%).

**Remarks** Xhariep Karroid Grassland occupies a central position along a rainfall gradient between Gh 5 Bloemfontein Dry Grassland (to the north) and dwarf karroid shrub-dominated NKu 4 Eastern Upper Karoo (to the south). Most of the unit was viewed by Acocks (1953) as a karoo type of vegetation that had originally been grassland.

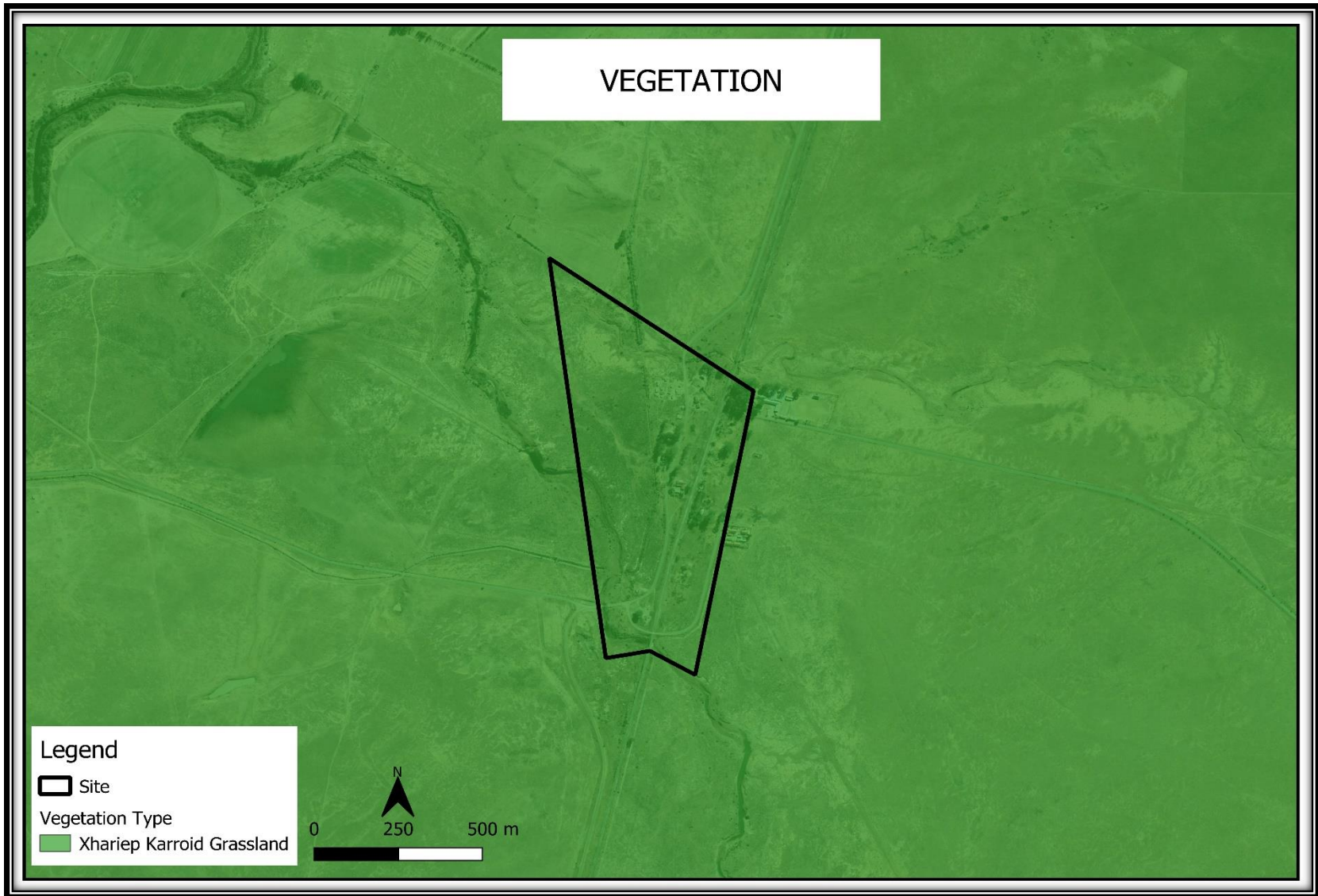


Figure 4: Vegetation map of the study site.

## **5. LEGAL REQUIREMENTS**

### **The Constitution of the Republic of South Africa Act (Act No. 108 of 1996) – Section 24.**

The Constitution is South Africa's overarching law. It prescribes minimum standards with which existing and new laws must comply. Chapter 2 of the Constitution contains the Bill of Rights in which basic human rights are enshrined. Government's commitment to give effect to the environmental rights enshrined in the Constitution is evident from the enactment of various pieces of environmental legislation since 1996, including the National Water Act, the National Environmental Management Act, etc.

### **National Environmental Management Act (Act No. 107 of 1998) (NEMA), as amended.**

NEMA replaces several the provisions of the Environment Conservation Act, 1989 (Act No. 73 of 1989). The Act provides for cooperative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote cooperative governance and procedures for coordinating environmental functions. The principles enshrined in NEMA guide the interpretation, administration, and implementation of the Act with regards to the protection and or management of the environment. These principles serve as a framework within which environmental management must be formulated. Section 2(4) specifies that "sustainable development requires the consideration of all relevant factors including aspects specifically relevant to biodiversity":

### **National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA).**

NEMBA provides for the management and conservation of biological diversity and components thereof; the use of indigenous biological resources in a sustainable manner; the fair and equitable sharing of benefits rising from bioprospecting of biological resources; and cooperative governance in biodiversity management and conservation within the framework of NEMA.

### **National Water Act (Act No. 36 of 1998) (NWA).**

The National Water Act (NWA) is a legal framework for the effective and sustainable management of water resources in South Africa. Central to the NWA is recognition that water is a scarce resource in the country which belongs to all the people of South Africa and needs to be managed in a sustainable manner to benefit all members of society. The NWA places a strong emphasis on the protection of water resources in South Africa, especially against its exploitation, and the insurance that there is water for social and economic development in the country for present and future generations.

The National Water Act, requires any development to secure Water Use Licences with the following activities:

Section 21 (a), abstractive use of water for construction (if possible and required).

Section 21 (c) and (i) use, i.e., river or wetland crossings, which includes any drainage lines by any infrastructure.

In terms of the definitions provided, activities included under Sections 21(c) and 21(i) are (amongst others) the construction of roads, bridges, pipelines, culverts and structures for slope stabilisation and erosion protection. DWS will however need to be approached to provide guidance on whether approval for Section 21 (c) and (i) water uses would be required.

