

**Specialist Report: Ecological Assessment Of  
The Development Footprint For The  
Montrose Intersection On The  
N4 Highway, Mpumalanga Province**

Commissioned by

**Prism Environmental Management Services**

Compiled by

**Ekoinfo CC & Associates**

October 2019

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Report Status	Version	File Route
Final	3	C:\02_Projects\01_Ekoinfo\20190930Eko_EcologySchoemanskloof_PrismRyan\Reports\tx\Ekoinfo CC Ecological Assessment N4 Montrose Prism Updatedv2.docx

## 1 EXECUTIVE SUMMARY

Prism Environmental Management Services appointed Ekoinfo CC to do a ecological assessment of the remaining natural areas within the proposed interchange upgrade footprint along a section of the N4 near Mbombela in Mpumalanga Province. Willem de Frey, a registered scientific professional in the fields of ecological – and botanical science with more than 20 years' experience facilitated the study.

The study consisted of a literature – and desktop review to provide regional context, while a site visit was done on the 8<sup>th</sup> of October 2019 to provide local context. During the site visit four Braun-Blanquet plots were surveyed, and remote images captured of the area.

It was determined that the site is located with Legogote Sour Bushveld within the Savanna Biome of South Africa, an endangered regional vegetation unit. The remaining natural vegetation contain national and provincial protected plants, for which permits are required for their destruction.

Due to the presence of existing road infrastructure and small footprint of the proposed interchange upgrade (4 ha), it is not expected that the development will have a significant impact on fauna in the area. However, the upgrade does provide an opportunity to improve the permeability of the road infrastructure to allow the movement of small to medium animals and herpetofauna to and from the Crocodile River, a source of water in the area.

Due to the fact that the proposed upgrade will contribute less than 1% to transformation of the remaining natural vegetation and therefore habitat in quaternary catchment X21E, this development cannot be considered a no-go.

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## 2 INTRODUCTION

Prism Environmental Management Services appointed EkolInfo CC to facilitate an ecological assessment of the proposed upgrade of the Montrose interchange along the N4 Highway in Mpumalanga Province (Figure 1).

### 2.1 Scope of work/ Terms of reference

EkolInfo CC was appointed to do an ecological assessment of the area to be impacted upon by the proposed upgraded of the Montrose interchange along the N4 in Mpumalanga Province. The appointment did not specify any criteria, and therefore the criteria/ guidelines provided in Appendix 6 of the NEMA EIA Regulations of 2014 was implemented. The principals in general requires the following:

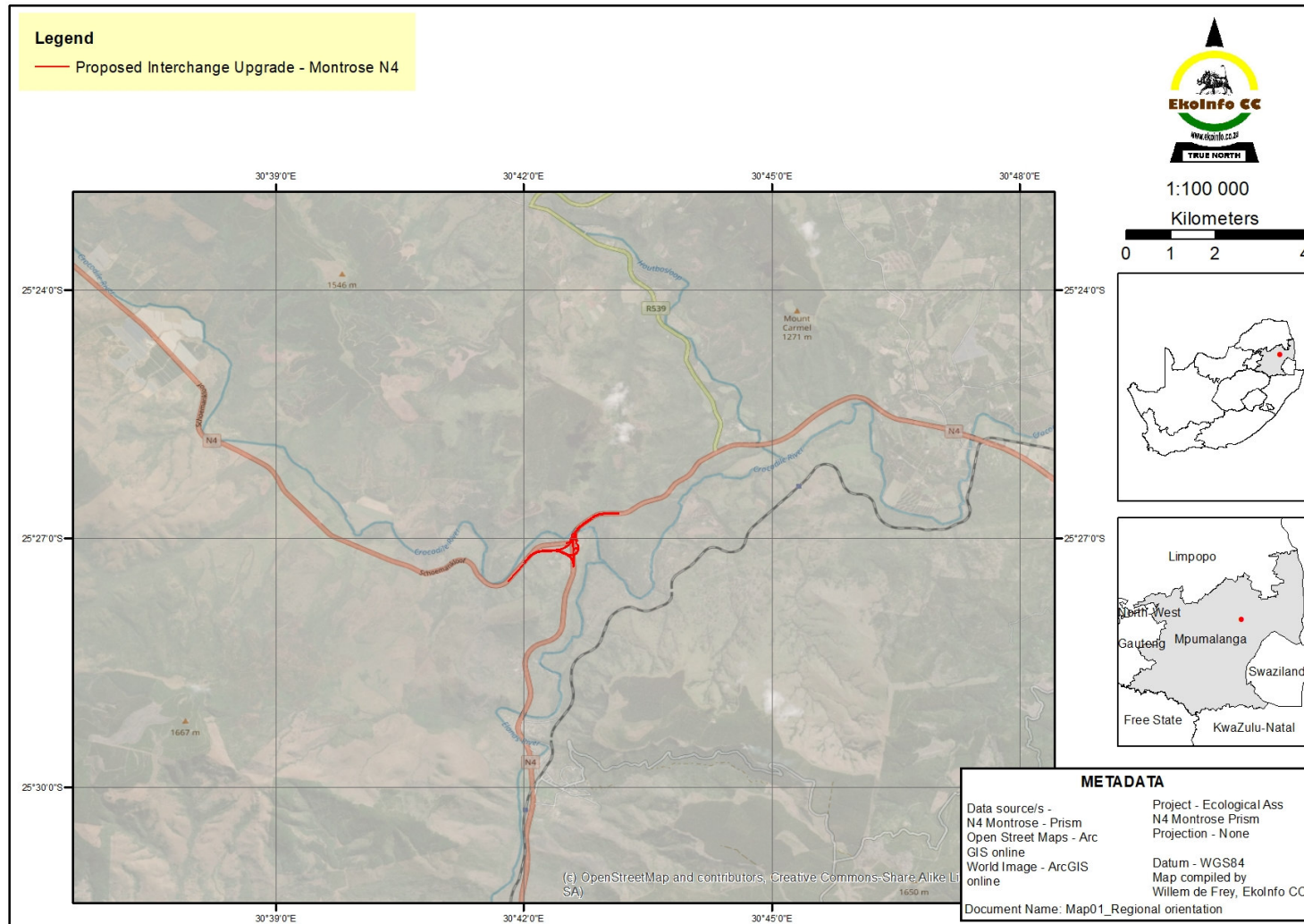
1. Details of the specialist and CV (Appendix A).
2. Declaration of independence – page 2
3. Indication of the scope and purpose of the document
4. Date and season of the site visit
5. Method statement
6. Sensitive areas to be identified
7. Areas to be avoided to be identified
8. Map indicating the location of the site, its sensitivities and associated buffers
9. Limitations and assumptions
10. Impact assessment and mitigation measures
11. Conditions to be included in the environmental authorisation
12. Monitoring requirements to include in the EMPr
13. A reasoned opinion
14. Any consultation that had taken place or related correspondence
15. Additional information required by the competent authority

Willem de Frey, sole member and principal consultant of EkolInfo CC facilitated the ecological assessment, he is a registered scientific professional in the fields of ecological – and botanical science with more than 20 years' experience.

## 3 STUDY AREA

The study area concerns the road infrastructure required to upgrade the existing road network in the area (Figure 2). From the remote images captured on the 8<sup>th</sup> of October 2019, it is evident, that proposed new road infrastructure will transect both natural areas and human influenced areas. The natural areas consist of open woodland (terrestrial) (Photo 1) and closed woodland/ forest (aquatic) (Photo 2), while the human influenced areas consist of factories (Photo 3), storage facilities (Photo 4) and quarries (Photo 5).

The approximate length of new roads which will impact on untransformed areas (not existing road) is 4.301 km. At a mean road width of 10 m, the additional land to be transformed to road infrastructure will be a minimum of 4 ha.



**Figure 1: Regional orientation of the proposed interchange upgrade N4 Montrose (Study Area)**

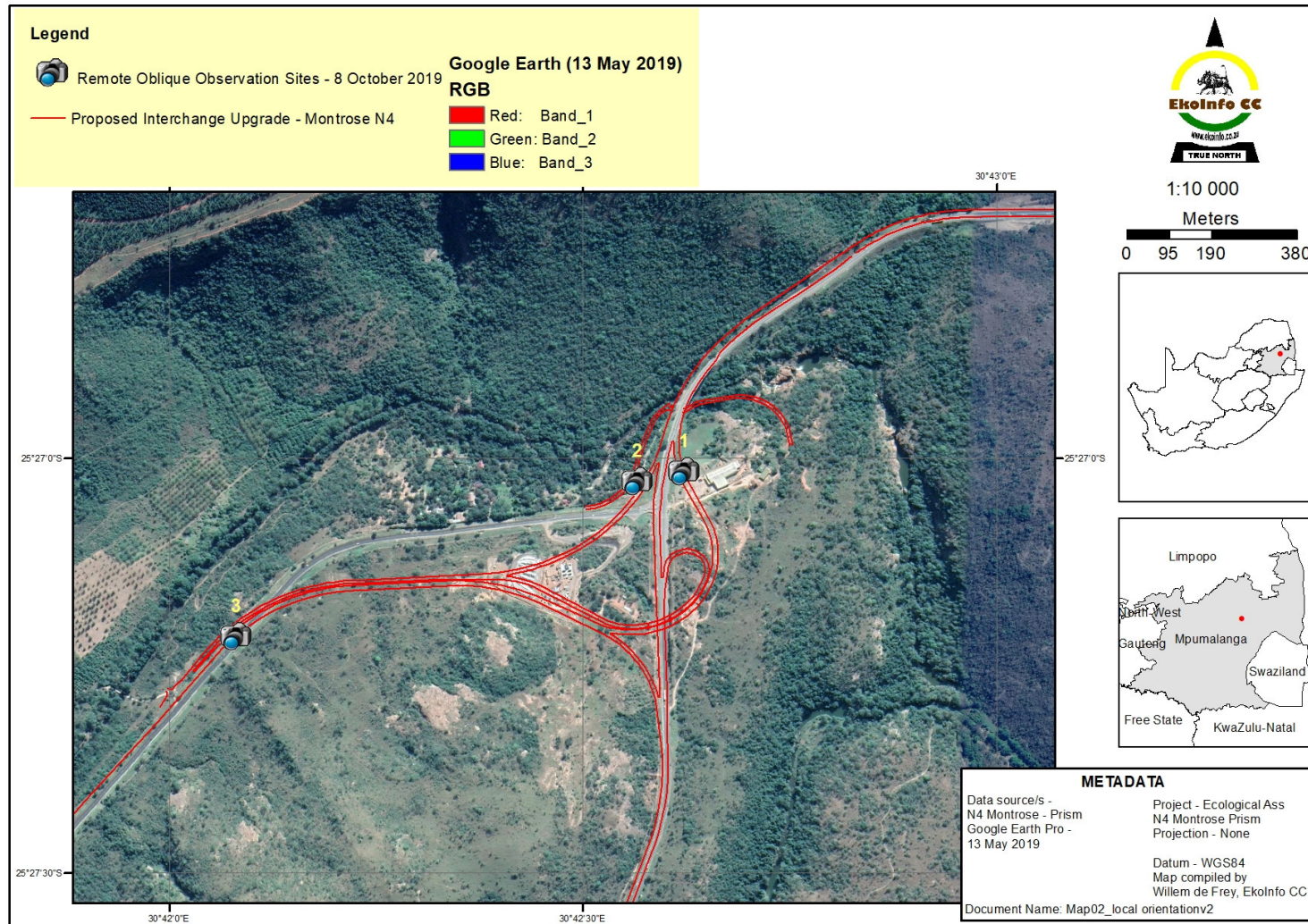


Figure 2: Local orientation of the study area, indicating the distribution and extent of existing road infrastructure and proposed infrastructure (Red lines)





**Photo 1: Example of the natural open woodland (terrestrial) present (Remote Oblique Observation Site 3, Direction Northeast)**



**Photo 2: Example of the natural closed woodland/ forest (aquatic) present (Remote Oblique Observation Site 2, Direction North)**



**Photo 3: Example of the human influenced areas - factory (Remote Oblique Observation Site 2, Direction Southwest)**



**Photo 4: Example of the human influenced areas – storage area (Remote Oblique Observation Site 2, Direction East)**



**Photo 5: Example of the human influenced areas – quarries (Remote Oblique Observation Site 1, Direction Southeast)**

## 4 METHOD STATEMENT

The assessment involved two components, a literature and desktop review, which provides regional context, and highlights potential issues of concern regarding the ecology in the area, and the actual fieldwork, which provides local context, and aims to verify the issues of concern identified during the literature and desktop review.

### 4.1 Literature – And Desktop Review

Available small-scale dataset available from government and academic institutions were reviewed. Most of the datasets are available on the Internet at the various institutions. A primary source of this information is SANBI's BGIS platform<sup>1</sup>

An additional small-scale data that was obtained was from international institutions such as USGS Earth Explorer<sup>2</sup>, which provide satellite imagery and Digital Elevation Models.

### 4.2 Fieldwork

Fieldwork was done on the 8<sup>th</sup> of October 2019 and involved the use of the Braun-Blanquet approach, which is the national standard for vegetation description and mapping in South Africa (Brown *et al* 2013).

