

BASIC ASSESSMENT REPORT FOR CELLPHONE MAST ON PORTION 1 OF HOEKPLAATS 384, “ROOIHUISKRAAL 56”, GAUTENG PROVINCE



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Specialist report for Lokisa
Environmental Consulting CC



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Basic assessment report for cellphone mast on portion 57 of Doornrandje 386, “Rooihuiskraal 3”, Gauteng province

SPECIALIST REPORT FOR LOKISA ENVIRONMENTAL CONSULTING CC

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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. The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information at the time of study. Therefore, the author reserves the right to modify aspects of the report including the recommendations if and when new information may become available from ongoing research or further work in this field, or pertaining to this investigation.

Although the author exercises due care and diligence in rendering services and preparing documents, he accepts no liability, and the client, by receiving this document, indemnifies the author against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by the author and by the use of this document.

The Environmental Impact Assessment Regulations (Regulation 17 of Government Notice No. R345 of 2010), requires that certain information is included in specialist reports. The terms of reference, purpose of the report, methodologies, assumptions and limitations, impact assessment and mitigation (where relevant to the scope of work) and summaries of consultations (where applicable) are included within the main report. Other relevant information is set out below:

Expertise of authors

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Declaration of independence:

Themeda Eco Consulting is an independent consultant and hereby declare that neither it nor its associates have any financial or other vested interest in the undertaking of the proposed activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998). In addition, remuneration for services provided by Themeda Eco Consulting is not subjected to or based on approval of the proposed project by the relevant authorities responsible for authorising this proposed project.

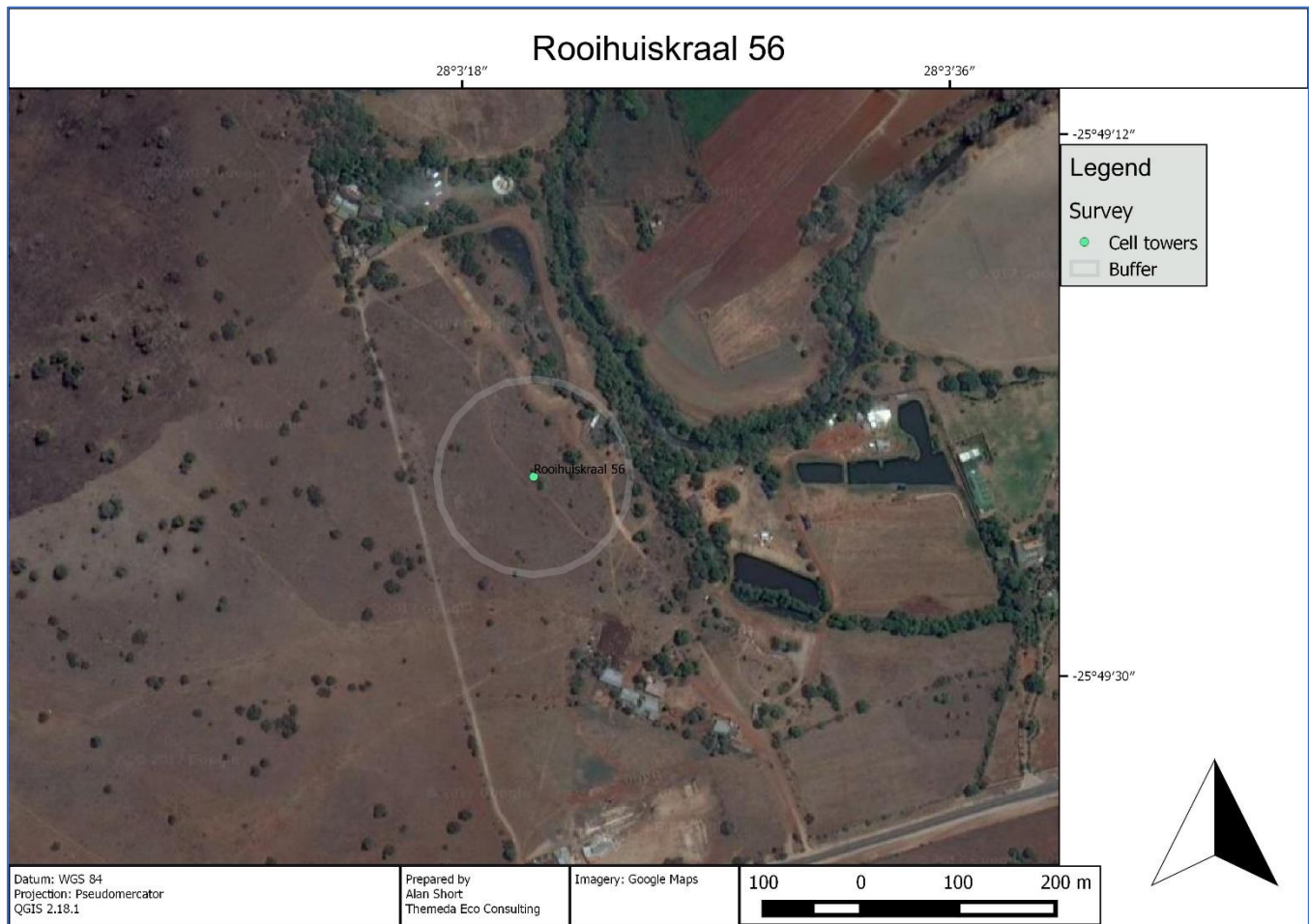
Disclosure

Themeda Eco Consulting undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and will provide the competent authority with access to all information at its disposal regarding the application, whether such information is favourable to the applicant or not.

Based on information provided to Themeda Eco Consulting by the client, and in addition to information obtained during the course of this study, Themeda Eco Consulting present the results and conclusion within the associated document to the best of the authors professional judgement and in accordance with best practise.

1 INTRODUCTION

A cell phone mast is proposed for portion 1 of the farm Hoekplaats 384, City of Tshwane, Gauteng. The footprint of the proposal is ~100m², located in the corner of a rural property, just north of the M26 (Map 1). The proposed site is located along a small farm track (called the "secondary track" in this report), which diverts off a main dirt road.