### GENERAL AUTHORISATION IN TERMS OF SECTION 39 OF THE NWA

According to the preamble to Part 6 of the NWA, “This Part established a procedure to enable a responsible authority, after public consultation, to permit the use of water by publishing general authorisations in the Gazette...” “The use of water under a general authorisation does not require a licence until the general authorisation is revoked, in which case licensing will be necessary...”

The General Authorisations for Section 21 (c) and (i) water uses (impeding or diverting flow or changing the bed, banks, or characteristics of a watercourse) as defined under the NWA have recently been revised (Government Notice R509 of 2016). Determining if a water use licence is required for these water uses is now associated with the risk of degrading the ecological status of a watercourse. A low risk of impact could be authorised in terms of a General Authorisations (GA).

### **CMS**

The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or Bonn Convention) aims to conserve terrestrial, aquatic, and avian migratory species throughout their range. It is an intergovernmental treaty, concluded under the aegis of the United Nations Environment Programme, concerned 22 with the conservation of wildlife and habitats on a global scale. Since the Convention's entry into force, its membership has grown steadily to include 117 (as of 1 June 2012) Parties from Africa, Central and South America, Asia, Europe, and Oceania. South Africa is a signatory to this convention.

### **AEWA**

The African-Eurasian Waterbird Agreement. The Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) is the largest of its kind developed so far under the CMS. The AEWA covers 255 species of birds ecologically dependent on wetlands for at least part of their annual cycle, including many species of divers, grebes, pelicans, cormorants, herons, storks, rails, ibises, spoonbills, flamingos, ducks, swans,



geese, cranes, waders, gulls, terns, tropic birds, auks, frigate birds and even the South African penguin. The agreement covers 119 countries and the European Union (EU) from Europe, parts of Asia and Canada, the Middle East and Africa.

### **Provincial legislation**

In addition to national legislation, some of South Africa's nine provinces have their own provincial biodiversity legislation, as nature conservation is a concurrent function of national and provincial government in terms of the Constitution (Act 108 of 1996).

### **Free State Biodiversity Plan**

Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. In other words, if these areas are not maintained in a natural or near-natural state then biodiversity targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses.

Ecological Support Areas (ESAs) are terrestrial and aquatic areas that are not essential for meeting biodiversity representation targets (thresholds), but which nevertheless play an important role in supporting the ecological functioning of critical biodiversity areas and or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration. The degree or extent of restriction on land use and resource use in these areas may be lower than that recommended for CBAs.

### **Sensitivity Analysis**

In terms of Free State Biodiversity Sector Plan, the entire site falls within Ecological Support Area, but upon site assessment, a site sensitivity map was produced (see Fig. 5). This is to guide the developer in terms of no go areas.

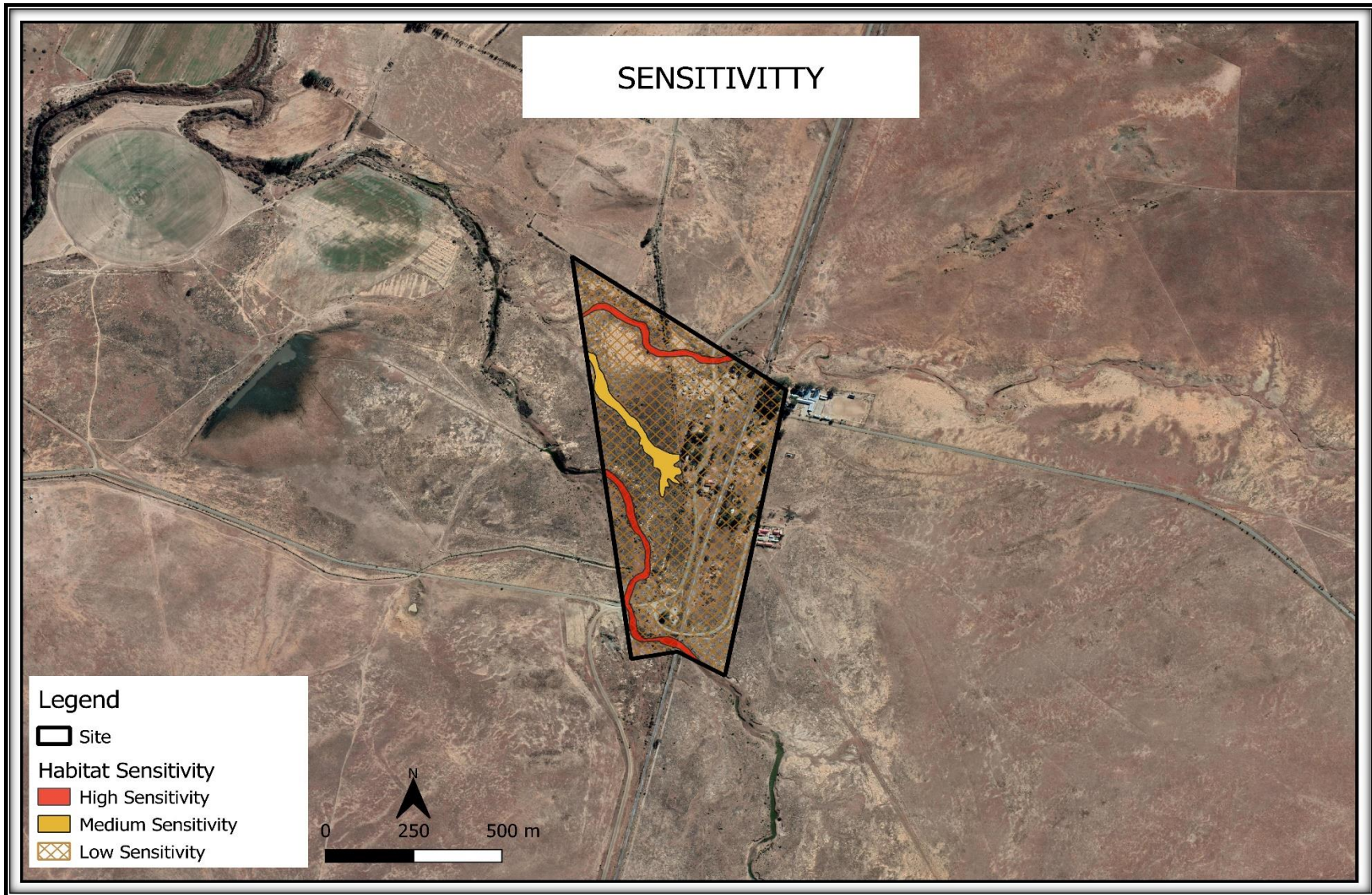


Figure 5: Site sensitivity of the site.