The Braun-Blanquet approach involves the use of plots, where in the floristic composition, vegetation characteristics and environmental data is recorded (Kent & Coker 1992, De Frey 1999). The plot size varies according to the dominant vegetation, whether Savanna or Grassland, within the Savanna Biome the standard plot size is 10 x 20 m. Four plots were surveyed based on expected variation in soil conditions.

#### 4.2.1 Limitations And Assumptions

1. The assessment represents a sample not a census, therefore not all of the area was covered, only plots were surveyed, no walkdown of the proposed road servitude was done.
2. The main objective was to verify the presence or absence of species of concern, specifically plants for which permits are required to remove
3. The survey was done at the beginning of the growing season, thus not all of the plant was flowering or having seed.
4. The optimal time for vegetation surveys in the summer rainfall area of South Africa is January/ February to April/ May in the Savanna Biome.
5. For the purpose of this ecological assessment, only those areas not associated with existing road infrastructure had been considered.
6. It is assumed that information from third parties are accurate and/ or correct.

<sup>1</sup> <https://www.sanbi.org/link/bgis-biodiversity-gis/>

<sup>2</sup> <https://earthexplorer.usgs.gov>

## 5 RESULTS

### 5.1 Regional Context – Literature And Desktop Review

The extent of area not associated with existing road infrastructure, to be transformed by the upgrade of the interchange is approximately 4 ha (Figure 3). This regional vegetation unit is classified as being Endangered.

#### 5.1.1 Ecosystem Diversity

On a national scale, the study area is located within the Legogote Sour Bushveld within the Savanna Biome of South Africa (Figure 3). The vegetation unit is described as follows (Mucina & Rutherford 2006):

“Gently to moderately sloping upper pediment slopes with dense woodland including many medium to large shrubs often dominated by *Parinari curatellifolia* and *Bauhinia galpinii* with *Hyperthelia dissoluta* and *Panicum maximum* in the undergrowth. Short thicket dominated by *Acacia ataxacantha* occurs on less rocky sites. Exposed granite outcrops have low vegetation cover, typically with *Englerophytum magalismontanum*, *Aloe petricola* and *Myrothamnus flabellifolia*.

Conservation Endangered. Target 19%. About 2% statutorily conserved mainly in the Bosbokrand and Barberton Nature Reserves; at least a further 2% is conserved in private reserves including the Mbesan and Kaapsehoop Reserves and Mondi Cycad Reserve. It has been greatly transformed (50%), mainly by plantations and also by cultivated areas and urban development. Scattered alien plants include *Lantana camara*, *Psidium guajava* and *Solanum mauritianum*. Erosion is very low to moderate.”

#### 5.1.2 Species Diversity

Within the regional vegetation 68 plant species are listed, namely: *Acacia ataxacantha*, *Acacia caffra*, *Acacia davyi*, *Acacia sieberiana*, *Agathisanthemum bojeri*, *Aloe petricola*, *Aloe simii*, *Andropogon schirensis*, *Antidesma venosum*, *Bauhinia galpinii*, *Bothriochloa bladhii*, *Combretum zeyheri*, *Cymbopogon excavatus*, *Cymbopogon validus*, *Diospyros galpinii*, *Diospyros lycioides*, *Eriosema psoraleoides*, *Erythrina latissima*, *Erythroxyllum delagoense*, *Erythroxyllum emarginatum*, *Euphorbia ingens*, *Euphorbia vandermerwei*, *Faurea rochetiana*, *Faurea saligna*, *Ficus burkei*, *Ficus glumosa*, *Ficus ingens*, *Ficus petersii*, *Flemingia grahamiana*, *Gerbera ambigua*, *Gerbera viridifolia*, *Gladiolus hollandii*, *Gymnosporia heterophylla*, *Helinus integrifolius*, *Hemizygia persimilis*, *Hemizygia punctata*, *Heteropyxis natalensis*, *Hibiscus sidiformis*, *Huernia kirkii*, *Hyparrhenia cymbaria*, *Hyparrhenia poecilotracha*, *Hyperthelia dissoluta*, *Hypoxis rigidula*, *Indigofera filipes*, *Myrothamnus flabellifolius*, *Ocimum gratissimum*, *Olea europaea*, *Orbea carnosae*, *Pachystigma macrocalyx*, *Panicum maximum*, *Parinari curatellifolia*, *Paspalum scrobiculatum*, *Peltophorum africanum*, *Piliostigma thonningii*, *Pseudarthria hookeri*, *Pterocarpus angolensis*, *Pterocarpus rotundifolius*, *Rhus pentheri*, *Rhus rogersii*, *Schizachyrium sanguineum*, *Schotia brachypetala*, *Sclerocarya birrea*, *Sphedamnocarpus pruriens*, *Stapelia gigantea*, *Terminalia sericea*, *Trichilia emetica*, *Vernonia amygdalina*, *Waltheria indica*

Of the 68 species listed, one species is nationally protected and threatened in terms of the National Environmental Management Biodiversity Act, namely *Aloe simii* (Appendix B), this succulent is classified as Critically Endangered, and associated with wetland habitat.

Two nationally protected trees in terms of the National Forest Act (1998) occurs within the regional unit namely: *Pterocarpus angolensis* and *Sclerocarya birrea*.

The following species which are protected in terms of the Mpumalanga Nature Conservation Act (No 10 of 1998) occur in the regional vegetation unit, namely: *Pterocarpus angolensis*, all of the species within the following genera *Aloe*, *Gladiolus*, *Olea*, *Huernia*, *Stapelia* and *Orbea* and all of the species in the family Proteaceae (*Faurea rochetiana*, *Faurea saligna*).

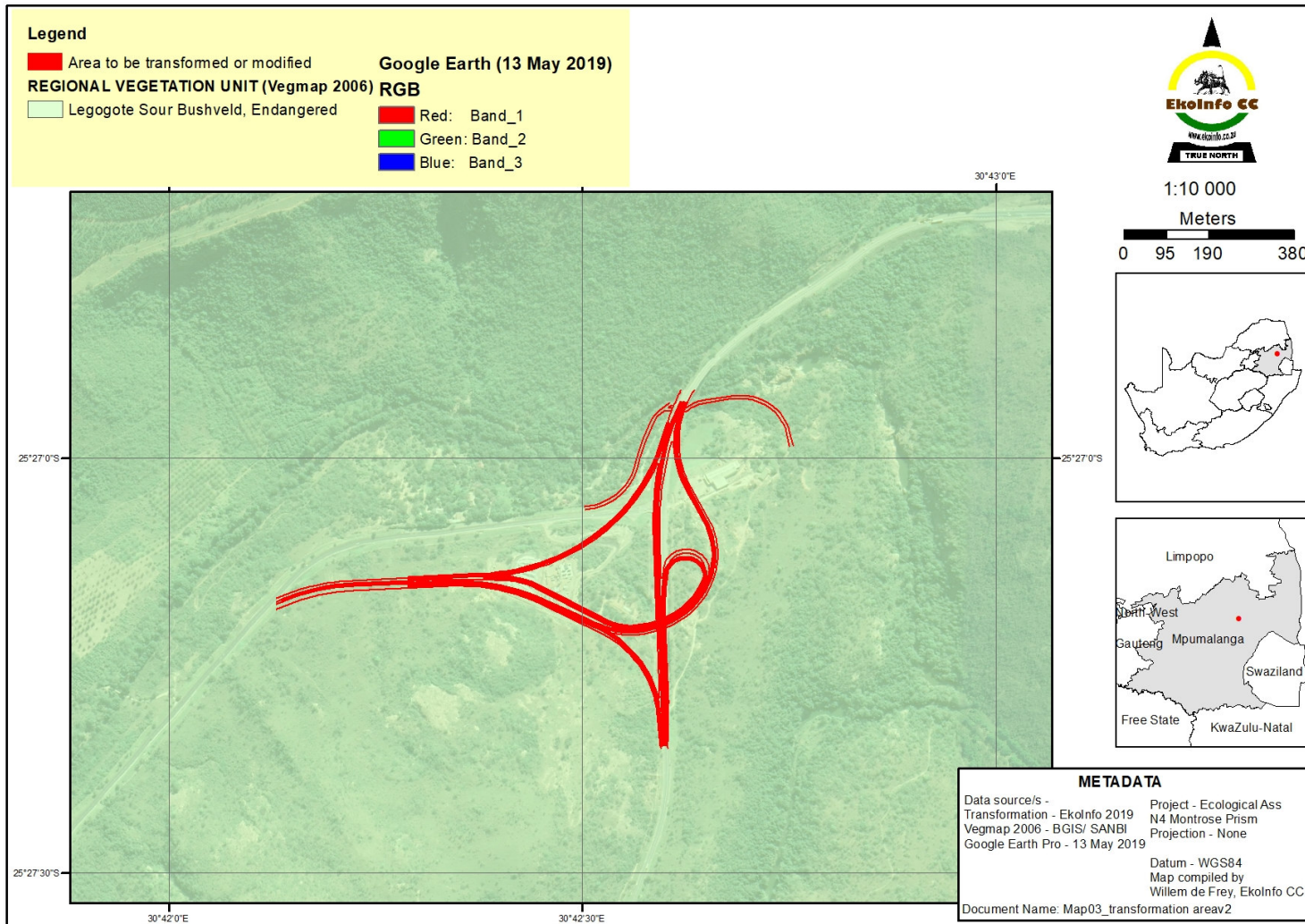


Figure 3: Overview of the transformation influence of the proposed interchange upgrade and the regional vegetation unit in which it occur

Permits are required for the removal or destruction of nationally protected plants, while permits are only required for provincially protected plant's destruction if developer is not the owner of the land or if the plants would be sold or moved into other areas of the provinces.

### 5.1.3 Areas Of Conservation Concern

The proposed interchange upgrade transects Critical Biodiversity Areas (CBA Irreplaceable) (Figure 4). Approximately 2.7263 ha or 69% of the proposed interchange upgrade footprint represents irreplaceable Critical Biodiversity Area (Table 1). An Environmental Impact Assessment is required if more than 300 m<sup>2</sup> of Critical Biodiversity Areas is to be transformed.

## 5.2 Local Context – Site Visit

The objective of the site visit done on the 8<sup>th</sup> of October 2019, was to verify the relevance of the regional information, as well as confirm the absence or presence of species of concern.

Four sites were placed across the area based on observed vegetation cover and expected variation in soil conditions (Figure 5). At each plot, the environmental attributes were recorded (Appendix C), as well as the flora species recorded (Appendix D). Georeferenced digital photographs were taken in the four major wind directions, as well as a profile of the soil (Appendix E).

### 5.2.1 Ecosystem Diversity

The floristic - and environmental data collected confirms the study area's association with the Legogote Sour Bushveld regional vegetation, due to the high frequency (50% >) of the following species in the four plots surveyed: *Acacia sieberiana*, *Annona senegalensis*, *Athrixia elata*, *Barleria obtusa*, *Cussonia natalensis*, *Dichrostachys cinerea*, *Dombeya rotundifolia*, *Elephantorrhiza elephantina*, *Faurea saligna*, *Helichrysum nudifolium*, *Hyparrhenia hirta*, *Lantana camara*, *Loudetia flavida*, *Peltophorum africanum*, *Psidium guajava*, *Pterocarpus angolensis*, *Pterocarpus rotundifolius*, *Rhus pyroides*, *Rhus transvaalensis*, *Sclerocarya birrea*, *Sebaea grandis*, *Senecio venosus*.

Based on the environmental data record (Appendix C) and those derived from the SRTM 1arc Digital Elevation Model (DEM) (Figure 6, Table 2), the area has the potential of two terrestrial communities, namely rocky areas with shallow soils (<= 300 mm) and finer textured soils (A horizon Clay: 10% >) towards the east (Plot 4 and 5), and areas with no surface rock, and deeper soils (> 300 mm with coarse textured soils (A horizon Clay: < = 10%) towards the west (Plot 2 and 3).

The Glenrosa soil form is typically found on highlying areas with igneous rock as the underlying geology (Appendix E), it represents young soils, while deeper, well-developed soils with generally finer textured soils occur towards the lowlying areas. However, in the case of the two plots surveyed, in the west (Plot 2 and 3), there estimated percentage clay is lower than the highlying areas, which can be explained by the lateral movement of water in the soil profile removing the finer material. The presence of both the Longlands and Fernwood soil forms confirms this observation (Soil Classification Workgroup 1991, Fey 2010), both these soil forms contain an E-horizon associated with the lateral movement of water in the soil profile.

The following species were recorded on the deeper soils to the west (Appendix D, Plot 2 and 3), namely: *Dicoma zeyheri*, *Diheteropogon amplectens*, *Diospyros lycioides*, *Gerbera viridifolia*, *Gnidia capitata*, *Heteropyxis natalensis*, *Ozoroa sphaerocarpa*, *Parinari capensis*, *Pentanisia angustifolia*, *Syzygium cordatum*, *Themeda triandra*.