Map 1: Location of the study site. The M26 runs through the bottom right-hand corner of the image. The "main dirt road" cuts through the upper right of the circle, parallel to the Hennops river. The "Secondary track" on which the proposed tower is located can be seen bisecting the circle around the proposed mast.

1.1 Terms of reference

The terms of reference were to:

1. Conduct a Basic Assessment of the faunal habitats and flora of the site according to the NEMA act and regulations, and following GDARD guidelines

2. Assess the impact of the proposed development on the structure and functioning of the ecosystem, with particular reference to fauna and flora.

1.2 Assumptions and limitations

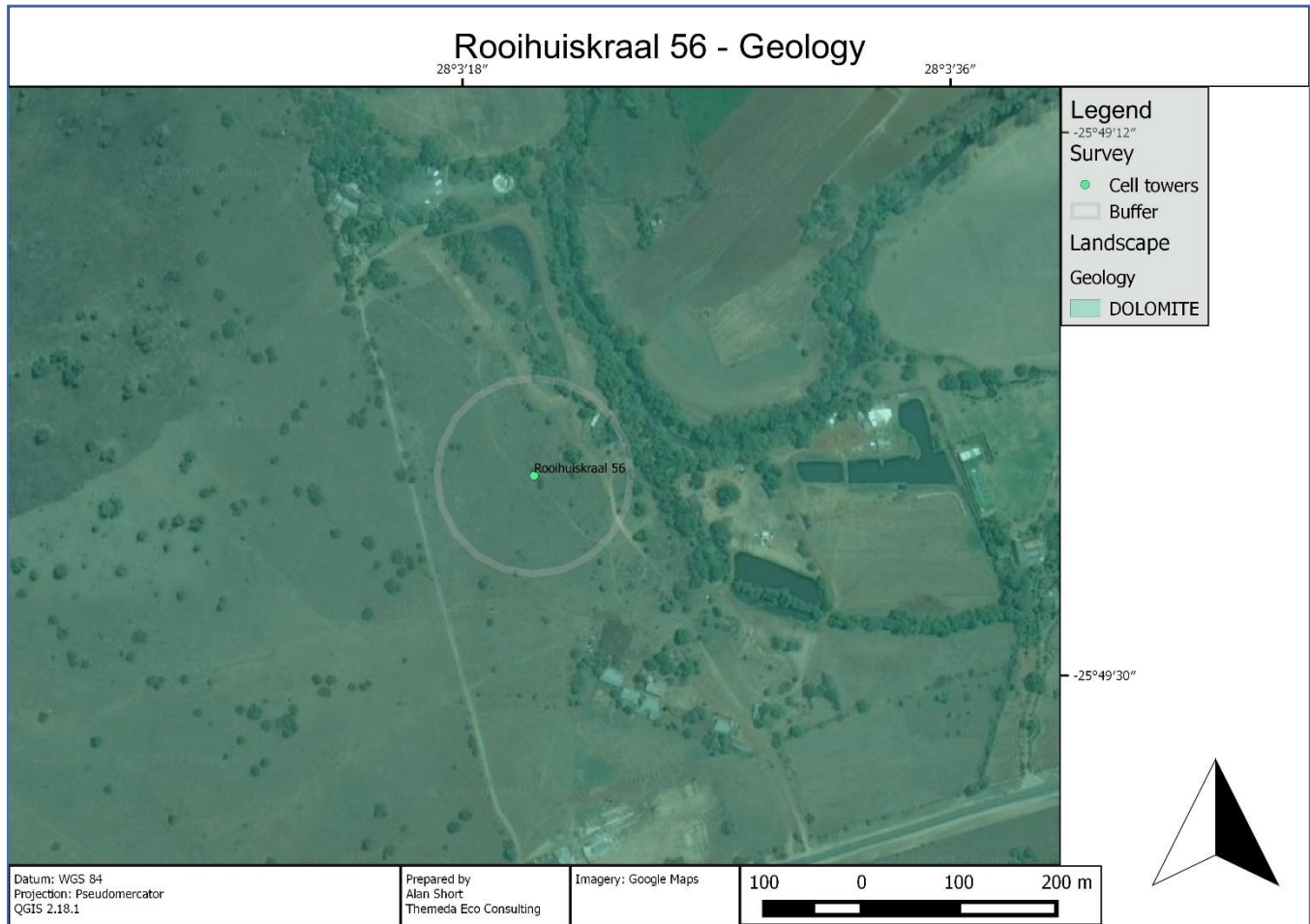
1. No alternative site was provided by the client; alternatives for the development site can therefore NOT be evaluated and compared;
2. The site visit was conducted at the end of the dry season, and very few species were flowering, making species identification difficult and significantly increasing the likelihood that many species occurring on site were not recorded.

2 DESCRIPTION OF ACTIVITY AND STUDY SITE

2.1 Proposed activity

A 35m tall cell phone mast is proposed for the site, surrounded by a palisade fence. The development falls under Listing Notice 3 (b) (v) of the Environmental Impact Assessment Regulations under the National Environmental Management Act (Act 107 of 1998, as amended).