## 6. RED DATA ANALYSIS

South African National Biodiversity Institute (SANBI) Red List website was used to determine the conservation status of the species. This is done to conserve sensitive species and their immediate environment. The status is determined in Table 2 below.

Table 2: Red Data Status definitions (SANBI, 2010).

<i>p- protected Species</i>		
<i>M- Medicinal species</i>		
<b>EX</b>	<b>Extinct</b>	A taxon is Extinct when there is no reasonable doubt that the last individual has died. Taxa should be listed as extinct only once exhaustive surveys throughout the historic range have failed to record an individual.
<b>EW</b>	<b>Extinct in the Wild</b>	A taxon is Extinct in the Wild when it is known to survive only in cultivation or as a naturalized population (or populations) well outside the past range.
<b>CR PE</b>	<b>Critically Endangered (Possibly Extinct)</b>	Critically Endangered (Possibly Extinct) taxa are those that are, on the balance of evidence, likely to be extinct, but for which there is a small chance that they may be extant. Hence, they should not be listed as Extinct until adequate surveys have failed to record the taxon.
<b>CR</b>	<b>Critically Endangered</b>	A taxon is Critically Endangered when the best available evidence indicates that it meets any of the five IUCN criteria for Critically Endangered and is therefore facing an extremely high risk of extinction in the wild.
<b>EN</b>	<b>Endangered</b>	A taxon is Endangered when the best available evidence indicates that it meets any of the five IUCN criteria for Endangered and is therefore facing a very high risk of extinction in the wild.
<b>VU</b>	<b>Vulnerable</b>	A taxon is Vulnerable when the best available evidence indicates that it meets any of the five IUCN criteria for Vulnerable and is therefore facing a high risk of extinction in the wild.
<b>NT</b>	<b>Near Threatened</b>	A taxon is Near Threatened when available evidence indicates that it nearly meets any of the five IUCN criteria for Vulnerable and is therefore likely to qualify for a threatened category soon.
<b>CRITICALLY RARE</b>		A taxon is Critically Rare when it is known to occur only at a single site but is not exposed to any direct or plausible potential threat and does not qualify for a category of threat according to the five IUCN criteria.
<b>RARE</b>		A taxon is Rare when it meets any of the four South African criteria for rarity but is not exposed to any direct or plausible potential threat and does not qualify for a category of threat according to the five IUCN criteria.

<b>DECLINING</b>		A taxon is Declining when it does not meet any of the five IUCN criteria and does not qualify for the categories Critically Endangered, Endangered, Vulnerable or Near Threatened, but there are threatening processes causing a continuing decline in the population.
<b>DDD</b>	<b>Data Deficient— Insufficient Information</b>	A taxon is DDD when there is inadequate information to assess its risk of extinction, but the taxon is well defined. Data Deficient is not a category of threat. However, listing of taxa in this category indicates that more information is required, and that future research could show that a threatened classification is appropriate.
<b>LC</b>	<b>Least Concern</b>	A taxon is Least Concern when it has been evaluated against the five IUCN criteria and does not qualify for the categories Critically Endangered, Endangered, Vulnerable or Near Threatened, and it is not rare, and the population is not declining.

### **Ecological function**

Ecological function relates to the degree of ecological connectivity between systems within a landscape matrix. Therefore, systems with a high degree of landscape connectivity amongst one another are perceived to be more sensitive and will be those contributing to ecosystem service (for example wetlands) or overall preservation of biodiversity. Conservation importance relates to species diversity, endemism (unique species or unique processes) and the high occurrence of threatened and protected species or ecosystems protected by legislation.

### **Sensitivity scale**

- **High ecological function:** Sensitive ecosystems with either low inherent resistance or resilience towards disturbance factors or highly dynamic systems considered to be stable and important for the maintenance of ecosystems integrity for example pristine grasslands, pristine wetlands, and pristine ridges.
- **Medium ecological function:** Relatively important ecosystems at gradients of intermediate disturbances. An area may be considered of medium ecological function if it is directly adjacent to sensitive/pristine ecosystem.
- **Low ecological function:** Degraded and highly disturbed systems with little or no ecological function.

- **No Go Areas:** Areas that have irreplaceable biodiversity or important ecosystem function values which may be lost permanently if these ecosystems are transformed, with a high potential of also affecting adjacent and or downstream ecosystems negatively

### **Conservation status of the vegetation**

- **High conservation importance:** Ecosystems with high species richness which usually provide suitable habitat for several threatened species. Usually termed 'no-go' areas and unsuitable for development and should be conserved.
- **Medium conservation importance:** Ecosystems with intermediate levels of species diversity without any threatened species. Low-density development may be accommodated, provided the current species diversity is conserved.
- **Low conservation importance:** Areas with little or no conservation potential and usually species poor (most species are usually exotic).

The system ecological function is Low-Medium due to intact vegetation and watercourses within the sites.

## 7. RESULTS

Biological diversity everywhere is at great risk as a direct result of an ever-expanding human population and its associated needs for energy, water, food, and minerals. Landscape transformation that is needed to accommodate these activities inevitably leads to habitat loss and habitat fragmentation, resulting in the mosaical appearance of undisturbed habitat within a matrix of transformed areas. These remaining areas of natural habitat are frequently too small to support the biodiversity that previously occupied the area, and the region loses its ecological integrity (Kamffer 2004).

Although the proposed cemetery will be located in a rural settlement which has undergone habitat transformation, there are still parts of the site which are intact and should be avoided. These areas are located on the west of the site are associated with the watercourses.



Figure 6: Sensitivity areas within the site.



Figure 7: Transformed areas within the site; houses and stands of Eucalyptus.

Below are tables containing species recorded on site during the survey. It should be noted that no mammals or herpetofauna were recorded during the survey. Historical faunal records are listed in the appendix.

### 7.1. Plants

The vegetation near the residential houses has been transformed, whereas the vegetation towards the west of the site is still intact. One of the concerns is the presence of alien plants and illegal dumping of carcass and other solid waste.

Table 3: Plant species observed at the study area.

Species	Common Name	Growth Form	IUCN Conservation Status
<i>Setaria sphacelata</i>	Common Bristle Grass	Grass	LC
<i>Hyparrhenia hirta</i>	Common Thatching Grass	Grass	LC
<i>Aristida congesta</i>	Tassel Three-awn	Grass	LC
<i>Cynodon dactylon</i>	Couch Grass	Grass	LC
<i>Themeda triandra</i>	Red Grass	Grass	LC
<i>Eragrostis racemosa</i>	Narrow-heart Love Grass	Grass	LC

<i>Asparagus larycinus</i>	Bergkatbos	Shrub	LC
<i>Knophofia uvaria</i>	Cape red hot poker	Succulent herb	LC
<i>Searsia ciliata</i>	Sour karee	Tree	LC

## 7.2. Weeds and Invasive Plants

The presence of several weeds and poor-quality species strongly reflects the transformed and degraded nature of the study site. The site has low levels of infestation. The following weeds and invasive plant taxa were recorded within the study site (Table 4).