The following species were on the shallow soils to the east (Appendix D, Plot 4 and 5), namely: *Acacia ataxacantha*, *Acalypha villicaulis*, *Aloe greatheadii*, *Zanthadesia species (5\_1978)*, *Bauhinia galpinii*, *Burkea africana*, *Cheilanthes viridis*, *Chloris gayana*, *Combretum apiculatum*, *Combretum molle*, *Combretum zeyheri*, *Crotalaria sphaerocarpa*, *Cussonia spicata*, *Cymbopogon excavatus*, *Englerophytum magalismontanum*, *Euphorbia ingens*, *Geigeria burkei*, *Gerbera jamesonii*, *Hibiscus species (4\_1955)*, *Hypoxis rigidula*, *Indigofera oxytropis*, *Lananea discolor*, *Lantana rugosa*, *Ledebouria floribunda*, *Lotononis foliosa*, *Merremia tridentata*, *Mundulea sericea*, *Opuntia ficus-indica*, *Orthosiphon*

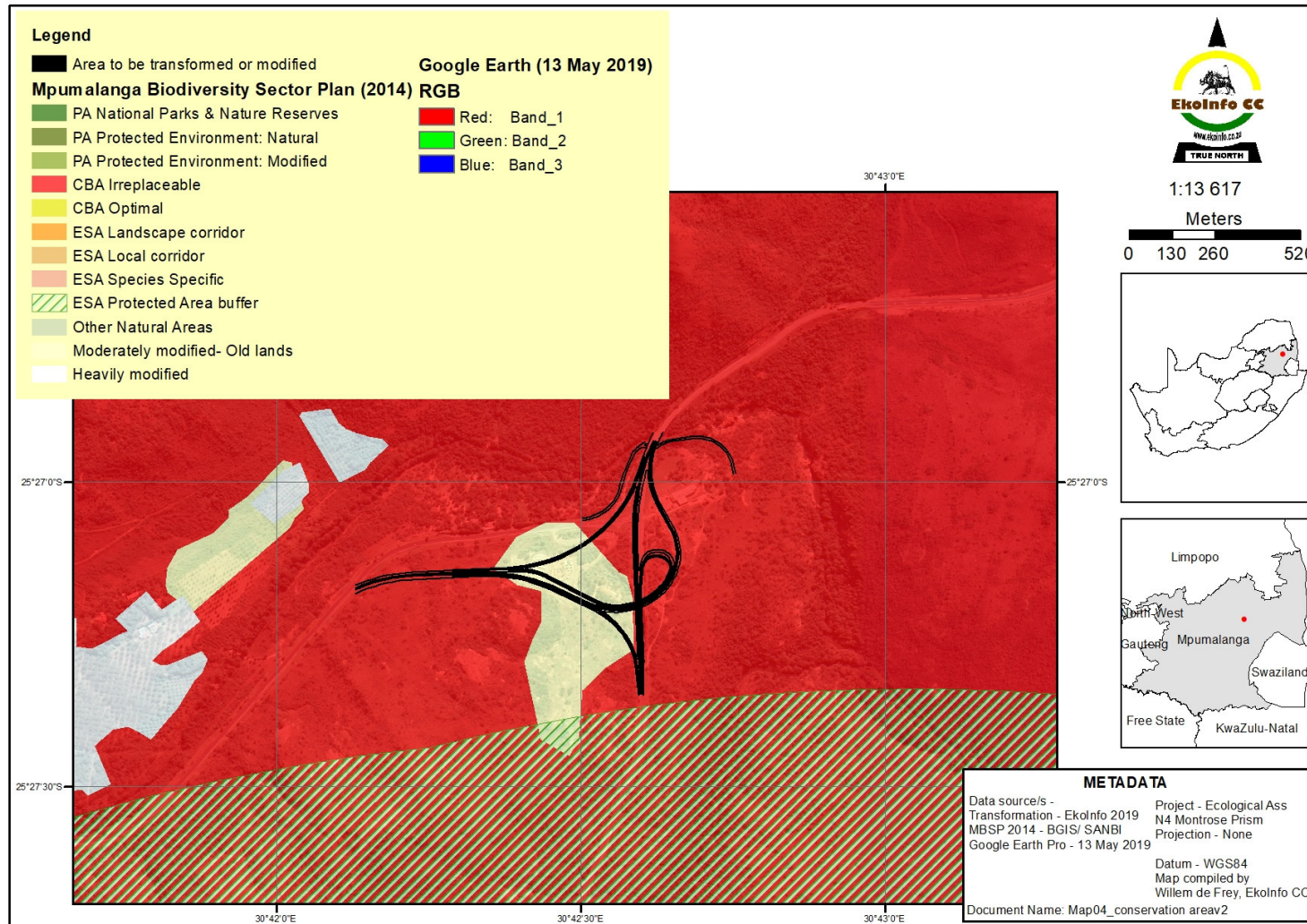


Figure 4: Distribution and extent of provincial areas of conservation concern associated with the interchange upgrade



**Table 1: Surface extent and percentage cover of areas of concern within the proposed interchange upgrade footprint**

<b>Mpumalanga Biodiversity Sector Plan (2014)</b>		<b>Hectares</b>	<b>% Cover</b>
<b>Category</b>	<b>Sub category</b>		
Heavily or moderately modified	Moderately modified- Old lands	1.2278	31%
Critical Biodiversity Area	CBA Irreplaceable	2.7263	69%
<b>TOTALS</b>		<b>3.9542</b>	<b>100%</b>

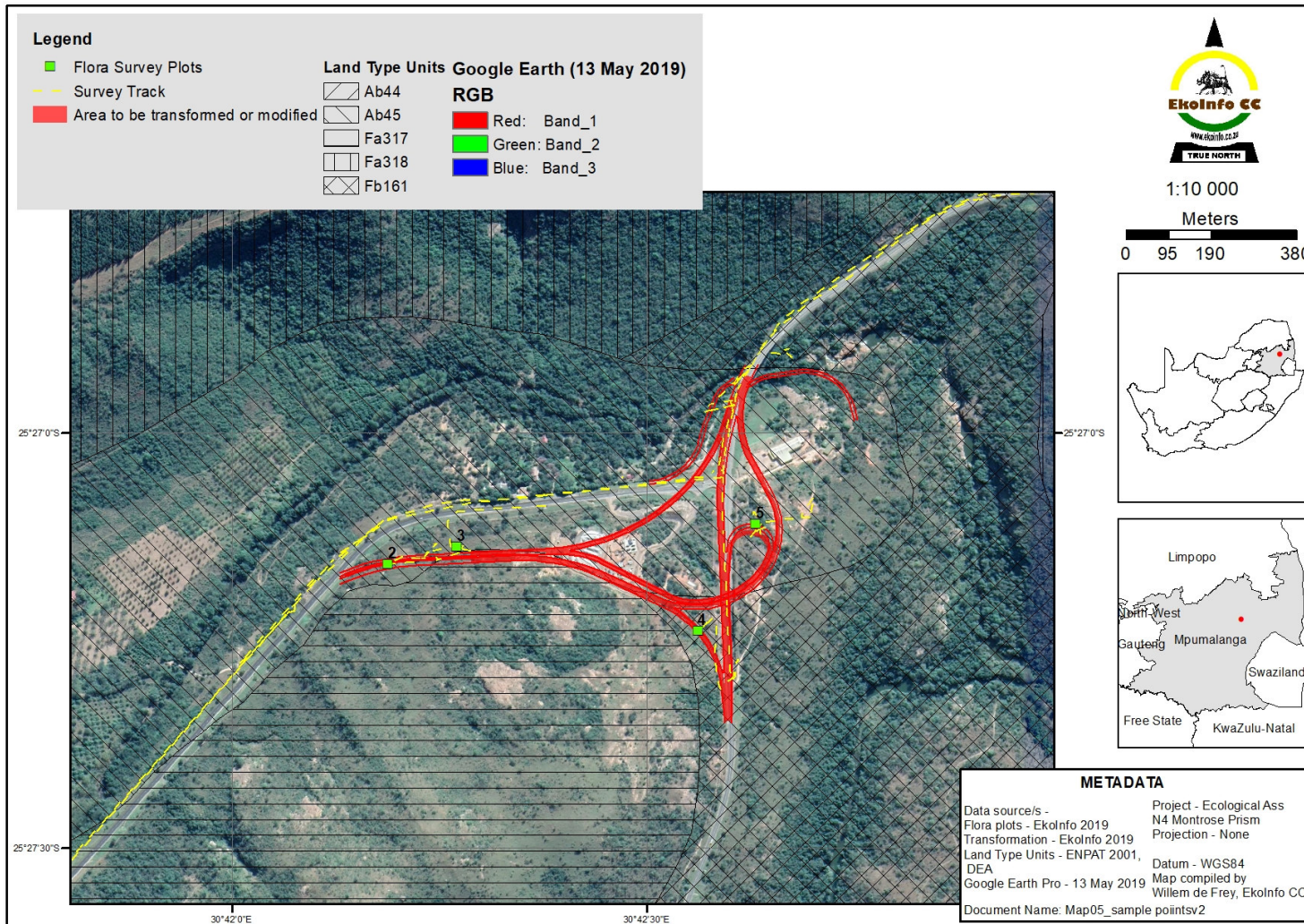


Figure 5: Distribution of the four sample plots based on expected soil variation

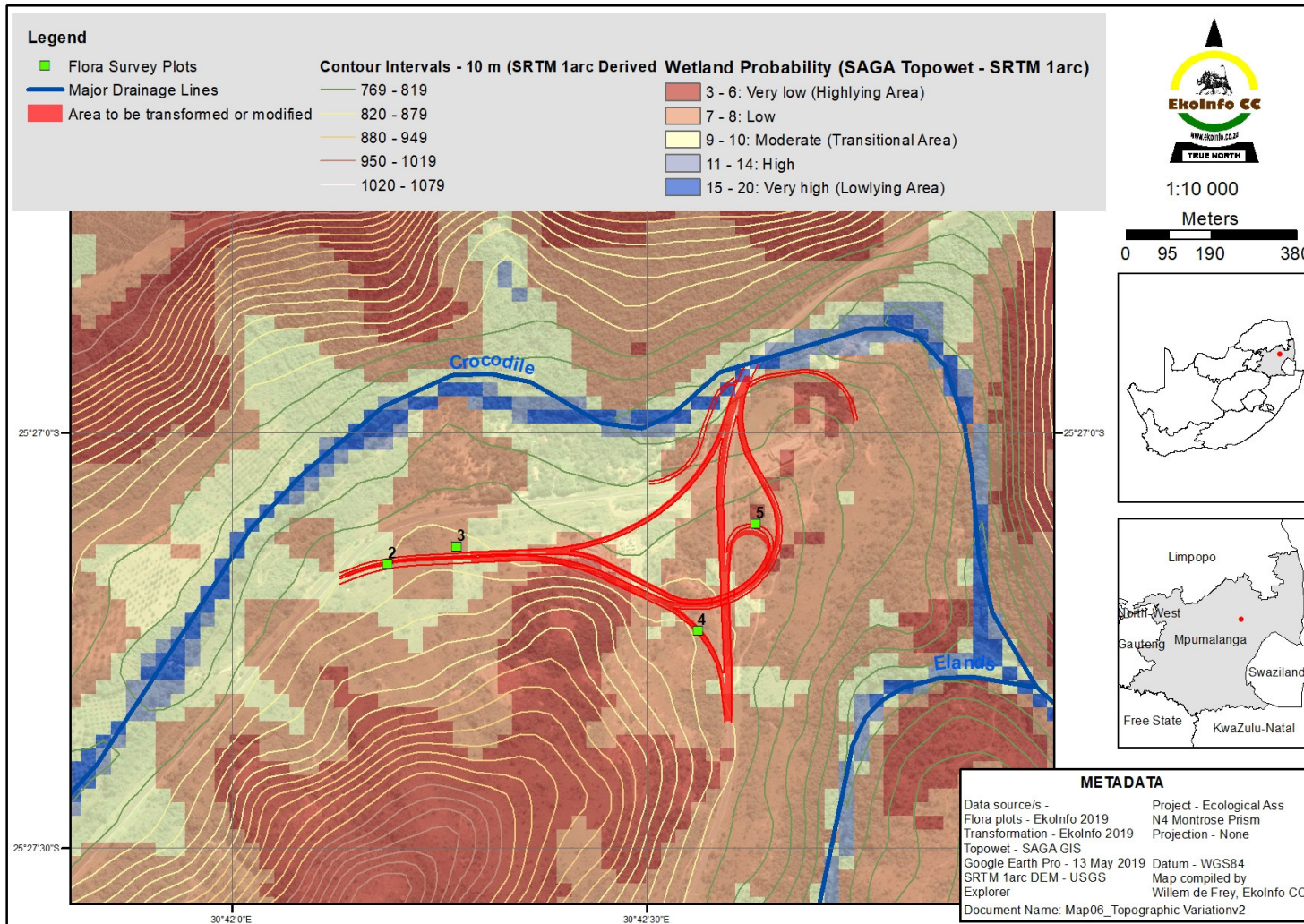


Figure 6: Topographic variation present within the proposed interchange upgrade area derived from the SRTM 1arc DEM

**Table 2: Environmental attributes extracted from the SRTM 1arc DEM**

Plot no	Environmental Attributes Extracted From The SRTM 1arc DEM			
	Altitude (m)	Slope (Degrees)	Wetness Index (Order of magnitude)	Aspect (Degrees from North)
2	829.3	6.0	7.9	323.0
3	832.4	7.0	7.5	14.9
4	837.1	7.2	7.0	69.4
5	824.8	3.3	6.2	5.5

*serratus*, *Raphionacme species (5\_1957)*, *Senecio oxyriifolius*, *Setaria lindenbergiana*, *Solanum giganteum*, *Sporobolus pectinatus*, *Sporobolus pyramidalis*, *Tagetes minuta*. The higher number of species recorded in these two plots, reflects the microhabitat presented by the rocks, compared to the more homogenous nature of the slopes. The lower number of species within plots two and three, could possibly also reflect the extreme conditions presented by the temporary waterlogged conditions in the soils, when soil moisture is sufficient for lateral flow to occur, Not all species can grow in the extreme conditions presented by seeps, which is either very wet or very dry.