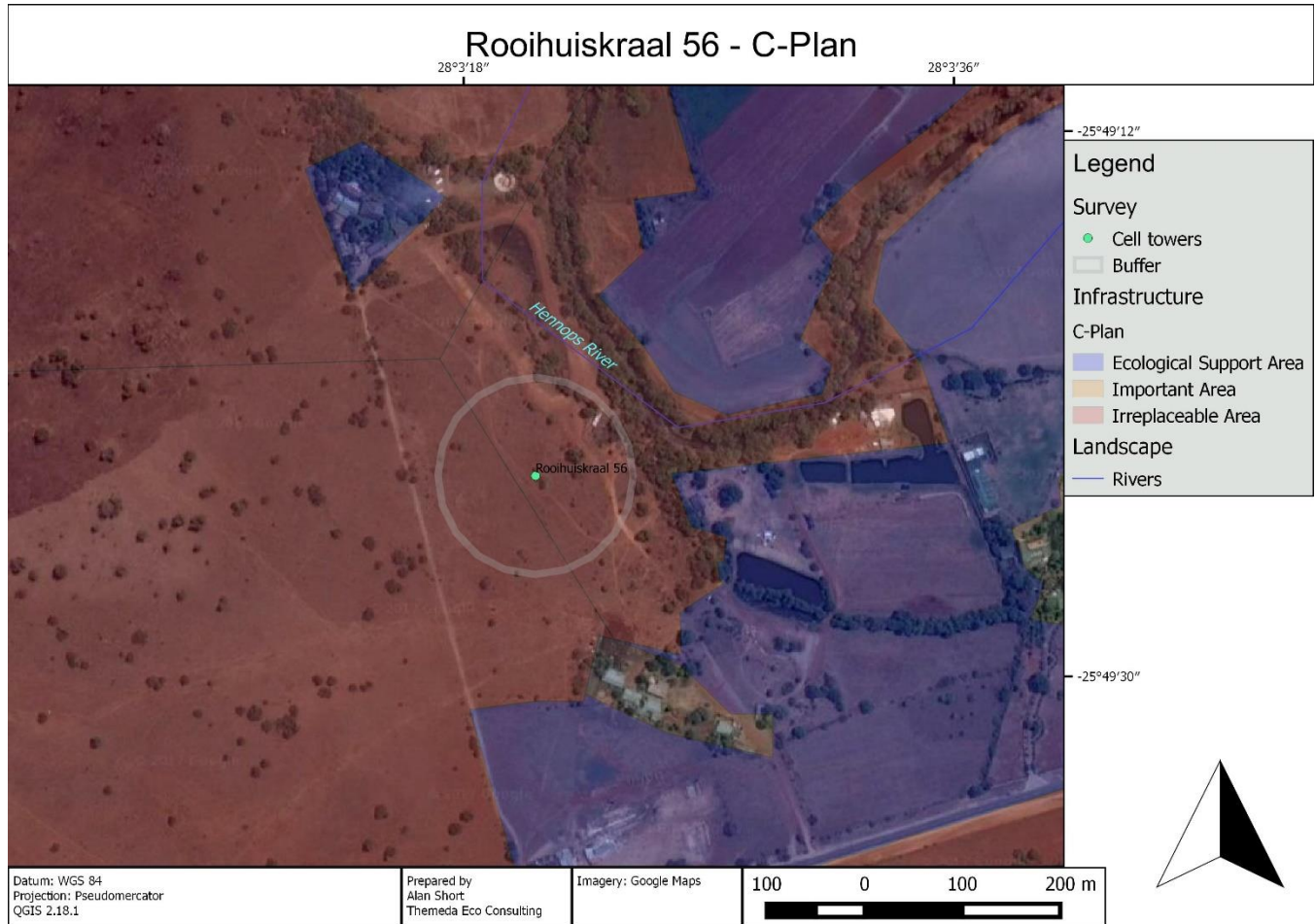
2.2 Geology, topography and climate



Map 2: Geology of the study site

The site is situated on a gentle east-facing slope, at 1370m above sea level. The geology is predominantly dolomite (Map 2). Mean rainfall is approximately 593mm per annum, falling mostly in the summer months. Occasional frosts occur in winter. The soils are shallow and rocky, with dolomite outcrops visible across the site and the buffer zone, some of which support clumps of diverse woody species.

2.3 Vegetation and conservation status



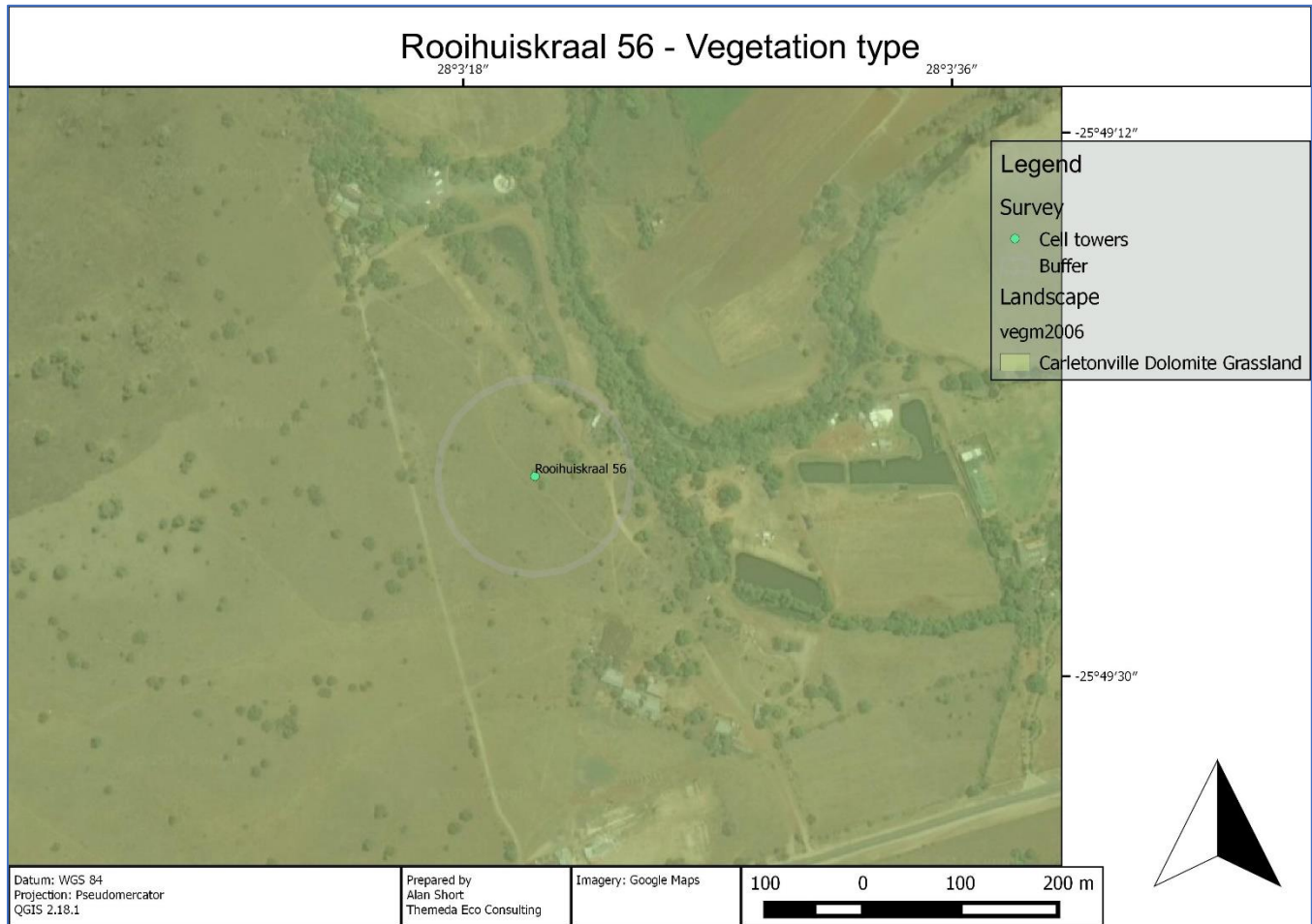
Map 3: Conservation value of the study area