Table 4: Plant species observed at the study area.

Species	Common Name	Growth Form	Category
<i>Eucalyptus camaldulensis</i>	River red gum	Tree	Declared Category 1b
<i>Populus alba</i>	White poplar	Tree	Declared Category 2
<i>Opuntia ficus indica</i>	Sweet prickly pear	Succulent	LC
<i>Cylindropuntia imbricata</i>	Imbricate cactus	Succulent	Declared Category 1b

## 7.3. Birds

Birds are regarded as one of the most useful bioindicators, and they have been used extensively as models to determine ecosystem function (see review Koskimies 1989; Potts et al. 2014; Bregman et al. 2016). Birds observed during the survey were mainly generalists that are not sensitive to habitat transformation (Table 5).

Table 5: List of bird species observed at the study area

Species	Common Name	IUCN Conservation Status
<i>Bostrychia hagedash</i>	Hadedda Ibis	LC
<i>Corvus albus</i>	Pied Crow	LC
<i>Elanus caeruleus</i>	Black-shouldered Kite	LC
<i>Lagonosticta rubricata</i>	African Firefinch	LC
<i>Saxicola torquatus</i>	African Stonechat	LC
<i>Sigelus silens</i>	Fiscal Flycatcher	LC
<i>Uraeginthus angolensis</i>	Blue Waxbill	LC
<i>Vanellus armatus</i>	Blacksmith Lapwing	LC
<i>Cisticola fulvicapilla</i>	Neddicky	LC
<i>Lanius collaris</i>	Common Fiscal	LC
<i>Spilopelia senegalensis</i>	Laughing Dove	LC
<i>Ploceus velatus</i>	Southern Masked Weaver	LC



<i>Vanellus coronatus</i>	Crowned Lapwing	LC
<i>Streptopelia capicola</i>	Cape Turtle Dove	LC

## 8. THE MAIN IMPACTS

- Loss of micro habitat
- Loss of foraging grounds

### Impact Assessment methodology

To assess the significance of the identified impacts, the following characteristics of each potential impact will be identified:

- The severity (the disturbance of the impact).
- The extent (the spatial extent of the impact).
- The duration (the length of period).
- The probability (the likelihood of the impact occurring); and
- The significance (a synthesis of the above).

The impact rating process is designed to provide a numerical rating of the various environmental impacts identified for various project activities. The significance rating process follows the established impact/risk assessment formula:

Significance = Consequence x Probability

Where Consequence = Severity + Extent + Duration

And Probability = Likelihood of an impact occurring

The matrix first calculates the rating out of 75 and then converts this into a percentage out of 100. The percentage is the figure quoted in the matrix. The weight assigned to the various parameters for positive and negative impacts in the formula is presented in Table 6 below.

Table 6: Impact Assessment Parameters.

Rating	Severity	Extent	Duration	Probability
5	Very significant impact/destruction of a highly valued species, habitat or ecosystem or extremely positive impact over baseline environmental condition.	National/ International	Permanent/ Irreversible  (More than 50 years)	Certain/ Normally happens in cases of this nature (80-100% chance of happening)

4	Serious impairment of ecosystem function or very positive impact over baseline environmental condition.	Provincial/ Regional	Long Term (25 to 49 years or Beyond closure)	Will more than likely Happen (60-79% chance)
3	Moderate negative alteration of ecosystem functioning or moderately positive impact over baseline environmental condition.	Regional (substantially beyond site boundary)	Medium Term (5-24 years)	Could happen and has happened here or elsewhere (40-59% chance)
2	Minor effects not affecting ecosystem functioning or slightly positive impact over baseline environmental condition.	Local (beyond site boundary and affects neighbours)	Medium- Short Term (1-4 years)	Has not happened yet, but could happen (20-39% chance)
1	Insignificant effects on the biophysical environment or insignificantly positive impact over baseline environmental condition.	Site (does not extend beyond site boundary)	Short term (Less than a year)	Conceivable, but only in a set of very specific and extreme circumstances (0-19% chance)

Impacts are rated prior to mitigation and again after consideration of the mitigation measure proposed for the Environmental Management Programme (EMPr). The significance of an impact is then determined and categorised into one of four categories, as indicated in Table 7.

Table 7: Significance threshold limits.

<b>Category</b>	<b>Description</b>	<b>Colour</b>
<i>High</i>	76%-100%	
<i>Medium – High</i>	51% - 75%	
<i>Low-Medium</i>	26% - 50%	
<i>Low</i>	0% - 25%	

## 8.1. IMPACT SIGNIFICANCE

Table 8: Vegetation

Parameter	Description (Pre-mitigation)	Rating (Pre-mitigation)	Description (Post-mitigation)	Rating (Post-mitigation)
Duration	<i>Permanent</i>	6	<i>Permanent</i>	5
Extent	<i>Site</i>	1	<i>Site</i>	1
Severity	<i>Medium</i>	2	<i>Medium</i>	2
Probability	<i>Definite</i>	3	<i>Definite</i>	2
Significance	<i>Medium</i>	70%	<i>Medium</i>	40%

Table 9: Birds

Parameter	Description (Pre-Mitigation)	Rating (Pre-Mitigation)	Description (Post-mitigation)	Rating (Post mitigation)
Duration	<i>Medium term</i>	3	<i>Short term</i>	2
Extent	<i>Site</i>	1	<i>Site</i>	1
Severity	<i>Medium</i>	2	<i>Low</i>	1
Probability	<i>Probable</i>	2	<i>Probable</i>	2
Significance	<i>Medium</i>	55%	<i>Low - Medium</i>	35%

Table 10: Mammals

Parameter	Description (pre-Mitigation)	Rating (Pre-Mitigation)	Description (post-mitigation)	Rating (post mitigation)
Duration	<i>Long term</i>	4	<i>Medium term</i>	3
Extent	<i>Site</i>	1	<i>Site</i>	1
Severity	<i>Medium</i>	2	<i>Low</i>	1
Probability	<i>Possible</i>	1	<i>Possible</i>	1
Significance	<i>Medium</i>	55%	<i>Low - Medium</i>	30%