Towards the north, upgrade of the interchange will occur along the Crocodile River (Figure 6), a transect was walked along this section, during it was noticed that typical riparian vegetation is present, with species such as *Syzygium cordatum* and *Breonadia salicina* (Photo 6). However, it is understood that the upgrade will not influence this area, with construction activities being kept to existing infrastructure.

Overall, the vegetation recorded is typical of the remaining natural areas within the landscape (Figure 7), it is evident that the landcover data cannot distinguish between the terrestrial vegetation on the midslope to crest, and the riparian vegetation within the valley bottom and foot slopes, nor does it reflect the currently transformed areas associated with factories or batching plants.

### **5.2.2 Species Diversity**

Sixty-nine species were recorded across the four survey plots, with the mean number of species being 25 species (Appendix D). The most species were recorded in plot five (39 species), and the least in plot three (14 species).

Of the 69 species recorded, 27 species were forbs (39%), nine species (13%) were gramnoids (grasses and sedges) and 33 species were woody species (trees and shrubs) (48%) (Table 3).

### **5.2.3 Species Of Concern**

No nationally protected species in terms of the National Environmental Management Biodiversity Act was recorded within the plots surveyed.

No threatened (Vulnerable, Endangered, Critical Endangered) Red Data species were recorded within the plots surveyed.

Two nationally protected trees in terms of the National Forest Act (1998) were recorded within the plots surveyed, namely *Pterocarpus angolensis* and *Sclerocarya birrea*. *Pterocarpus angolensis* occurred in all the plots surveyed (Appendix D), and *Sclerocarya birrea* occurred in 50% of the plots surveyed. A permit is required to destroy or remove these trees.

The following provincially protected species, genera and families were recorded in the plots surveyed: *Aloe* species (Photo 7), *Faurea saligna*, *Pterocarpus angolensis* and *Zanthadescia* species (Photo 8) (Table 4). A permit for the destruction of these species are only required if the developer is not the owner of the land, or if the species would be sold or translocated outside the province.

The following species with medicinal properties had been recorded within the plots surveyed: *Dombeya rotundifolia*, *Elephantorrhiza elephantina*, *Heteropyxis natalensis*, *Psidium guajava*, *Sclerocarya birrea*, *Syzygium cordatum* (Van Wyk, Van Oudtshoorn & Gericke 2000).

The following declared alien invasive species were recorded within the plots surveyed: *Lantana camara*, *Jacaranda mimosifolia*, *Opuntia ficus-indica*, *Psidium guajava* (Table 5). It should be noted that these species are declared in terms of both the Conservation of Agricultural Resources Act and the National Environmental Management Biodiversity Act Alien And Invasive Species Regulations. Category 1 species have to be eradicated or controlled, while permits are required for category 2 and 3 species.



**Photo 6: Example of the riparian fringe vegetation along the Crocodile River**

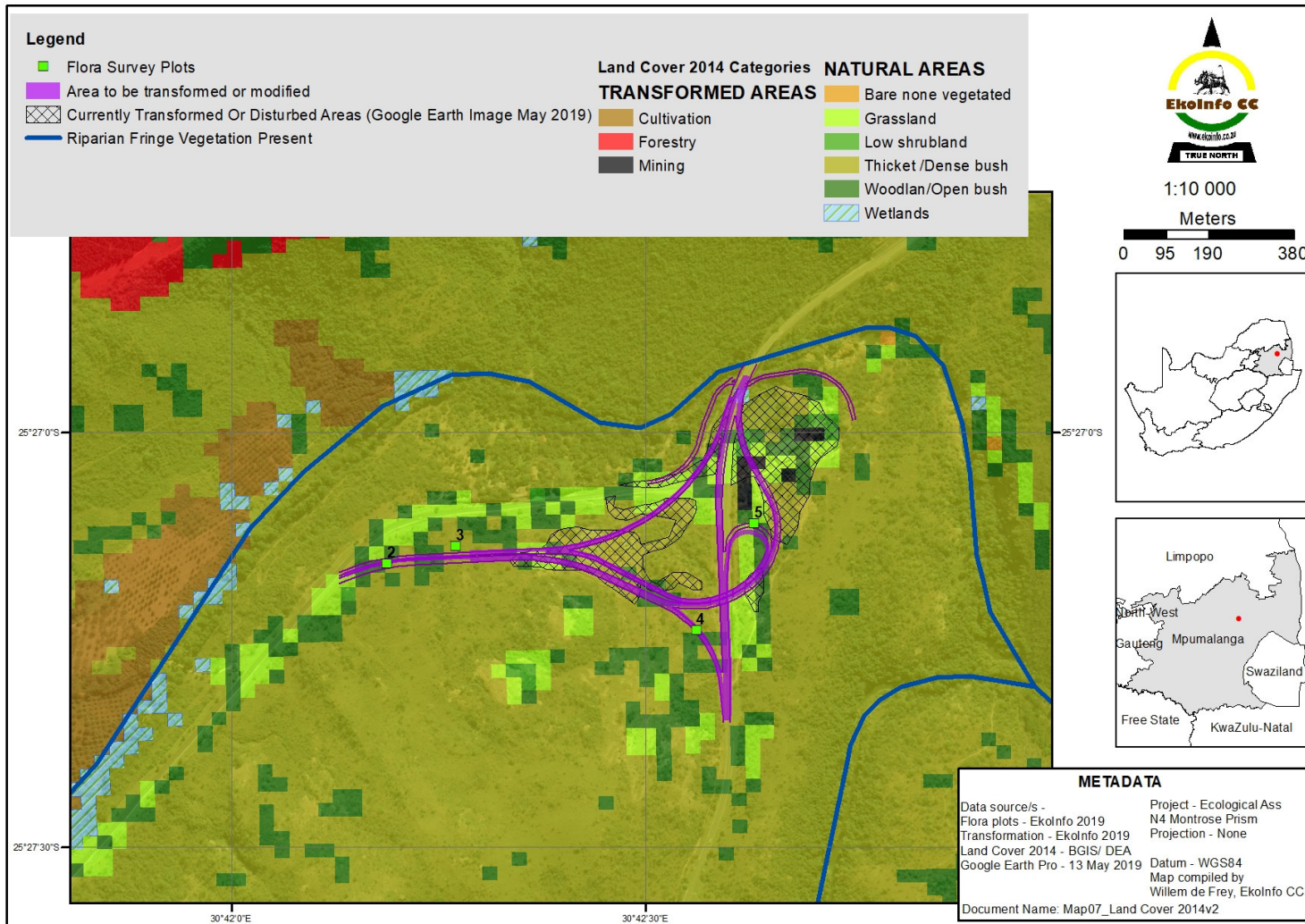


Figure 7: Overview of the overall intactness of the natural vegetation within the surrounding landscape

**Table 3: Overview of the number of species per major growth form recorded during the survey**

<b>Major Growth Form</b>	<b>No of species</b>	<b>% frequency</b>
Forbs	27	39%
Grasses	9	13%
Woodies	33	48%
<b>Grand Total</b>	<b>69</b>	<b>100%</b>





**Photo 7: A provincially protected *Aloe* species observed during the site visit**



**Photo 8: A provincially protected *Zanthadesia* species observed during the site visit**

**Table 4: List of provincially protected species observed during the site visit**

Observed species	Note
Aloe species	All species in the genus <i>Aloe</i> , Excluding - all species not occurring in Mpumalanga and the following species: <i>A. aculeata</i> , <i>A. ammophilla</i> , <i>A. arborescens</i> , <i>A. barbetoniae</i> , <i>A. castanae</i> , <i>A. davyana</i> , <i>A. globulligemma</i> , <i>A. grandidentata</i> , <i>A. lutescens</i> , <i>A. marlothii</i> , <i>A. mutans</i> , <i>A. parvibracteata</i> , <i>A. transvaalensis</i> , <i>A. wickensii</i>
Faurea saligna	All species in the family Proteacea
Pterocarpus angolensis	Species only
Zantedeschia species (5_1978)	All species in the genus <i>Zantedeschia</i>

**Table 5: List of declared alien invasive species observed during the site visit**

Species	Conservation of Agricultural Resources Act		NEMBA Alien And Invasive Species Regulations
	Category	Description	
Lantana camara	1	Category 1 plants are weeds and serve no useful economic purpose and possess characteristics that are harmful to humans, animals or the environment.	1b
Jacaranda mimosifolia	3	Category 3 plants are mainly used for ornamental purposes in demarcated areas but are proven plant invaders under uncontrolled conditions outside demarcated areas.	1b - except for urban areas, or within 50 m of farmhouses, if outside riparian areas
Opuntia ficus-indica	1	Category 1 plants are weeds and serve no useful economic purpose and possess characteristics that are harmful to humans, animals or the environment.	1b, except spineless cactus or fruit if used for human consumption
Psidium guajava	2	Category 2 plants are plants that are useful for commercial plant production purposes but are proven plant invaders under uncontrolled conditions outside demarcated areas.	2 in plantation or 3 elsewhere in Mpumalanga, fruit not listed if used for human consumption

#### 5.2.4 **Fauna Component**

Although the upgrade of the interchange will impact on habitat utilised by fauna, especially ground dwelling fauna, the animals are highly mobile in contrast to the plants. During the site visit no obvious signs of fauna activity were noted, and it was beyond the scope of the project to install motion cameras to detect animal activities.

Appendix F lists 135 mammal species which had been recorded within the 1-degree grid 2530<sup>3</sup> (Figure 8). The surrounding landscape represents a potential source for these species, especially the conservation areas present, while the drainage lines and ridges providing corridors for their movement (Hilty *et al* 2006). Some of the larger animals (antelope, jackal, baboons, leopard and hippopotamus) could collide with vehicles on the road, while the smaller animals' habitat (burrows) could be destroyed by the construction activities, however very few of these species are threatened (Table 6). Signs warning against the presence of hippopotamus were noted along the Crocodile River.

Appendix G lists 41 reptile species which had been recorded in the quarter degree grid 2530BC<sup>4</sup> (Figure 8). The search was restricted to the quarter degree grid instead of the 1-degree grid, because it is expected that the lizards and geckos will move over shorter distance than mammals and will therefore be more habitat specific, especially those species associated with outcrops/ surface rock. None of these species are threatened.

It is obvious, that it is unlikely that the interchange upgrade will affect flying animals such as the birds, bats and most of the invertebrate species. No nests of birds of prey was observed during the site visit, and it is most probably due to human activity already present in the area.

## 6 ENVIRONMENTAL IMPACT ASSESSMENT

The upgrade of the interchange will result in the removal of natural vegetation, associated with a threatened vegetation unit on a regional scale and Critical Biodiversity Area on a provincial scale, however taking in consideration the extent of the area involved, of less than four hectares, it cannot be considered that it would contribute significantly to habitat loss, whether for plants or animals within the immediate landscape.

Due to the existing road infrastructure, it is highly unlikely that the upgrade of the interchange would significantly contribute to incidents of roadkill as the animals present in the landscape is used to the existing road infrastructure and traffic volumes.

## 7 ENVIRONMENTAL MANAGEMENT PLAN

A vegetation scientist specialising in vegetation ecology should do a walkthrough prior construction commencing during the summer season, optimally January/ February to identify and mark protected plants for which permits are required. Those plants small enough to translocate could be temporarily stored in a nursery for re-introduction post construction.

It is strongly recommended that the topsoil from the natural areas be stored and used in the subsequent rehabilitation of the road reserve once construction had ended. The topsoil should be stored in low (1 m high), levelled stockpiles which would reduce the establishment of alien invasive species, as well as facilitate the control alien invasive species which could establish.

The upgrade of the interchange allows for an opportunity to increase the permeability of the road infrastructure to facilitate animal movement in the landscape. Therefore, culverts should be designed to allow movement for small to medium size mammals to and from a water source such as the Crocodile River, this is especially relevant for the section towards the west.