According to the Gauteng Conservation Plan (C-Plan) V 3.3 (GDARD 2011), the site falls into a Critical Biodiversity Area: Irreplaceable Area (Map 3). The vegetation of the surrounding area is classified under as Carletonville Dolomite Grassland (Map 4) (Mucina and Rutherford 2006). The study site falls under the Vulnerable Witwatersberg Pretoria Mountain Bushveld on the National list of threatened Ecosystems (Map 5) (SANBI and DEAT 2009).

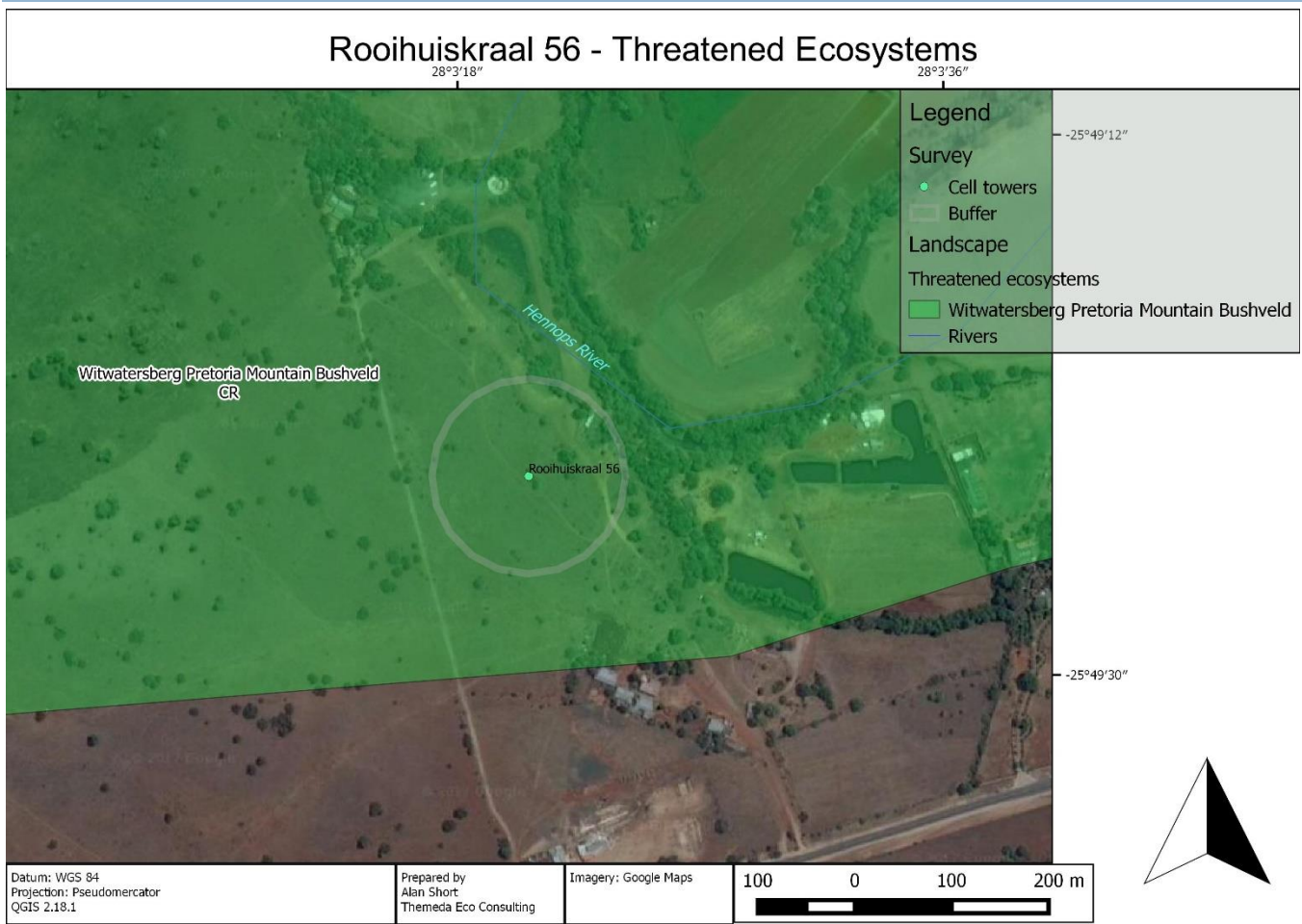
A portion of the surveyed area around the mast site overlaps with the 100m buffer of the Hennops River (Map 6). However, the site itself falls outside of the riparian buffer. A formal wetland assessment was not conducted.