Table 11: Reptiles and Amphibians

<i>Parameter</i>	<i>Description (pre-Mitigation)</i>	<i>Rating (Pre-Mitigation)</i>	<i>Description (post-mitigation)</i>	<i>Rating (post mitigation)</i>
<i>Duration</i>	<i>Medium term</i>	<i>3</i>	<i>Short term</i>	<i>2</i>
<i>Extent</i>	<i>Site</i>	<i>1</i>	<i>Site</i>	<i>1</i>
<i>Severity</i>	<i>Medium</i>	<i>2</i>	<i>Low</i>	<i>1</i>
<i>Probability</i>	<i>Probable</i>	<i>1</i>	<i>Probable</i>	<i>1</i>
<i>Significance</i>	<i>Medium</i>	<i>50%</i>	<i>Low-Medium</i>	<i>40%</i>

## 9. RECOMMENDATIONS AND CONCLUSIONS

Although there are some disturbed habitats within the proposed site, there are also areas that still have intact grassland vegetation and it warrants conservation. As a result, the ecological integrity of the site is in fair-good condition, and it can still maintain the ecological processes.

The following are recommended:

- Watercourses and their buffers should be treated as a no go area.
- All temporary stockpile areas including litter and dumped material and rubble must be removed on completion of site establishment.
- No wastewater from the site is to flow into the nearby watercourses.
- Any erosion problems observed on the site must be attended to.
- No painting or marking of vegetation shall be allowed. Marking shall be done by steel stakes with tags, if required.
- Avoid translocating topsoil stockpiles from one place to another or importing topsoil from other sources that may contain alien plant propagules.
- All construction plant and vehicles should be maintained and be in good condition.
- Only necessary damage must be caused: for example, unnecessary driving around in the site should not take place.
- An open space management plan must be developed for the area, which will manage the habitats within the site.

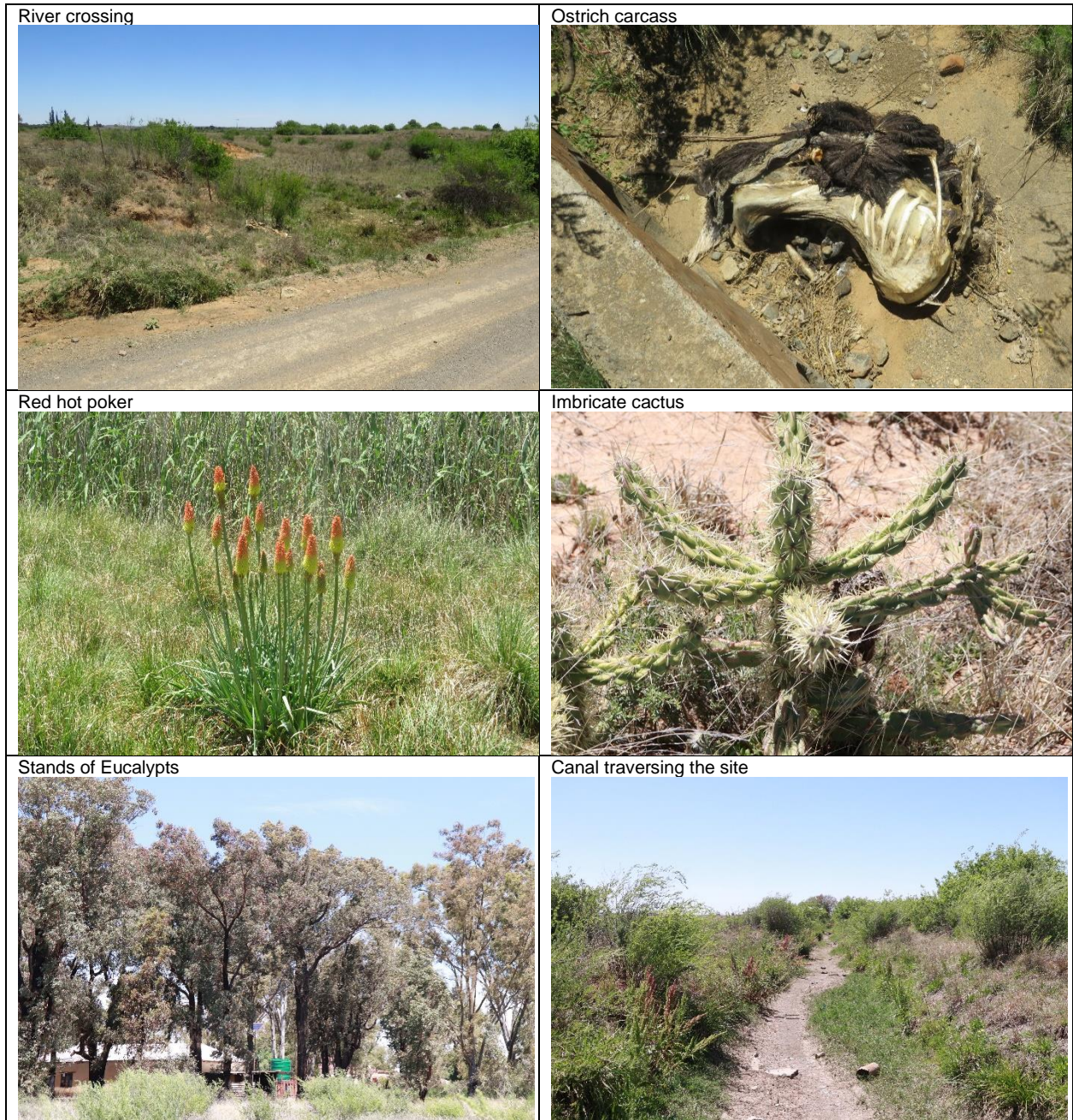
The impacts associated with the proposed cemetery are likely to be Medium-Low after implementation of mitigation measures.