<sup>3</sup> FitzPatrick Institute of African Ornithology (2019). MammalMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=MammalMAP> on 2019-11-10

<sup>4</sup> FitzPatrick Institute of African Ornithology (2019). ReptileMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=ReptileMAP> on 2019-11-10

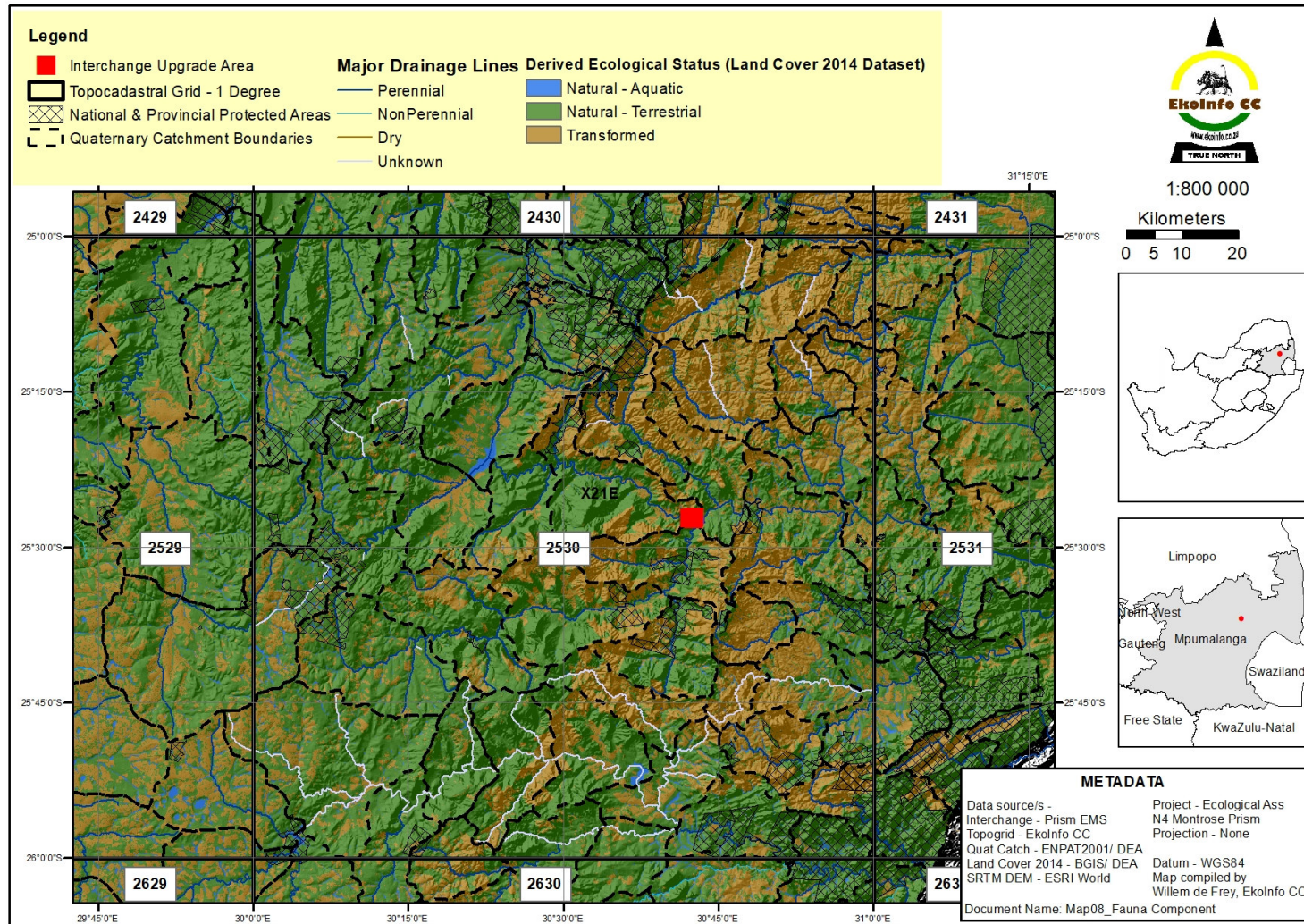


Figure 8: Overview of the ecological status of the surrounding landscape which could be a source of ground dwelling animals

**Table 6: Overview of the Red Data status, collision risk and habitat loss risk for the mammals that could occur potentially in the landscape**

Family	Family Overview	Status Unknown	Introduced	Red Data Categories				Grand Total	Collision Risk	Habitat Loss Risk
				Least Concern	Near Threatened	Vulnerable	Endangered			
Bathyergidae	Mole rats			1				1	Low	High
Bovidae	Antelope			12	2		1	15	High	Low
Canidae	Jackals, Wilddogs, Foxes			3			1	4	High	Moderate
Cercopithecidae	Monkeys, Baboons	1		4	1			6	High	Low
Chrysochloridae	Golden Moles					1		1	Low	High
Emballonuridae	Bats			1				1	Low	Low
Equidae	Zebra		1	1				2	High	Low
Erinaceidae	Hedgehog				1			1	Low	Moderate
Felidae	Lion, Leopard, Cerval, Cats		1	3	1	1		6	High	Low
Galagidae	Bush baby			1				1	Low	Low
Gliridae	Mouse	1		1				2	Low	High
Herpestidae	Mongoose, Meerkat			8				8	Moderate	High
Hippopotamidae	Hippopotamus			1				1	High	Low
Hipposideridae	Bats			1			1	2	Low	Low
Hyaenidae	Hyaena, Aardwolf			1	1			2	Moderate	Moderate
Hystricidae	Porcupine			1				1	Moderate	High
Leporidae	Hares			3				3	Low	Moderate
Molossidae	Bats			3				3	Low	Low
Muridae	Rats, Mouses	6		12	1			19	Low	High
Mustelidae	Otters, Polecat, Honey badger			3	2			5	Moderate	Low
Nesomyidae	Mouses			3				3	Low	High
Nycteridae	Bats			1				1	Low	Low
Orycteropodidae	Aardvark			1				1	Moderate	Low

Family	Family Overview	Status Unknown	Introduced	Red Data Categories				Grand Total	Collision Risk	Habitat Loss Risk
				Least Concern	Near Threatened	Vulnerable	Endangered			
Procaviidae	Hyrax			1				1	Low	Moderate
Pteropodidae	Bats	1		2				3	Low	Low
Rhinolophidae	Bats	1		3	2	2		8	Low	Low
Soricidae	Shrews	2		7	1	2		12	Low	High
Suidae	Bush pig	1		2				3	Moderate	Moderate
Vespertilionidae	Bats	4		9	1			14	Low	Low
Viveridae				1				1		
Viverridae	Genets	1		3				4	Low	High
Grand Total		18	2	93	13	6	3	135		
% Frequency		13%	1%	69%	10%	4%	2%	100%		

## 8 SPECIALIST OPINION

Due to the fact that the upgrade of the interchange is not a green fields project, but involves the improvement of existing road infrastructure, it is the opinion of the specialist that the proposed activity will not significantly add to the habitat loss and – fragmentation in the landscape. It contributes less than 1% (4 ha) to transformation within quaternary catchment X21E in which it is located (Figure 8, Table 7). For a development to stimulate or result in one percent (1%) land use change within the quaternary catchment it would require 346 ha.

However, it does provide an opportunity to improve the permeability of the road in terms of animal movement, by improving the design of culverts and storm water drains to facilitate the movement of small to medium size animals and herpetofauna.

Therefore, the proposed activity cannot be considered a no-go.

**Table 7: Overview of the potential transformation contribution due to the upgrade within quaternary catchment X21E**

Land Cover 2014 categories	Derived Ecological Status			Grand Total	% Cover
	Natural - Aquatic	Natural - Terrestrial	Transformed		
Bare none vegetated		21		21	0%
Cultivated comm fields (high)			97	97	0%
Cultivated comm fields (low)			51	51	0%
Cultivated comm fields (med)			435	435	1%
Cultivated orchards (high)			789	789	2%
Cultivated orchards (low)			24	24	0%
Cultivated orchards (med)			288	288	1%
Grassland		6332		6332	18%
Indigenous Forest		2481		2481	7%
Low shrubland		39		39	0%
Mines 1 bare			0	0	0%
Mines 2 semi-bare			0	0	0%
Plantation / Woodlots clearfelled			771	771	2%
Plantation / Woodlots young			267	267	1%
Plantations / Woodlots mature			8630	8630	25%
Thicket /Dense bush		10002		10002	29%
Urban built-up (bare)			0	0	0%
Urban built-up (dense trees / bush)			37	37	0%
Urban built-up (low veg / grass)			5	5	0%
Urban built-up (open trees / bush)			4	4	0%
Water permanent	7			7	0%
Water seasonal	4			4	0%
Wetlands	306			306	1%
Woodland/Open bush		3999		3999	12%
<b>Grand Total</b>	<b>317</b>	<b>22874</b>	<b>11399</b>	<b>34589</b>	<b>100%</b>



Land Cover 2014 categories	Derived Ecological Status			Grand Total	% Cover
	Natural - Aquatic	Natural - Terrestrial	Transformed		
% Cover	1%	66%	33%	100%	
Interchange Upgrade Transformation				4	
% of quaternary catchment (34 589 ha = 100%)				0.01%	
% of terrestrial natural in quaternary catchment (22 874 ha = 100%)				0.02%	
% of quaternary catchment: grassland, thicket/ dense bush, woodland/ Open bush (20 333 ha = 100%)				0.02%	

## 9 REFERENCES

- BARBOUR, M.G., BURK, J.H. & PITTS, W.D. 1980. *Terrestrial Plant Ecology*. Benjamin/Cummings Publishing Company, California.
- BROMILOW, C. 2010. *Probleemplanten en Indringeronkruiden van Suid - Afrika*. Briza Publikasies BK
- BROWN, L.R., DU PREEZ, P.J., BEZUIDENHOUT, H., BREDEKAMP, G.J., MOSTERT, T.H.C. & COLLINS, N.B., 2013. 'Guidelines for phytosociological classifications and descriptions of vegetation in southern Africa', *Koedoe* 55(1), Art. #1103, 10 pages. <http://dx.doi.org/10.4102/koedoe.v55i1.1103>
- BOTHMA, J du P. 1995. *Wildspasbestuur Nuwe uitgebreide uitgawe*. 2de Uit. Struik Uitgewers
- COATES-PALGRAVE, M. 2002. *Keith Coates-Palgrave Trees of Southern Africa*, 3rd edn, 2nd imp. Struik Publishers, Cape Town
- COWAN, G.I. (ed) 1995. *Wetlands of South Africa*. Department of Environmental Affairs and Tourism, Pretoria
- DE FREY, W.H. 1999. *PHYTOSOCIOLOGY OF SOUTHEASTERN MPUMALANGA HIGH ALTITUDE GRASSLANDS*. MSc. Thesis, University of Pretoria.
- DWAF. 2005. *A practical field procedure for identification and delineation of wetlands and riparian areas*. Department of Water Affairs and Forestry
- EDWARDS, D. 1983. A broad-scale structural classification of vegetation for practical purposes. *Bothalia* 14, 3 & 4: 705 - 712.
- EWART-SMITH, J., OLLIS, D., DAY, J & MALAN, H 2006. *NATIONAL WETLAND INVENTORY: Development of a Wetland Classification System for South Africa*. The Water Research Commission (WRC)
- FEY, M. 2010. *Soils of South Africa*. Cambridge
- GERMISHUIZEN, G & MEYER, N.L. (eds) 2003. *Plants of southern Africa: an annotated checklist*. *Strelitzia* 14. National Botanical Institute, Pretoria.
- GEO 5 2012. *Global Environment Outlook*. UNEP  
[http://www.unep.org/geo/sites/unep.org/geo/files/documents/geo5\\_report\\_full\\_en\\_0.pdf](http://www.unep.org/geo/sites/unep.org/geo/files/documents/geo5_report_full_en_0.pdf)
- GIBBS RUSSELL, G.E., WATSON, L., KOEKEMOER, M., SMOOK, L. BARKER, N.P., ANDERSON, H.M. & DALWITZ, M.J. 1990. *GRASSES OF SOUTHERN AFRICA*. National Botanical Gardens, South Africa
- GOLDING, J (Ed.s), 2002. *Southern African Plant Red Data Lists*. Sabonet Report no. 14. Southern African Botanical Diversity Network. Pretoria
- HENNEKENS, S.M. 1996. *TURBO(VEG) Software package for input, processing, and presentation of phytosociological data. User's guide*. University of Lancaster.
- HILTY, J.A., LIDICKER JR., W.Z. & MERENLENDER, A.M. 2006. *CORRIDOR ECOLOGY The Science and Practice of Linking Landscapes for Biodiversity Conservation*. Island Press
- JOHNSON, M.R., ANHAEUSSER, C.R. & THOMAS, R.J. (Eds) 2006. *The Geology of South Africa*. Geological Society of South Africa, Johannesburg/ Council of Geoscience, Pretoria, 691 pp
- KENT, M. & COKER, P. 1992. *Vegetation Description and Analysis: A practical Approach*. John Wiley & Sons, Chichester