The vegetation (described in more detail under results) was typical of the Carletonville Dolomite grasslands and surround vegetation types. This grassland type is characterised as a rocky grassland with *Searsia lancea* trees scattered, especially amongst rocky outcrops, and a herbaceous layer of grasses

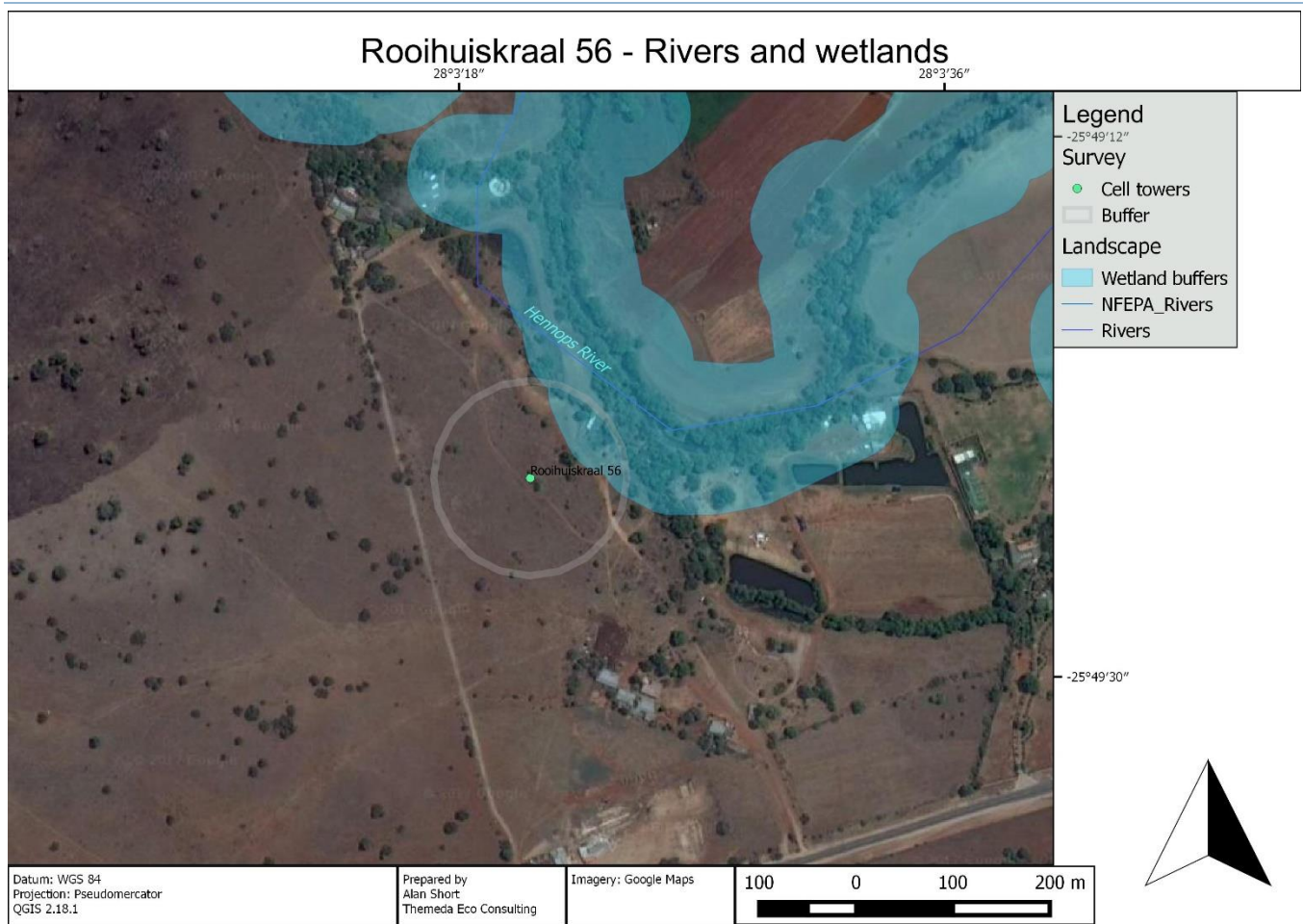
and forbs. Good condition Carletonville Dolomite Grassland would be expected to be dominated by *Themeda triandra*, *Heteropogon contortus*, *Eragrostis* spp., *Diheteropogon amplexens*, *Seteria sphacelata* and other grasses, with a high diversity of forbs. The grassland has been transformed in places to urban and exurban development as well as some cultivation on the deeper soils, but large extents of relatively untransformed grassland are still extant in the surrounding areas. Rocky outcrops protect smaller shrubs such as *Searsia magalismontanum* and *Euclea undulata* from fire. The area was characterised by shallow soils with scattered bush clumps in a grassy matrix.



Map 4: Vegetation type of the study area



Map 5: Threatened ecosystems of the study area



Map 6: Rivers and wetlands of the study area.

3 METHODS

A field survey was conducted on 12 October 2017. The location of the proposed cell mast was closely searched for species of conservation concern, and a species list of all plant species observed was recorded. A description of the site and habitat condition was recorded, aided by photos. The veld around the site, within the property, was also surveyed and a plant species list and habitat description recorded.

All relevant spatial data, including provincial and national conservation, biodiversity, water and vegetation data was examined to determine the conservation status of the area. Recent aerial imagery from Google Earth was examined for further information.

Relevant literature was consulted for the area, as well as relevant biodiversity databases to compile lists of species likely to occur on site.

4 VEGETATION SURVEY RESULTS

The proposed cell mast site falls in between two bush clumps, consisting of a mixture of *Celtis africana*, *Gymnosporia buxifolia*, *Searsia pyroides*, *S. lancea*, *Grewia flava*, *Asparagus laricinus* and the invasive *Melia azedarach* (syringa). The herbaceous layer was a species-rich mixture of grasses and forbs, dominated by *Hyparrhenia hirta*, *Themeda triandra*, *Eragrostis rigidior*, *E. curvula*, *Microchloa caffra*, *Digitaria eriantha*, *Hypoxis hemerocallidea*, *Aloe greatheadii*, *Gomphocarpus fruticosus*, and *Hermannia* spp. The invasive *Verbena bonariensis* was scattered around the site.

The site was in good condition, with a diverse plant community typical of Carletonville Dolomite Grassland. The soils are shallow, with rocky patches which allowed bush clumps to form.