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# 11. APPENDIX

## Appendix A: Site photos



## Appendix B: Sabap 2 species list

No	Common group	Common species	Genus	Species	Latest Adhoc
1		Bokmakierie	<i>Telophorus</i>	<i>zeylonus</i>	2017-02-11
2		Mallard	<i>Anas</i>	<i>platyrhynchos</i>	-
3		Neddicky	<i>Cisticola</i>	<i>fulvicapilla</i>	2017-02-11
4		Quailfinch	<i>Ortygospiza</i>	<i>atricollis</i>	2021-05-31
5		Ruff	<i>Calidris</i>	<i>pugnax</i>	-
6		Secretarybird	<i>Sagittarius</i>	<i>serpentarius</i>	2017-01-08
7	Barbet	Acacia Pied	<i>Tricholaema</i>	<i>leucomelas</i>	2017-02-11
8	Barbet	Crested	<i>Trachyphonus</i>	<i>vaillantii</i>	-
9	Bee-eater	European	<i>Merops</i>	<i>apiaster</i>	2017-12-20
10	Bishop	Southern Red	<i>Euplectes</i>	<i>orix</i>	2020-12-12
11	Bishop	Yellow-crowned	<i>Euplectes</i>	<i>afer</i>	2020-09-13
12	Bulbul	African Red-eyed	<i>Pycnonotus</i>	<i>nigricans</i>	2020-07-03
13	Bunting	Cinnamon-breasted	<i>Emberiza</i>	<i>tahapisi</i>	-
14	Bustard	Ludwig's	<i>Neotis</i>	<i>ludwigii</i>	-
15	Buzzard	Common	<i>Buteo</i>	<i>buteo</i>	2018-01-10
16	Buzzard	Jackal	<i>Buteo</i>	<i>rufufuscus</i>	2020-10-18
17	Canary	Black-throated	<i>Crithagra</i>	<i>atrogularis</i>	2021-05-31
18	Canary	Yellow	<i>Crithagra</i>	<i>flaviventris</i>	2017-12-20
19	Chat	Ant-eating	<i>Myrmecocichla</i>	<i>formicivora</i>	2020-11-28
20	Chat	Familiar	<i>Oenanthe</i>	<i>familiaris</i>	-
21	Chat	Sickle-winged	<i>Emarginata</i>	<i>sinuata</i>	-
22	Cisticola	Cloud	<i>Cisticola</i>	<i>textrix</i>	-
23	Cisticola	Desert	<i>Cisticola</i>	<i>aridulus</i>	2020-07-03
24	Cisticola	Grey-backed	<i>Cisticola</i>	<i>subruficapilla</i>	-
25	Cisticola	Levaillant's	<i>Cisticola</i>	<i>tinniens</i>	-
26	Cisticola	Zitting	<i>Cisticola</i>	<i>juncidis</i>	-
27	Coot	Red-knobbed	<i>Fulica</i>	<i>cristata</i>	-
28	Cormorant	Reed	<i>Microcarbo</i>	<i>africanus</i>	-
29	Cormorant	White-breasted	<i>Phalacrocorax</i>	<i>lucidus</i>	-
30	Courser	Double-banded	<i>Rhinoptilus</i>	<i>africanus</i>	-
31	Crow	Pied	<i>Corvus</i>	<i>albus</i>	2021-04-27
32	Cuckoo	Diederik	<i>Chrysococcyx</i>	<i>caprius</i>	2017-02-11
33	Darter	African	<i>Anhinga</i>	<i>rufa</i>	-
34	Dove	Cape Turtle	<i>Streptopelia</i>	<i>capicola</i>	-
35	Dove	Laughing	<i>Spilopelia</i>	<i>senegalensis</i>	2018-08-13
36	Dove	Namaqua	<i>Oena</i>	<i>capensis</i>	2021-05-31
37	Dove	Red-eyed	<i>Streptopelia</i>	<i>semitorquata</i>	2017-02-11
38	Dove	Rock	<i>Columba</i>	<i>livia</i>	2020-11-28
39	Duck	White-faced Whistling	<i>Dendrocygna</i>	<i>viduata</i>	-

No	Common group	Common species	Genus	Species	Latest Adhoc
40	Duck	Yellow-billed	<i>Anas</i>	<i>undulata</i>	-
41	Eagle	African Fish	<i>Haliaeetus</i>	<i>vocifer</i>	-
42	Eagle	Black-chested Snake	<i>Circaetus</i>	<i>pectoralis</i>	2019-07-15
43	Egret	Great	<i>Ardea</i>	<i>alba</i>	-
44	Egret	Little	<i>Egretta</i>	<i>garzetta</i>	-
45	Egret	Western Cattle	<i>Bubulcus</i>	<i>ibis</i>	2021-10-03
46	Eremomela	Yellow-bellied	<i>Eremomela</i>	<i>icteropygialis</i>	-
47	Falcon	Amur	<i>Falco</i>	<i>amurensis</i>	-
48	Finch	Red-headed	<i>Amadina</i>	<i>erythrocephala</i>	-
49	Fiscal	Southern	<i>Lanius</i>	<i>collaris</i>	2020-07-03
50	Flycatcher	Fiscal	<i>Melaenornis</i>	<i>silens</i>	2020-07-03
51	Francolin	Orange River	<i>Scleroptila</i>	<i>gutturalis</i>	-
52	Goose	Egyptian	<i>Alopochen</i>	<i>aegyptiaca</i>	-
53	Goose	Spur-winged	<i>Plectropterus</i>	<i>gambensis</i>	2017-02-11
54	Goshawk	Pale Chanting	<i>Melierax</i>	<i>canorus</i>	2017-12-20
55	Grebe	Great Crested	<i>Podiceps</i>	<i>cristatus</i>	2017-11-10
56	Grebe	Little	<i>Tachybaptus</i>	<i>ruficollis</i>	-
57	Guineafowl	Helmeted	<i>Numida</i>	<i>meleagris</i>	2020-11-28
58	Gull	Grey-headed	<i>Chroicocephalus</i>	<i>cirrocephalus</i>	-
59	Harrier	Black	<i>Circus</i>	<i>maurus</i>	2019-08-07
60	Harrier-Hawk	African	<i>Polyboroides</i>	<i>typus</i>	2017-04-22
61	Heron	Black-crowned Night	<i>Nycticorax</i>	<i>nycticorax</i>	-
62	Heron	Black-headed	<i>Ardea</i>	<i>melanocephala</i>	2021-10-03
63	Heron	Goliath	<i>Ardea</i>	<i>goliath</i>	-
64	Heron	Grey	<i>Ardea</i>	<i>cinerea</i>	-
65	Heron	Squacco	<i>Ardeola</i>	<i>ralloides</i>	-
66	Honeyguide	Lesser	<i>Indicator</i>	<i>minor</i>	-
67	Hoopoe	African	<i>Upupa</i>	<i>africana</i>	2017-12-20
68	Ibis	African Sacred	<i>Threskiornis</i>	<i>aethiopicus</i>	2020-07-03
69	Ibis	Hadada	<i>Bostrychia</i>	<i>hagedash</i>	2021-10-03
70	Kestrel	Lesser	<i>Falco</i>	<i>naumanni</i>	-
71	Kingfisher	Malachite	<i>Corythornis</i>	<i>cristatus</i>	-
72	Kite	Black-winged	<i>Elanus</i>	<i>caeruleus</i>	2020-12-04
73	Korhaan	Blue	<i>Eupodotis</i>	<i>caerulescens</i>	2018-08-13
74	Korhaan	Northern Black	<i>Afrotis</i>	<i>afraoides</i>	2017-02-11
75	Lapwing	Blacksmith	<i>Vanellus</i>	<i>armatus</i>	-
76	Lapwing	Crowned	<i>Vanellus</i>	<i>coronatus</i>	-
77	Lark	Eastern Clapper	<i>Mirafra</i>	<i>fasciolata</i>	2017-02-11
78	Lark	Melodious	<i>Mirafra</i>	<i>cheniana</i>	2017-02-11
79	Lark	Pink-billed	<i>Spizocorys</i>	<i>conirostris</i>	-