- KOVACH, W.L., 2007. MVSP - A MultiVariate Statistical Package for Windows, ver. 3.1. Kovach Computing Services, Pentraeth, Wales, U.K.
- KRUGER, G.P. 1983. 1: 2 500 000 scale. Terrain morphological map of southern Africa Soil & Irrigation Institute. Dept. of Agriculture.
- LAND TYPE SURVEY STAFF. 1985. Land types of the maps 2628 East Rand, 2630 Mbabane. Mem. agric. nat. Resour. S. Afr. No. 5
- LAND TYPE SURVEY STAFF. 1987. Land types of the maps 2526 Rustenburg, 2528 Pretoria. Mem. agric. nat. Resour. S. Afr. No. 8
- LE ROUX, J. 2002. The Biodiversity of South Africa 2002 Indicators, Trends and Human Impacts. Endangered Wildlife Trust
- LEISTNER, O.A. (ed) 2000. Seed plants of southern Africa: families and genera. Strelitzia 10. National Botanical Institute, Pretoria
- LINDENMAYER, D.B. & FISCHER, J. 2006. Habitat Fragmentation And Landscape Change An Ecological And Conservation Synthesis. Island Press, USA
- MC MURTY, D., GROBLER, L, GROBLER, J. & BURNS, S. 2008. Field Guide to the ORCHIDS of Northern South Africa and Swaziland. Umdaus Press, Hatfield
- McCARTHY, T. & RUBIDGE, B. 2005. The Story Of EARTH & LIFE A southern African perspective on a 4.6-billion-year journey. Struik Publishers
- MUCINA, L. & RUTHERFORD, M.C. (eds) 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.
- NEL, J., MAREE, G., ROUX, D., MOOLMAN, J., KLEYNHANS, N., SILBERBAUER, M. & DRIVER, A. 2004. South African National Spatial Biodiversity Assessment 2004: Technical Report. Volume 2: River Component. CSIR Report Number ENV-S-I-2004-063. Council for Scientific
- NEL, J.L., DRIVER, A., STRYDOM, W.F., MAHERRY, A., PETERSEN, C., HILL, L., ROUX, D.J., NIENABER, S., VAN DEVENTER, H., SWARTZ, E., & SMITH-ADAO, L.B. 2011. *Atlas of Freshwater Ecosystem Priority Areas in South Africa: Maps to support sustainable development of water resources*. WRC Report No. TT 500/11
- READ, H.H. & WATSON, J. 1983. Introduction to Geology Volume 1 PRINCIPLES. Macmillan Press Ltd, Hong Kong
- NORMAN, N. & WHITFIELD, G. 2006. A traveller's guide to South Africa's rocks and landforms Geological Journeys. Struik Publishers
- RETIEF, E. & HERMAN, P.P.J. 1997. Plants of the northern provinces of South Africa: keys and diagnostic characters. Strelitzia 6: 1 – 681.
- ROUGET, M., REYERS, B., JONAS, Z., DESMET, P., DRIVER, A., MAZE, K., EGOH, B. & COWLING, R.M. 2004. South African National Spatial Biodiversity Assessment 2004: Technical Report. Volume 1: Terrestrial Component. Pretoria: South African National Biodiversity Institute.
- SMIT, N. 2008. Field Guide to the Acacias of South Africa. Briza Publications
- SOIL CLASSIFICATION WORKGROUP 1991. Soil classification a taxonomic system for South Africa. Memiors oor die Natuurlike Landbouhulpbronne van Suid-Afrika Nr. 15.
- STRAHLER, A.N. & STRAHLER, A.H. 1987. Modern Physical Geography Third Edition. Wiley & Sons, New York

- STRAHLER, A.N. 1962. Physical Geography. John Wiley & Sons, New York
- TAINTON, N. 1999. Veld Management in South Africa. University of Natal Press
- TURNER, M.G., GARDNER, R.H., & O'NEILL, R.V. 2001. Landscape Ecology In Theory And Practice Pattern And Process. Springer, USA
- VAN ANDEL, J & ARONSON, J (Eds). 2006. RESTORATION ECOLOGY - The New Frontier. Blackwell Publishing
- VAN OUDTSHOORN, F.P. 1991. Gids tot grasse van Suid-Afrika. Briza Publikasies Bk. Arcadia.
- VAN WYK, A.E. & SMITH, G.F. 2001. Regions of Floristic Endemism in Southern Africa. Umdaus Press, Hatfield
- VAN WYK, B. & MALAN, S. 1988. Veldgids tot die veldblomme van die Witwatersrand- & Pretoria-gebied. Struik Uitgewers, Kaapstad.
- VAN WYK, B-E., VAN OUDTSHOORN, B. & GERICKE, N. 2000. Medicinal Plants of South Africa. Briza
- VAN WYK, B. & VAN WYK, P. 1997. Field Guide to Trees of Southern Africa. Struik Nature, Cape Town
- VAN WYK, B., VAN WYK, P. & VAN WYK, B-E. 2000. Photo Guide to Trees of Southern Africa. Briza Publications
- VILJOEN, M.J. & REIMOLD, W.U. 1999. An Introduction to South Africa's Geological and Mining Heritage. Mintek
- WHITE, R.E. 1987. Introduction to the Principles and Practice of Soil Science. Blackwell Scientific Publications, Australia
- WIENS, J.A., MOSS, M.R., TURNER, M.G. & MLADENOFF, D.J. 2006. Foundation Papers In Landscape Ecology. Columbia University Press, New York

## 10 APPENDIX A – ABRIDGE CV, PRINCIPLE CONSULTANT

Name of firm: EkolInfo cc Environmental and Wildlife Management Consultancy  
 Name of staff: WILLEM HENDRIK DE FREY  
 Profession: Environmental and Wildlife Management consultant  
 Years with firm: Since 1995  
 Nationality: RSA  
 Membership of professional societies:  
     The South African Council for Natural Scientific Professions (Reg no 400100/02)  
         Categories: Botanical Science and Ecological Science  
 Currently in the process of affiliating to:  
     South African Association of Botanist (SAAB)  
     Grassland Society of Southern Africa  
     South African Institute of Ecologist and Environmental Scientists (SAIE)

### KEY QUALIFICATIONS:

Mr W de Frey has been involved in the discipline of ecology since 1989. During this period he prepared himself for a profession in environmental and wildlife management, by attending courses in chemistry, geology, pedology and statistics, while majoring in Botany and Zoology. His working knowledge was obtained while completing projects for his post-graduate studies in wildlife management in both the Savanna and Grassland Biomes. In addition to his academic publications, he has contributed to numerous reports regarding EMPR's, EIA's, vegetation - and soil surveys and monitoring since the registration of his own consultation close corporation in 1995. He is actively involved in the management and marketing of his close corporation while completing tasks in his field of expertise namely soil, vegetation science and Geographical Information Systems. Mr W de Frey is task orientated with consideration of people's needs and safety. He believes in a holistic approach to environmental and wildlife management and has therefore established a network with individuals in related fields. He is also assisting previously disadvantaged persons in establishing a presence in the environmental industry, namely Lordwick Makhura of Baagi Environmental Consultancy CC and a joint venture company Bonolo Biodiversity And Environmental Management consisting of Baagi Environmental Consultancy CC and Disa Mphago Community Helpers CC.

### EDUCATION:

1992 BSc Botany & Zoology, University of Pretoria

Course	Content	Level
Chemistry	Organic and Inorganic chemistry	1 <sup>st</sup> year
Geology	Introduction/ Geomorphology, Stratigraphy, Structural, Sedimentology Palaeontology, Crystallography	1 <sup>st</sup> and 2 <sup>nd</sup> year
Pedology	Introduction, soil classification, soil fertility, soil ecology, soil physics	1 <sup>st</sup> and 2 <sup>nd</sup> year
Botany	Morphology, Anatomy, Physiology, Taxonomy, Mycology, Ecology, Reproductive biology	1 <sup>st</sup> , 2 <sup>nd</sup> and 3 <sup>rd</sup> year
Zoology	Taxonomy (Vertebrates and Invertebrates), Physiology (mainly vertebrates), Ecology (mainly vertebrates), Animal behaviour (mainly vertebrates)	1 <sup>st</sup> , 2 <sup>nd</sup> and 3 <sup>rd</sup> year
Statistics	Sampling methods, Statistical Analysis, Probabilities	1 <sup>st</sup> year

1993 BSc (Hons) (Cum laude) Wildlife Management, University of Pretoria

Dissertation: 'N HOLISTIESE EKOLOGIESE BENADERING TOT DIE DRAKRAGBEPALING VAN 'N GEMENGDE WILD- EN BEESBOERDERY IN DIE UBOMBO DISTRIK, MET ENKELE BESTUURS AANBEVELINGS, 1993

1999 MSc (Cum laude) Wildlife Management, University of Pretoria

Thesis: PHYTOSOCIOLOGY OF THE MPUMALANGA HIGH ALTITUDE GRASSLANDS, 1999

**COURSES/ WORKSHOPS ATTENDED**

1. Red List And Threatened Species Assessment Training Workshop, Hosted by the Conservation Breeding Specialist Group Southern Africa & Endangered Wildlife Trust, December 2003
2. National State of the Environment Workshop, Hosted by DEAT and SRK, ESKOM Convention Centre – November 2004
3. Gauteng Red Data Flora Workshop, Hosted by SANBI and GDACE – November 2005
4. Gauteng Flora Minimum Requirement Workshop, Hosted by GDACE Nature Conservation – August 2007

**EMPLOYMENT RECORD:**

1986 – 1987

5 Signals Regiment, SADF

1998 – 1993 – Partime

Council of Geoscience, Palaeontology Section

University of Pretoria, Botany Department

Academy of Marksmanship, Range Officer

U Huisoppasser, Own enterprise

1994 – 1995

University of Pretoria, Botany Department, Assistant researcher

1995 – present

EkolInfo cc Environmental and Wildlife Management Consultancy, Founding member and consultant

Overall EkolInfo CC's principal consultant completed or administrated more than 58 vegetation studies as part of Environmental Impact Assessments within all of South Africa's nine provinces and adjacent countries such as Botswana and Mozambique with a focus on either terrestrial vegetation and/ or wetlands. Some projects were on provincial level such as the Mpumalanga and Gauteng Degradation Projects coordinated by the Institute for Soil, Climate and Water and sponsored by National Department of Agriculture. The majority of projects were on local scale from 5 ha to 50 000 ha or more for local developers and corporate institutions (SASOL, Anglo Coal, BHP Billington, Ingwe Coal, Deneys Rietz Attorneys, ESKOM) facilitated independently or as a subcontractor/ specialist for the following institutions: Oryx Environmental CC, African EPA, Arcuss Gibb, Digby Wells and Associates, Nature and Business Alliance and Eyethu Engineers, Strategic Environmental Focus.

**COMMUNITY SERVICE**

1. Substitute lecture – 2nd & 3rd year Botany Practical (Vegetation Survey Methods), University of Pretoria -1994 & 1995
2. Guest lecture – Wetland Vegetation Communities (2nd year students), Department of Landscape Architecture, University of Pretoria – 1996 & 1997
3. Guest lecture – Principles of Ecology (1st year students), Department of Landscape Architecture, University of Pretoria – 2002
4. Guest lecture – Principles of vegetation survey and mapping for EIA's (3rd year students), Department of Landscape Architecture, University of Pretoria – 2003
5. Referee – ILASA Merits Awards (Environmental Planning), Institute for Landscape Architects of South Africa - 2003


**LANGUAGES:**

Language	Capability
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English & Afrikaans	Speak, Read, Write - sufficient
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Sepedi (Northern Sotho)	Speak, Read, Write – insufficient
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# 11 APPENDIX B – NATIONALLY PROTECTED AND THREATENED PLANTS


**Red List of South African Plants**

[Red List statistics](#) | 
 [Summary of recent changes](#) | 
 [National Red List categories](#) | 
 [Assessment methodology](#) | 
 [Glossary](#) | 
 [Guidelines for EIAs](#)

**Browse**

- [Genera: A](#)
- [Genera: B](#)
- [Genera: C](#)
- [Genera: D](#)
- [Genera: E](#)
- [Genera: F](#)
- [Genera: G](#)
- [Genera: H](#)
- [Genera: I](#)
- [Genera: J](#)
- [Genera: K](#)
- [Genera: L](#)
- [Genera: M](#)
- [Genera: N](#)
- [Genera: O](#)
- [Genera: P](#)
- [Genera: Q](#)
- [Genera: R](#)
- [Genera: S](#)
- [Genera: T](#)
- [Genera: U](#)
- [Genera: V](#)
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- [Genera: X](#)
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- [Genera: Z](#)

Home >> [Genera: A](#) >> [Genus: Aloe](#)

## Aloe simii

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**Taxonomy**

**Scientific Name** **Aloe simii** Pole-Evans  
**Higher Classification** Monocotyledons  
**Family** ASPHODELACEAE

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**National Status**

**Status and Criteria** **Critically Endangered B2ab(ii,iii,iv,v)**  
**Assessment Date** 2006/11/15  
**Assessor(s)** M. Lötter, J.E. Burrows, S. Krynauw & D. Raimondo  
**Justification** A narrow habitat specialist (AOO 10 km<sup>2</sup>) and known from five severely fragmented subpopulations. Declining due to afforestation, drying up of its wetland habitat as a result of adjacent plantations and water extraction, alien plant invasion, urban expansion and rural development.

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**Distribution**

**Endemism** South African endemic  
**Provincial distribution** Mpumalanga  
**Range** Sable southwards to White River and around Nelspruit.