Further afield from the site, there were fewer bush clumps. The grass layer was similar to that described above, with the addition of *Hilliardiella* (formerly *Vernonia*) *oligocephala*, *Commelina africana*, *Cucumis zeyheri*, *Indigofera hedyantha*, and others.



Map 7: Survey area for the Rooihuiskraal 56 Cell Mast. The white lines show the track followed by the surveyors. The grey circle is the 100m buffer around the mast location. Image: Google Earth



Photo 1: Top: Photograph of the study site, looking south-west. The proposed location of the mast is indicated by the arrow, falling between two bush clumps. Bottom: Google Earth view of mast site. Note the bush clumps on either side of the proposed location

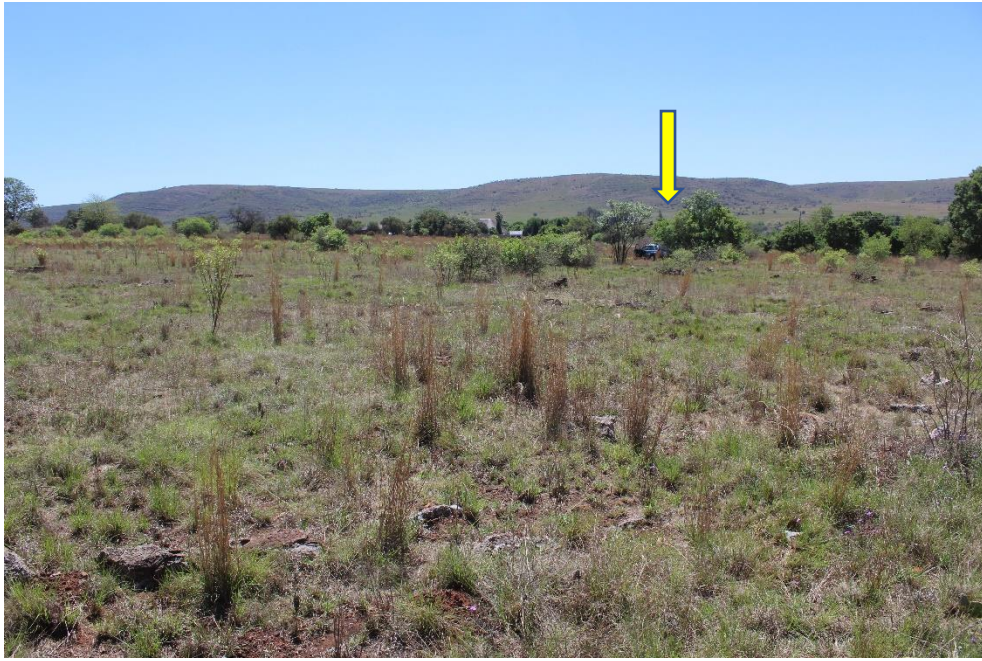


Photo 2: Photo taken from the south of the study area, looking towards the cell mast site. The approximate location of the mast is indicated by the arrow



Photo 3: Patches of *Hyparrhenia hirta* in rocky grassland



Photo 4: Near the northern part of the site, adjacent to the main dirt road, looking north. Note the patch of *Opuntia* in the middle distance.



Photo 5: South of the cell mast site, looking west. Farm buildings in the background.

The northern part of the site, near the main dirt road, was more degraded, with weedy species and patches of *Opuntia* (jointed cactus).

Several provincially-protected plants, including *Crinum graminicola* and *Brachystelma* were recorded around the site.

Table 1: Species composition of the immediate cell mast site and the adjacent veld. Species highlighted in orange are provincially threatened or protected species (discussed further below)

Family	Species	Redlist/Invasive category	Cell mast location	Adjacent veld
Acanthaceae	<i>Crabbea angustifolia</i>	LC- Least concern	1	
Amaryllidaceae	<i>Crinum graminicola</i>	LC- Least concern		1
Anacardiaceae	<i>Searsia pyroides</i>	LC- Least concern	1	
Apocynaceae	<i>Brachystelma barberae</i>	LC- Least concern		1
	<i>Gomphocarpus fruticosus</i>	LC- Least concern	1	1
	<i>Pentarrhinum abyssinicum</i>	LC- Least concern		1
Asparagaceae	<i>Asparagus laricinus</i>	LC- Least concern	1	
Asphodelaceae	<i>Aloe greatheadii</i>	LC- Least concern	1	1
	<i>Bulbine capitata</i>	LC- Least concern		1
Asteraceae	<i>Felicia filifolia</i>	LC- Least concern		1
	<i>Felicia muricata</i>	LC- Least concern	1	
	<i>Helichrysum nudifolium</i>	LC- Least concern		1
	<i>Hilliardiella oligocephala</i>	LC- Least concern		1
	<i>Osteospermum muricatum</i>	LC- Least concern		1
Celastraceae	<i>Gymnosporia buxifolia</i>	LC- Least concern	1	
Chrysobalanaceae	<i>Parinari capensis</i>	LC- Least concern		1
Commelinaceae	<i>Commelina africana</i>	LC- Least concern		1
Cucurbitaceae	<i>Cucumis zeyheri</i>	LC- Least concern		1
Fabaceae	<i>Indigofera hedyantha</i>	LC- Least concern		1
Geraniaceae	<i>Pelargonium luridum</i>	LC- Least concern	1	
Hyacinthaceae	<i>Albuca glauca</i>	LC- Least concern	1	
	<i>Ledebouria asperifolia</i>	LC- Least concern	1	
Hypoxidaceae	<i>Hypoxis hemerocallidea</i>	LC- Least concern	1	
Malvaceae	<i>Corchorus confusus</i>	LC- Least concern		1
	<i>Grewia flava</i>	LC- Least concern	1	
	<i>Hermannia depressa</i>	LC- Least concern	1	
	<i>Hermannia transvaalensis</i>	LC- Least concern	1	
Poaceae	<i>Aristida congesta congesta</i>	LC- Least concern		1
	<i>Eragrostis capensis</i>	LC- Least concern	1	1
	<i>Eragrostis curvula</i>	LC- Least concern	1	1
	<i>Eragrostis lehmanniana</i>	LC- Least concern		1
	<i>Eragrostis rigidior</i>	LC- Least concern	1	1
	<i>Eragrostis superba</i>	LC- Least concern	1	1
	<i>Hyparrhenia hirta</i>	LC- Least concern	1	1
	<i>Microchloa caffra</i>	LC- Least concern	1	1
	<i>Melanis nerviglumis</i>	LC- Least concern	1	1
	<i>Setaria sphacelata</i>	LC- Least concern	1	1
	<i>Triaraphis andropogonoides</i>	LC- Least concern	1	1
	<i>Themeda triandra</i>	LC- Least concern	1	1
		LC for species except <i>C. deltoides</i> subs.		
Pteridaceae	<i>Cheilanthes</i> sp.	<i>silicicola</i> (VU)		1