No	Common group	Common species	Genus	Species	Latest Adhoc
80	Lark	Red-capped	<i>Calandrella</i>	<i>cinerea</i>	-
81	Lark	Spike-heeled	<i>Chersomanes</i>	<i>albofasciata</i>	-
82	Longclaw	Cape	<i>Macronyx</i>	<i>capensis</i>	2017-02-11
83	Martin	Brown-throated	<i>Riparia</i>	<i>paludicola</i>	-
84	Martin	Rock	<i>Ptyonoprogne</i>	<i>fuligula</i>	-
85	Moorhen	Common	<i>Gallinula</i>	<i>chloropus</i>	-
86	Mousebird	Red-faced	<i>Urocolius</i>	<i>indicus</i>	-
87	Mousebird	White-backed	<i>Colius</i>	<i>colius</i>	-
88	Myna	Common	<i>Acridotheres</i>	<i>tristis</i>	-
89	Ostrich	Common	<i>Struthio</i>	<i>camelus</i>	-
90	Peafowl	Indian	<i>Pavo</i>	<i>cristatus</i>	-
91	Pigeon	Speckled	<i>Columba</i>	<i>guinea</i>	2020-11-28
92	Pipit	African	<i>Anthus</i>	<i>cinnamomeus</i>	-
93	Pipit	Nicholson's	<i>Anthus</i>	<i>nicholsoni</i>	-
94	Pipit	Plain-backed	<i>Anthus</i>	<i>leucophrys</i>	2020-07-03
95	Plover	Kittlitz's	<i>Charadrius</i>	<i>pecuarius</i>	-
96	Plover	Three-banded	<i>Charadrius</i>	<i>tricoloris</i>	2016-12-07
97	Prinia	Black-chested	<i>Prinia</i>	<i>flavicans</i>	-
98	Quail	Common	<i>Coturnix</i>	<i>coturnix</i>	-
99	Quelea	Red-billed	<i>Quelea</i>	<i>quelea</i>	-
100	Robin-Chat	Cape	<i>Cossypha</i>	<i>caffra</i>	-
101	Sandpiper	Common	<i>Actitis</i>	<i>hypoleucos</i>	-
102	Scrub Robin	Karoo	<i>Cercotrichas</i>	<i>coryphoeus</i>	-
103	Shelduck	South African	<i>Tadorna</i>	<i>cana</i>	-
104	Shoveler	Cape	<i>Spatula</i>	<i>smithii</i>	-
105	Sparrow	Cape	<i>Passer</i>	<i>melanurus</i>	2017-12-20
106	Sparrow	House	<i>Passer</i>	<i>domesticus</i>	2020-11-28
107	Sparrow	Southern Grey-headed	<i>Passer</i>	<i>diffusus</i>	-
108	Sparrow-Lark	Chestnut-backed	<i>Eremopterix</i>	<i>leucotis</i>	-
109	Sparrow-Weaver	White-browed	<i>Plocepasser</i>	<i>mahali</i>	2020-07-03
110	Sparrowhawk	Black	<i>Accipiter</i>	<i>melanoleucus</i>	2018-07-09
111	Spoonbill	African	<i>Platalea</i>	<i>alba</i>	-
112	Spurfowl	Swainson's	<i>Pternistis</i>	<i>swainsonii</i>	-
113	Starling	Cape	<i>Lamprotornis</i>	<i>nitens</i>	2017-12-20
114	Starling	Common	<i>Sturnus</i>	<i>vulgaris</i>	-
115	Starling	Pied	<i>Lamprotornis</i>	<i>bicolor</i>	2017-12-20
116	Starling	Wattled	<i>Creatophora</i>	<i>cinerea</i>	2017-04-16
117	Stilt	Black-winged	<i>Himantopus</i>	<i>himantopus</i>	-
118	Stonechat	African	<i>Saxicola</i>	<i>torquatus</i>	2020-07-03
119	Swallow	Barn	<i>Hirundo</i>	<i>rustica</i>	2017-02-11

No	Common group	Common species	Genus	Species	Latest Adhoc
120	Swallow	Greater Striped	<i>Cecropis</i>	<i>cucullata</i>	2019-10-15
121	Swallow	Red-breasted	<i>Cecropis</i>	<i>semirufa</i>	-
122	Swallow	South African Cliff	<i>Petrochelidon</i>	<i>spilodera</i>	2020-12-12
123	Swallow	White-throated	<i>Hirundo</i>	<i>albigularis</i>	-
124	Swift	Little	<i>Apus</i>	<i>affinis</i>	2020-12-04
125	Swift	White-rumped	<i>Apus</i>	<i>caffer</i>	2017-12-08
126	Teal	Cape	<i>Anas</i>	<i>capensis</i>	-
127	Tern	Whiskered	<i>Chlidonias</i>	<i>hybrida</i>	-
128	Tern	White-winged	<i>Chlidonias</i>	<i>leucopterus</i>	-
129	Thrush	Karoo	<i>Turdus</i>	<i>smithi</i>	-
130	Tit	Cape Penduline	<i>Anthoscopus</i>	<i>minutus</i>	-
131	Wagtail	Cape	<i>Motacilla</i>	<i>capensis</i>	-
132	Warbler	African Reed	<i>Acrocephalus</i>	<i>baeticatus</i>	-
133	Warbler	Rufous-eared	<i>Malcorus</i>	<i>pectoralis</i>	-
134	Waxbill	Common	<i>Estrilda</i>	<i>astrild</i>	-
135	Weaver	Southern Masked	<i>Ploceus</i>	<i>velatus</i>	2017-02-11
136	Wheatear	Mountain	<i>Myrmecocichla</i>	<i>monticola</i>	2020-11-28
137	White-eye	Orange River	<i>Zosterops</i>	<i>pallidus</i>	-
138	Whydah	Pin-tailed	<i>Vidua</i>	<i>macroura</i>	2016-11-29
139	Widowbird	Long-tailed	<i>Euplectes</i>	<i>progne</i>	-
140	Wryneck	Red-throated	<i>Jynx</i>	<i>ruficollis</i>	2017-02-11

Appendix C: Mammal list (based on known historical distribution data). Animal Demographic Unit.