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**Habitat and Ecology**

**Major system** Terrestrial  
**Major habitats** Legogote Sour Bushveld  
**Description** Open woodland and grassland, along drainage lines and wetlands, 600-1100 m.

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**Threats**

Habitat loss, Invasive Alien Species (direct effects), Habitat degradation

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<http://redlist.sanbi.org/species.php?species=2206-235>

## 12 APPENDIX C – ENVIRONMENTAL DATA RECORDED

Relevé number:	2	3	4	5
Date (yy/mm/dd):	2019/10/08	2019/10/08	2019/10/08	2019/10/08
Surveyor:	wdf	wdf	wdf	wdf
Photo no:	110- 113, 114	115- 118, 119	100- 103, 104	105- 108, 109
Photo direction (Bearing):	n, e, s, w, soil	n, e, s, w, soil	n, e, s, w, soil	n, e, s, w, soil
Notes	amv02 -	avm03 - hypa hir - acac sie woodland	amv04 - hypa hir - acac sie woodland, possible old quary	avm05 - loud fla - cuss nat woodland
Altitude (m):	832	827	814	806
Aspect (Bearing):		n	w	e
Slope (%):	3	5	3	1
Terrain unit	Midslope	Midslope	Crest	Crest
Petrology:			igneous	ingenous
Lithology:			granite	granite
Soil form	Longlands	Fernwood	Glenrosa	Glenrosa
Termitaria present	TRUE	FALSE	FALSE	FALSE
Cover: Gravel -	0	0	0	5
Cover: Small stones -	0	0	0	5
Cover: Medium stones -	0	0	0	10
Cover: Large stones -	0	0	5	20
Rock:	0	0	10	30
Soil depth (mm):	750	400	300	100
Surface crusting:	FALSE	FALSE	FALSE	FALSE
Estimate % Clay (A-horizon):	9	10	17	12
Cover total (%):	80	85	75	75
Cover tree layer (%):	5	10	10	10
Cover shrub layer (%):	15	15	15	15
Cover herb layer (%):	60	60	50	50
Cover grass layer (%):	55	55	45	45
Cover forbs layer (%):	5	5	5	5
Cover bare rock (%):	0	0	0	50
Height (highest) trees (m):	8	10	6	8
Height lowest trees (m):	4	4	2	3
Height (highest) shrubs (m):	3.5	2.5	2.5	4
Height lowest shrubs (m):	1	1	1	1
Aver height (high) herbs (cm):	50	50	25	10
Aver height lowest herbs (cm):	10	10	5	5
Maximum height herbs (cm):	125	150	150	100
Maximum height cryptogams (mm):	0	0	0	0



### 13 APPENDIX D – FLORA SPECIES RECORDED

Botanical Names	Plot no					Plot no				% Frequency
	2	3	4	5		2	3	4	5	
Dicoma zeyheri	+					1	0	0	0	25%
Diheteropogon amplexans	+					1	0	0	0	25%
Gerbera viridifolia	+					1	0	0	0	25%
Gnidia capitata	+					1	0	0	0	25%
Heteropyxis natalensis	1					1	0	0	0	25%
Parinari capensis	+					1	0	0	0	25%
Pentania angustifolia	+					1	0	0	0	25%
Themeda triandra	2a					1	0	0	0	25%
Diospyros lycioides		+				0	1	0	0	25%
Ozoroa sphaerocarpa		+				0	1	0	0	25%
Syzygium cordatum		+				0	1	0	0	25%
Acalypha villicaulis			+			0	0	1	0	25%
Chloris gayana			+			0	0	1	0	25%
Crotalaria sphaerocarpa			+			0	0	1	0	25%
Cymbopogon excavatus			1			0	0	1	0	25%
Geigeria burkei			+			0	0	1	0	25%
Hibiscus species (4_1955)			+			0	0	1	0	25%
Lotononis foliosa			+			0	0	1	0	25%
Merremia tridentata			+			0	0	1	0	25%
Mundulea sericea			+			0	0	1	0	25%
Solanum giganteum			+			0	0	1	0	25%
Sporobolus pyramidalis			+			0	0	1	0	25%
Acacia ataxacantha				+		0	0	0	1	25%
Aloe greatheadii				+		0	0	0	1	25%
Zanthadescia species (5_1978)				r		0	0	0	1	25%
Bauhinia galpinii				+		0	0	0	1	25%
Burkea africana				+		0	0	0	1	25%
Cheilanthes viridis				+		0	0	0	1	25%
Combretum apiculatum				+		0	0	0	1	25%
Combretum molle				+		0	0	0	1	25%
Combretum zeyheri				+		0	0	0	1	25%
Cussonia spicata				+		0	0	0	1	25%
Englerophytum magalismsontanum				+		0	0	0	1	25%
Euphorbia ingens				+		0	0	0	1	25%
Gerbera jamesonii				+		0	0	0	1	25%
Hypoxis rigidula				+		0	0	0	1	25%
Indigofera oxytropis				+		0	0	0	1	25%
Lansea discolor				+		0	0	0	1	25%
Lantana rugosa				+		0	0	0	1	25%
Ledebouria floribunda				+		0	0	0	1	25%

Botanical Names	Plot no					Plot no				% Frequency
	2	3	4	5		2	3	4	5	
Opuntia ficus-indica				1		0	0	0	1	25%
Orthosiphon serratus				+		0	0	0	1	25%
Raphionacme species (5_1957)				+		0	0	0	1	25%
Senecio oxyriifolius				+		0	0	0	1	25%
Setaria lindenbergiana				+		0	0	0	1	25%
Sporobolus pectinatus				+		0	0	0	1	25%
Tagetes minuta				+		0	0	0	1	25%
Rhus transvaalensis	+	+				1	1	0	0	50%
Faurea saligna	+		+			1	0	1	0	50%
Senecio venosus	+		+			1	0	1	0	50%
Elephantorrhiza elephantina	+			+		1	0	0	1	50%
Loudetia flavida	+			1		1	0	0	1	50%
Pterocarpus rotundifolius	+			+		1	0	0	1	50%
Sebaea grandis	+			+		1	0	0	1	50%
Acacia sieberiana		2b	3			0	1	1	0	50%
Helichrysum nudifolium		+	+			0	1	1	0	50%
Lantana camara		+	+			0	1	1	0	50%
Psidium guajava		1	+			0	1	1	0	50%
Sclerocarya birrea		2a	+			0	1	1	0	50%
Athrixia elata			+	+		0	0	1	1	50%
Barleria obtusa			+	+		0	0	1	1	50%
Cussonia natalensis			+	3		0	0	1	1	50%
Annona senegalensis	+	+		+		1	1	0	1	75%
Dichrostachys cinerea	1		2a	+		1	0	1	1	75%
Peltophorum africanum	+	+		+		1	1	0	1	75%
Rhus pyroides	+		+	+		1	0	1	1	75%
Dombeya rotundifolia	+	+	+	+		1	1	1	1	100%
Hyparrhenia hirta	1	2a	2a	1		1	1	1	1	100%
Pterocarpus angolensis	+	1	+	2a		1	1	1	1	100%
Number of species per plot and mean						22	14	26	39	25

## 14 APPENDIX E – GEOREFERENCE DIGITAL PHOTOS



## 15 APPENDIX F – LIST OF POTENTIAL MAMMALS

Family	Scientific name	Common name	Red list category
Bathyergidae	<i>Cryptomys hottentotus</i>	Southern African Mole-rat	Least Concern (2016)
Bovidae	<i>Alcelaphus buselaphus caama</i>	Red Hartebeest	Least Concern (2008)
Bovidae	<i>Cephalophus natalensis</i>	Red Duiker	Near Threatened (2016)
Bovidae	<i>Connochaetes gnou</i>	Black Wildebeest	Least Concern (2016)
Bovidae	<i>Damaliscus pygargus phillipsi</i>	Blesbok	Least Concern (2016)
Bovidae	<i>Kobus ellipsiprymnus</i>	Waterbuck	Least Concern (ver 3.1, 2016)
Bovidae	<i>Oreotragus oreotragus</i>	Klipspringer	Least Concern (2016)
Bovidae	<i>Ourebia ourebi</i>	Oribi	Endangered
Bovidae	<i>Pelea capreolus</i>	Vaal Rhebok	Near Threatened (2016)
Bovidae	<i>Raphicerus campestris</i>	Steenbok	Least Concern (2016)
Bovidae	<i>Redunca arundinum</i>	Southern Reedbuck	Least Concern (2016)
Bovidae	<i>Redunca fulvorufula</i>	Mountain Reedbuck	Least Concern
Bovidae	<i>Sylvicapra grimmia</i>	Bush Duiker	Least Concern (2016)
Bovidae	<i>Taurotragus oryx</i>	Common Eland	Least Concern (2016)
Bovidae	<i>Tragelaphus scriptus</i>	Bushbuck	Least Concern
Bovidae	<i>Tragelaphus strepsiceros</i>	Greater Kudu	Least Concern (2016)
Canidae	<i>Canis adustus</i>	Side-striped Jackal	Least Concern (2016)
Canidae	<i>Canis mesomelas</i>	Black-backed Jackal	Least Concern (2016)
Canidae	<i>Lycaon pictus</i>	African wild dog	Endangered (2016)
Canidae	<i>Vulpes chama</i>	Cape Fox	Least Concern (2016)
Cercopithecidae	<i>Cercopithecus albogularis</i>	Samango Monkey	Least Concern (2008)
Cercopithecidae	<i>Cercopithecus albogularis erythrarchus</i>	Samango Monkey (subsp. erythrarchus)	Near Threatened (2016)
Cercopithecidae	<i>Chlorocebus pygerythrus</i>	Vervet Monkey	Least Concern (2016)

Family	Scientific name	Common name	Red list category
Cercopithecidae	<i>Chlorocebus pygerythrus pygerythrus</i>	Vervet Monkey (subspecies pygerythrus)	Least Concern (2008)
Cercopithecidae	<i>Papio hamadryas</i>	Hamadryas Baboon	
Cercopithecidae	<i>Papio ursinus</i>	Chacma Baboon	Least Concern (2016)
Chrysochloridae	<i>Amblysomus robustus</i>	Robust Golden Mole	Vulnerable (2016)
Emballonuridae	<i>Taphozous (Taphozous) mauritanus</i>	Mauritian Tomb Bat	Least Concern
Equidae	<i>Equus caballus ferus</i>		Introduced
Equidae	<i>Equus quagga</i>	Plains Zebra	Least Concern (2016)
Erinaceidae	<i>Atelerix frontalis</i>	Southern African Hedgehog	Near Threatened (2016)
Felidae	<i>Caracal caracal</i>	Caracal	Least Concern (2016)
Felidae	<i>Felis catus</i>	Domestic Cat	Introduced
Felidae	<i>Felis silvestris</i>	Wildcat	Least Concern (2016)
Felidae	<i>Leptailurus serval</i>	Serval	Near Threatened (2016)
Felidae	<i>Panthera leo</i>	Lion	Least Concern (2016)
Felidae	<i>Panthera pardus</i>	Leopard	Vulnerable (2016)
Galagidae	<i>Otolemur crassicaudatus</i>	Brown Greater Galago	Least Concern (2016)
Gliridae	<i>Graphiurus (Graphiurus) kelleni</i>	Kellen's African Dormouse	
Gliridae	<i>Graphiurus (Graphiurus) murinus</i>	Forest African Dormouse	Least Concern
Herpestidae	<i>Atilax paludinosus</i>	Marsh Mongoose	Least Concern (2016)
Herpestidae	<i>Cynictis penicillata</i>	Yellow Mongoose	Least Concern (2016)
Herpestidae	<i>Helogale parvula</i>	Common Dwarf Mongoose	Least Concern (2016)
Herpestidae	<i>Herpestes sanguineus</i>	Slender Mongoose	Least Concern (2016)
Herpestidae	<i>Ichneumia albicauda</i>	White-tailed Mongoose	Least Concern (2016)
Herpestidae	<i>Mungos mungo</i>	Banded Mongoose	Least Concern (2016)
Herpestidae	<i>Rhynchogale melleri</i>	Meller's Mongoose	Least Concern (2016)
Herpestidae	<i>Suricata suricatta</i>	Meerkat	Least Concern (2016)
Hippopotamidae	<i>Hippopotamus amphibius</i>	Common Hippopotamus	Least Concern (2016)
Hipposideridae	<i>Cloeotis percivali</i>	Percival's Short-eared Trident Bat	Endangered (2016)