Family	Species	Redlist/Invasive category	Cell mast location	Adjacent veld
Santalaceae	<i>Thesium utile</i>	LC- Least concern	1	
Ulmaceae	<i>Celtis africana</i>	LC- Least concern	1	
Velloziaceae	<i>Xerophyta retinervis</i>	LC- Least concern		1
Cactaceae	* <i>Opuntia</i> sp.	Category 1	1	1
Meliaceae	* <i>Melia azedarach</i>	Category 1	1	
Verbenaceae	* <i>Verbena bonariensis</i>	Category 1	1	
	* <i>Verbena tenuisecta</i>	Not classified	1	
Agavaceae	* <i>Agave americana</i>	Not classified		1

*Exotic

5 PLANTS OF CONSERVATION CONCERN

Species are classified according to their risk of extinction, taking into account all available information on the species abundance, population trends, endemism and other factors. South Africa uses the IUCN framework for classifying species, as shown below. Threatened or protected species are listed in the South African Red data species list (Raimondo et al. 2009). A plant species list for the surrounding area was generated from the Plants of South Africa Database (<http://newposa.sanbi.org/sanbi/Explore>; accessed 13 September 2017), and cross-referenced with the list of threatened or protected species known to occur in Gauteng.

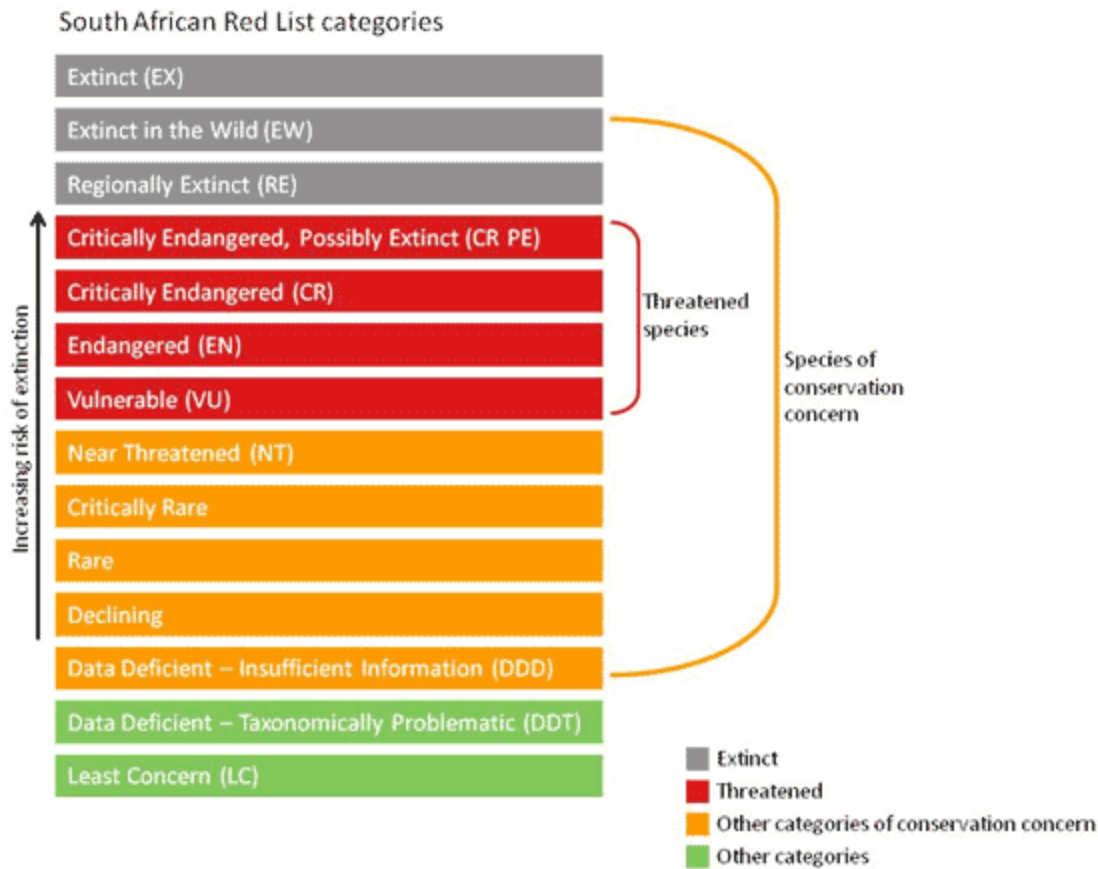


Figure 1: Classification of threatened or protected species (from <http://redlist.sanbi.org/redcat.php> [accessed 23 November 2015])

5.1 Nationally protected plants

The list of nationally-protected plants that may occur in the environment is shown in Table 2. The table was compiled by searching for threatened species in Carletonville Dolomite Grassland, as well as Gauteng province. The search was conducted on the SANBI redlist database (redlist.sanbi.org, accessed 30 October 2017). Species with incompatible habitats or ranges were removed from the list.