No	Family	Scientific name	Common name	Red list category	Number of records	Last recorded
1	Bathyergidae	<i>Cryptomys hottentotus</i>	Southern African Mole-rat	Least Concern (2016)	2	2006-11-08
2	Bovidae	<i>Antidorcas marsupialis</i>	Springbok	Least Concern (2016)	1	2009-02-08
3	Bovidae	<i>Connochaetes gnou</i>	Black Wildebeest	Least Concern (2016)	2	2009-02-08
4	Bovidae	<i>Hippotragus niger</i>	Sable Antelope	Least Concern (ver 3.1, 2017)	1	2006-11-08
5	Bovidae	<i>Redunca fulvorufula</i>	Mountain Reedbuck	Least Concern	1	2009-02-08
6	Canidae	<i>Otocyon megalotis</i>	Bat-eared Fox	Least Concern (2016)	1	2014-09-25
7	Felidae	<i>Caracal caracal</i>	Caracal	Least Concern (2016)	1	2009-02-07
8	Felidae	<i>Felis silvestris</i>	Wildcat	Least Concern (2016)	1	2021-11-14
9	Herpestidae	<i>Cynictis penicillata</i>	Yellow Mongoose	Least Concern (2016)	3	2006-11-08
10	Hyaenidae	<i>Proteles cristata</i>	Aardwolf	Least Concern (2016)	1	1972-08-07
11	Hystricidae	<i>Hystrix africaeaustralis</i>	Cape Porcupine	Least Concern	1	1975-04-30
12	Mustelidae	<i>Poecilogale albinucha</i>	African Striped Weasel	Near Threatened (2016)	1	1985-10-07
13	Nesomyidae	<i>Malacothrix typica</i>	Large-eared African Desert Mouse	Least Concern (2016)	1	1974-07-25
14	Procaviidae	<i>Procavia capensis</i>	Cape Rock Hyrax	Least Concern (2016)	1	2021-08-01
15	Sciuridae	<i>Xerus inauris</i>	South African Ground Squirrel	Least Concern	2	2020-01-09

Appendix D: Frog list (based on known historical distribution data). Animal Demographic Unit.

No	Family	Scientific name	Common name	Red list category	Number of records	Last recorded
1	Bufo	<i>Poyntonophrynus vertebralis</i>	Southern Pygmy Toad	Least Concern	1	1974-01-15
2	Bufo	<i>Sclerophrys capensis</i>	Raucous Toad	Least Concern	2	1974-01-17
3	Hyperoliidae	<i>Kassina senegalensis</i>	Bubbling Kassina	Least Concern	2	1997-01-06
4	Pipidae	<i>Xenopus laevis</i>	Common Platanna	Least Concern	2	1997-01-06
5	Pyxicephalidae	<i>Amietia delalandii</i>	Delalande's River Frog	Least Concern (2017)	1	1974-01-17
6	Pyxicephalidae	<i>Amietia fuscigula</i>	Cape River Frog	Least Concern (2017)	2	1997-01-06
7	Pyxicephalidae	<i>Cacosternum boettgeri</i>	Common Caco	Least Concern (2013)	1	1974-01-17
8	Pyxicephalidae	<i>Pyxicephalus adspersus</i>	Giant Bull Frog	Near Threatened	2	2017-12-20
9	Pyxicephalidae	<i>Tomopterna sp.</i>			1	2011-04-15
10	Pyxicephalidae	<i>Tomopterna cryptotis</i>	Tremelo Sand Frog	Least Concern	1	1974-01-17

Appendix E: Reptile list (based on known historical distribution data). Animal Demographic Unit.

No	Family	Scientific name	Common name	Red list category	Number of records	Last recorded
1	Agamidae	<i>Agama aculeata distanti</i>	Distant's Ground Agama	Least Concern (SARCA 2014)	2	2017-12-20
2	Agamidae	<i>Agama atra</i>	Southern Rock Agama	Least Concern (SARCA 2014)	4	1973-03-03
3	Cordylidae	<i>Karusasaurus polyzonus</i>	Karoo Girdled Lizard	Least Concern (SARCA 2014)	8	1973-03-30
4	Elapidae	<i>Naja nivea</i>	Cape Cobra	Least Concern (SARCA 2014)	3	1974-10-09
5	Gekkonidae	<i>Pachydactylus capensis</i>	Cape Gecko	Least Concern (SARCA 2014)	3	1973-03-30
6	Gerrhosauridae	<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated Lizard	Least Concern (SARCA 2014)	1	1900-06-15
7	Lacertidae	<i>Nucras holubi</i>	Holub's Sandveld Lizard	Least Concern (SARCA 2014)	2	1974-01-17
8	Lacertidae	<i>Pedioplanis lineocellata lineocellata</i>	Spotted Sand Lizard	Least Concern (SARCA 2014)	1	1973-03-30
9	Lamprophiidae	<i>Aparallactus capensis</i>	Black-headed Centipede-eater	Least Concern (SARCA 2014)	1	1980-02-06
10	Lamprophiidae	<i>Boaedon capensis</i>	Brown House Snake	Least Concern (SARCA 2014)	2	1973-03-30
11	Lamprophiidae	<i>Psammophis trinasalis</i>	Fork-marked Sand Snake	Least Concern (SARCA 2014)	2	1973-03-30
12	Lamprophiidae	<i>Psammophylax tritaeniatus</i>	Striped Grass Snake	Least Concern (SARCA 2014)	7	1990-11-29
13	Lamprophiidae	<i>Pseudaspis cana</i>	Mole Snake	Least Concern (SARCA 2014)	3	2017-01-02
14	Pelomedusidae	<i>Pelomedusa galeata</i>	South African Marsh Terrapin	Not evaluated	2	1976-06-15
15	Scincidae	<i>Trachylepis capensis</i>	Cape Skink	Least Concern (SARCA 2014)	1	1973-03-30
16	Scincidae	<i>Trachylepis punctatissima</i>	Speckled Rock Skink	Least Concern (SARCA 2014)	2	1973-03-30
17	Scincidae	<i>Trachylepis punctulata</i>	Speckled Sand Skink	Least Concern (SARCA 2014)	3	1973-03-30
18	Testudinidae	<i>Homopus femoralis</i>	Greater Padloper	Least Concern (SARCA 2014)	2	1973-03-30
19	Testudinidae	<i>Stigmochelys pardalis</i>	Leopard Tortoise	Least Concern (SARCA 2014)	3	2010-09-04