Family	Scientific name	Common name	Red list category
Hipposideridae	Hipposideros caffer	Sundevall's Leaf-nosed Bat	Least Concern (2016)
Hyaenidae	Hyaena brunnea	Brown Hyena	Near Threatened (2015)
Hyaenidae	Proteles cristata	Aardwolf	Least Concern (2016)
Hystricidae	Hystrix africaeaustralis	Cape Porcupine	Least Concern
Leporidae	Lepus capensis	Cape Hare	Least Concern
Leporidae	Lepus saxatilis	Scrub Hare	Least Concern
Leporidae	Pronolagus rupestris	Smith's Red Rock Hare	Least Concern (2016)
Molossidae	Chaerephon pumilus	Little Free-tailed Bat	Least Concern (2016)
Molossidae	Mops (Mops) condylurus	Angolan Free-tailed Bat	Least Concern
Molossidae	Tadarida aegyptiaca	Egyptian Free-tailed Bat	Least Concern (2016)
Muridae	Acomys sp.	Spiny Mice	
Muridae	Aethomys sp.	Veld rats	
Muridae	Aethomys ineptus	Tete Veld Aethomys	Least Concern (2016)
Muridae	Aethomys namaquensis	Namaqua Rock Mouse	Least Concern
Muridae	Gerbilliscus brantsii	Highveld Gerbil	Least Concern (2016)
Muridae	Grammomys dolichurus	Common Grammomys	Least Concern (2016)
Muridae	Lemniscomys sp.	Grass Mice	
Muridae	Lemniscomys rosalia	Single-Striped Lemniscomys	Least Concern (2016)
Muridae	Mastomys sp.	Multimammate Mice	
Muridae	Mastomys coucha	Southern African Mastomys	Least Concern (2016)
Muridae	Mastomys natalensis	Natal Mastomys	Least Concern (2016)
Muridae	Mus (Nannomys) minutoides	Southern African Pygmy Mouse	Least Concern
Muridae	Mus musculus musculus		Least concern
Muridae	Otomys sp.	Vlei Rats	
Muridae	Otomys angoniensis	Angoni Vlei Rat	Least Concern (2016)
Muridae	Otomys auratus	Southern African Vlei Rat	Near Threatened (2016)
Muridae	Rattus sp.	Genus Rattus	

Family	Scientific name	Common name	Red list category
Muridae	<i>Rattus rattus</i>	Roof Rat	Least Concern
Muridae	<i>Rhabdomys pumilio</i>	Xeric Four-striped Grass Rat	Least Concern (2016)
Mustelidae	<i>Aonyx capensis</i>	African Clawless Otter	Near Threatened (2016)
Mustelidae	<i>Hydricis maculicollis</i>	Spotted-necked Otter	Least Concern (IUCN 2008)
Mustelidae	<i>Ictonyx striatus</i>	Striped Polecat	Least Concern (2016)
Mustelidae	<i>Mellivora capensis</i>	Honey Badger	Least Concern (2016)
Mustelidae	<i>Poecilogale albinucha</i>	African Striped Weasel	Near Threatened (2016)
Nesomyidae	<i>Dendromus melanotis</i>	Gray African Climbing Mouse	Least Concern (2016)
Nesomyidae	<i>Dendromus mystacalis</i>	Chestnut African Climbing Mouse	Least Concern (2016)
Nesomyidae	<i>Saccostomus campestris</i>	Southern African Pouched Mouse	Least Concern (2016)
Nycteridae	<i>Nycteris thebaica</i>	Egyptian Slit-faced Bat	Least Concern (2016)
Orycteropodidae	<i>Orycteropus afer</i>	Aardvark	Least Concern (2016)
Procaviidae	<i>Procavia capensis</i>	Cape Rock Hyrax	Least Concern (2016)
Pteropodidae	<i>Epomophorus</i> sp.	Epauletted Fruit Bats	
Pteropodidae	<i>Epomophorus wahlbergi</i>	<i>Epomophorus wahlbergi</i>	Least Concern (2016)
Pteropodidae	<i>Rousettus (Rousettus) aegyptiacus</i>	Egyptian Rousette	Least Concern
Rhinolophidae	<i>Rhinolophus</i> sp.	Horseshoe Bats	
Rhinolophidae	<i>Rhinolophus blasii</i>	Blasius's Horseshoe Bat	Near Threatened (2016)
Rhinolophidae	<i>Rhinolophus clivus</i>	Geoffroy's Horseshoe Bat	Least Concern (2016)
Rhinolophidae	<i>Rhinolophus cohenae</i>	Cohen's Horseshoe Bat	Vulnerable (2016)
Rhinolophidae	<i>Rhinolophus darlingi</i>	Darling's Horseshoe Bat	Least Concern (2016)
Rhinolophidae	<i>Rhinolophus hildebrandtii</i>	Hildebrandt's Horseshoe Bat	Near Threatened
Rhinolophidae	<i>Rhinolophus simulator</i>	Bushveld Horseshoe Bat	Least Concern (2016)
Rhinolophidae	<i>Rhinolophus swinnyi</i>	Swinny's Horseshoe Bat	Vulnerable (2016)
Soricidae	<i>Crocidura</i> sp.	Shrews	
Soricidae	<i>Crocidura cyanea</i>	Reddish-gray Musk Shrew	Least Concern (2016)
Soricidae	<i>Crocidura flavescens</i>	Greater Red Musk Shrew	Least Concern (2016)

Family	Scientific name	Common name	Red list category
Soricidae	<i>Crocidura hirta</i>	Lesser Red Musk Shrew	Least Concern (2016)
Soricidae	<i>Crocidura maquassiensis</i>	Makwassie Musk Shrew	Vulnerable (2016)
Soricidae	<i>Crocidura mariquensis</i>	Swamp Musk Shrew	Near Threatened (2016)
Soricidae	<i>Crocidura silacea</i>	Lesser Gray-brown Musk Shrew	Least Concern (2016)
Soricidae	<i>Myosorex</i> sp.	Mouse Shrews	
Soricidae	<i>Myosorex cafer</i>	Dark-footed Mouse Shrew	Vulnerable (2016)
Soricidae	<i>Myosorex varius</i>	Forest Shrew	Least Concern (2016)
Soricidae	<i>Suncus infinitesimus</i>	Least Dwarf Shrew	Least Concern (2016)
Soricidae	<i>Suncus varilla</i>	Lesser Dwarf Shrew	Least Concern (2016)
Suidae	<i>Potamochoerus larvatus</i>	Bush-pig	Least Concern (2016)
Suidae	<i>Potamochoerus larvatus koiropotamus</i>	Bush-pig (subspecies koiropotamus)	Least Concern (2016)
Suidae	<i>Potamochoerus porcus</i>	Red River Hog	
Vespertilionidae	<i>Eptesicus (Eptesicus) hottentotus</i>	Long-tailed Serotine	Least Concern
Vespertilionidae	<i>Kerivoula lanosa</i>	Lesser Woolly Bat	Least Concern (2016)
Vespertilionidae	<i>Miniopterus</i> sp.	Long-fingered Bats	
Vespertilionidae	<i>Miniopterus fraterculus</i>	Lesser Long-fingered Bat	Least Concern (2016)
Vespertilionidae	<i>Miniopterus natalensis</i>	Natal Long-fingered Bat	Least Concern (2016)
Vespertilionidae	<i>Miniopterus schreibersii</i>	Schreibers's Long-fingered Bat	Near Threatened
Vespertilionidae	<i>Myotis</i> sp.	Myotis (Mouse-eared Bats, Hairy Bats)	
Vespertilionidae	<i>Myotis tricolor</i>	Temminck's Myotis	Least Concern (2016)
Vespertilionidae	<i>Neoromicia</i> sp.		
Vespertilionidae	<i>Neoromicia capensis</i>	Cape Serotine	Least Concern (2016)
Vespertilionidae	<i>Neoromicia nana</i>	Banana Pipistrelle	Least Concern
Vespertilionidae	<i>Pipistrellus</i> sp.	Pipistrelles	
Vespertilionidae	<i>Pipistrellus (Pipistrellus) hesperidus</i>	Dusky Pipistrelle	Least Concern
Vespertilionidae	<i>Scotophilus dinganii</i>	Yellow-bellied House Bat	Least Concern (2016)
Viveridae	<i>Genetta maculata</i>	Common Large-spotted Genet	Least Concern



<b>Family</b>	<b>Scientific name</b>	<b>Common name</b>	<b>Red list category</b>
Viverridae	<i>Civettictis civetta</i>	African Civet	Least Concern (2016)
Viverridae	<i>Genetta</i> sp.	Genets	
Viverridae	<i>Genetta maculata</i>	Rusty-spotted Genet (Common Large-spotted Genet)	Least Concern (2016)
Viverridae	<i>Genetta tigrina</i>	Cape Genet (Cape Large-spotted Genet)	Least Concern (2016)

## 16 APPENDIX G – LIST OF POTENTIAL REPTILES

Family	Scientific name	Common name	Red list category
Agamidae	<i>Acanthocercus atricollis</i>	Southern Tree Agama	Least Concern (SARCA 2014)
Agamidae	<i>Agama aculeata distanti</i>	Distant's Ground Agama	Least Concern (SARCA 2014)
Chamaeleonidae	<i>Bradypodion transvaalense</i>	Wolkberg Dwarf Chameleon	Least Concern (SARCA 2014)
Colubridae	<i>Crotaphopeltis hotamboeia</i>	Red-lipped Snake	Least Concern (SARCA 2014)
Colubridae	<i>Dasypeltis inornata</i>	Southern Brown Egg-eater	Least Concern (SARCA 2014)
Colubridae	<i>Dispholidus typus viridis</i>	Northern Boomslang	Not evaluated
Colubridae	<i>Philothamnus semivariegatus</i>	Spotted Bush Snake	Least Concern (SARCA 2014)
Colubridae	<i>Thelotornis capensis capensis</i>	Southern Twig Snake	Least Concern (SARCA 2014)
Cordylidae	<i>Cordylus vittifer</i>	Common Girdled Lizard	Least Concern (SARCA 2014)
Cordylidae	<i>Platysaurus intermedius wilhelmi</i>	Wilhelm's Flat Lizard	Least Concern (SARCA 2014)
Cordylidae	<i>Pseudocordylus melanotus melanotus</i>	Common Crag Lizard	Least Concern (SARCA 2014)
Elapidae	<i>Dendroaspis polylepis</i>	Black Mamba	Least Concern (SARCA 2014)
Elapidae	<i>Naja mossambica</i>	Mozambique Spitting Cobra	Least Concern (SARCA 2014)
Gekkonidae	<i>Homopholis wahlbergii</i>	Wahlberg's Velvet Gecko	Least Concern (SARCA 2014)
Gekkonidae	<i>Lygodactylus capensis capensis</i>	Common Dwarf Gecko	Least Concern (SARCA 2014)
Gekkonidae	<i>Lygodactylus ocellatus</i>	Spotted Dwarf Gecko	Least Concern (SARCA 2014)
Gekkonidae	<i>Pachydactylus vansoni</i>	Van Son's Gecko	Least Concern (SARCA 2014)
Gerrhosauridae	<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated Lizard	Least Concern (SARCA 2014)
Lacertidae	<i>Nucras ornata</i>	Ornate Sandveld Lizard	Least Concern (SARCA 2014)
Lamprophiidae	<i>Aparallactus capensis</i>	Black-headed Centipede-eater	Least Concern (SARCA 2014)
Lamprophiidae	<i>Boaedon capensis</i>	Brown House Snake	Least Concern (SARCA 2014)
Lamprophiidae	<i>Lycophidion capense capense</i>	Cape Wolf Snake	Least Concern (SARCA 2014)
Lamprophiidae	<i>Psammophis brevirostris</i>	Short-snouted Grass Snake	Least Concern (SARCA 2014)
Lamprophiidae	<i>Psammophis crucifer</i>	Cross-marked Grass Snake	Least Concern (SARCA 2014)

Family	Scientific name	Common name	Red list category
Lamprophiidae	Psammophylax rhombeatus	Spotted Grass Snake	Least Concern (SARCA 2014)
Lamprophiidae	Pseudaspis cana	Mole Snake	Least Concern (SARCA 2014)
Leptotyphlopidae	Leptotyphlops sp.		
Leptotyphlopidae	Leptotyphlops jacobseni	Jacobsen's Thread Snake	Least Concern (SARCA 2014)
Pythonidae	Python natalensis	Southern African Python	Least Concern (SARCA 2014)
Scincidae	Acontias plumbeus	Giant Legless Skink	Least Concern (SARCA 2014)
Scincidae	Mochlus sundevallii	Sundevall's Writhing Skink	Least Concern (SARCA 2014)
Scincidae	Panaspis wahlbergi	Wahlberg's Snake-eyed Skink	Least Concern (SARCA 2014)
Scincidae	Scelotes mirus	Montane Dwarf Burrowing Skink	Least Concern (SARCA 2014)
Scincidae	Trachylepis margaritifera	Rainbow Skink	Least Concern (SARCA 2014)
Scincidae	Trachylepis punctatissima	Speckled Rock Skink	Least Concern (SARCA 2014)
Scincidae	Trachylepis striata	Striped Skink	Least Concern (SARCA 2014)
Scincidae	Trachylepis varia sensu lato	Common Variable Skink Complex	Least Concern (SARCA 2014)
Typhlopidae	Afrotyphlops bibronii	Bibron's Blind Snake	Least Concern (SARCA 2014)
Typhlopidae	Rhinotyphlops lalandei	Delalande's Beaked Blind Snake	Least Concern (SARCA 2014)
Viperidae	Bitis arietans arietans	Puff Adder	Least Concern (SARCA 2014)
Viperidae	Causus rhombeatus	Rhombic Night Adder	Least Concern (SARCA 2014)