Table 2: List of nationally-protected plant species that could occur in the environment

SPECIES	FLOWERING SEASON	SUITABLE HABITAT	PRIORITY GROUP	CONSERVATION STATUS	
				(¹ global status; ² national status); ³ Listed as species of concern by GDARD	
<i>Adromischus umbraticola</i> subsp. <i>umbraticola</i>	September-January	Rock crevices on rocky ridges, usually south-facing, or in shallow gravel on top of rocks, but often in shade of other vegetation.	A2	Near Threatened ¹	Recorded within 5km of site. Low probability
<i>Argyrobium campicola</i>	November-February	Highveld grassland.	A3	Near Threatened ¹	Suitable habitat
<i>Boophone disticha</i>	October-January	Dry grassland and rocky areas.	N/A	Least concern ³	Recorded in the QDS. Suitable habitat
<i>Bowiea volubilis</i> subsp. <i>volubilis</i>	September-April	Shady places, steep rocky slopes and in open woodland, under large boulders in bush or low forest.	B	Vulnerable ²	Recorded in QDS. Little suitable habitat
<i>Brachycorythis conica</i> subsp. <i>transvaalensis</i>	January-March	Short grasslands, hillsides, on sandy gravel overlying dolomite, sometimes also on quartzites; occasionally open woodland; 1000 - 1705m.	A1	Critically Endangered ²	Recorded in QDS. Suitable habitat
<i>Callilepis leptophylla</i>	August-January & May	Grassland or open woodland, often on rocky outcrops or rocky hillslopes.	N/A	Least Concern ³	Recorded in QDS. Suitable habitat
<i>Ceropegia decidua</i> subsp. <i>pretoriensis</i>	November-April	Direct sunshine or shaded situations, rocky outcrops of the quartzitic Magaliesberg mountain series, in pockets of soil among rocks, in shade of shrubs and low trees, can be seen twining around grass spikes.	A1	Vulnerable ¹	Recorded in QDS but little suitable habitat
<i>Cheilanthes deltoidea</i> subsp. <i>silicicola</i>	November-June	Southwest-facing soil pockets and rock crevices in chert rock.	A2	Vulnerable ¹	Recorded in QDS but little suitable habitat
<i>Cleome conrathii</i>	March-May; December-January	Stony quartzite slopes, usually in red sandy soil, grassland or open to closed deciduous woodland, all aspects.	A3	Near Threatened ¹	Recorded within 5km but unsuitable habitat

SPECIES	FLOWERING SEASON	SUITABLE HABITAT	PRIORITY GROUP	CONSERVATION STATUS	
				(¹ global status; ² national status); ³ Listed as species of concern by GDARD	
<i>Crinum macowanii</i>	October-January	Grassland, along rivers, in gravelly soil or on sandy flats.	N/A	Least Concern ³	Recorded within 5km but little suitable habitat
<i>Dicliptera magaliesbergensis</i>	February-April	Forest, savanna (Riverine forest and bush).	A1	Vulnerable ¹	Recorded within 5km but little suitable habitat
<i>Drimia sanguinea</i>	August-December	Open veld and scrubby woodland in a variety of soil types.	B	Near Threatened ²	Recorded within 5km. Suitable habitat
<i>Eucomis autumnalis</i>	November-April	Damp, open grassland and sheltered places.	N/A	Least Concern ³	Recorded in QDS Suitable habitat
<i>Gunnera perpensa</i>	October-March	In cold or cool, continually moist localities, mainly along upland streambanks.	N/A	Least Concern ³	Recorded in QDS but little suitable habitat
<i>Habenaria kraenzliniana</i>	February-April	Terrestrial in stony, grassy hillsides, recorded from 1000 to 1400m.	A3	Near Threatened ¹	Recorded within 5km. Suitable habitat
<i>Habenaria mossii</i>	March-April	Open grassland on dolomite or in black sandy soil.	A1	Endangered ¹	Recorded in QDS. Suitable habitat
<i>Holothrix randii</i>	September-October	Grassy slopes and rock ledges, usually southern aspects.	B	Near Threatened ²	Recorded in QDS. Low probability
<i>Ilex mitis var. mitis</i>	October-December	Riverbanks, streambeds, evergreen forests.	N/A	Least Concern ³	Recorded in QDS. No suitable habitat

SPECIES	FLOWERING SEASON	SUITABLE HABITAT	PRIORITY GROUP	CONSERVATION STATUS	
				(¹ global status; ² national status); ³ Listed as species of concern by GDARD	
<i>Khadia beswickii</i>	July-April	Open areas on shallow surfaces over rocks in grassland.	A1	Vulnerable ¹	Low probability
<i>Lithops lesliei</i> <i>subsp. lesliei</i>	March-June	Primary habitat appears to be the arid grasslands in the interior of South Africa where it usually occurs in rocky places, growing under the protection of surrounding forbs and grasses.	A3	Near Threatened ²	Recorded in QDS. Low probability
<i>Melolobium subspicatum</i>	September-May	Grassland.	A1	Vulnerable ¹	Recorded within 5km. Suitable habitat
<i>Pearsonia bracteata</i>	December-April	Plants in Gauteng and North West occur in gently sloping Highveld grassland, while those in the Wolkberg were collected from steep wooded slopes and cliffs in river valleys.	A3	Near Threatened ¹	Recorded in QDS. Suitable habitat

5.2 Provincially protected plants

In addition to nationally-protected species, a number of species and genera are protected by provincial legislation (*Transvaal Nature Conservation Ordinance No. 12 of 1983*). No plants may be moved, harvested or damaged without permission from GDARD.

The following provincially protected plants were recorded:

Table 3: List of provincially protected plant species and locations recorded on study site

Species	Location
Crinum graminicola (colony)	S25°49'26.08"; E28°3'21.24"
	S25°49'25.54"; E28°3'21.69"
	S25°49'23.80"; E28°3'21.91"
	S25°49'24.36"; E28°3'21.98"
	S25°49'24.75"; E28° 3'19.49"
Brachystelma barberae	S25°49'21.18"; E28°3'19.69"
	S25°49'21.15"; E28°3'19.62"
	S25°49'21.27"; E28°3'19.77"
	S25°49'21.22"; E28°3'19.75"
	S25°49'23.85"; E28° 3'21.86"
Cheilanthes spp.	S25°49'22.87"; E28°3'18.56"

6 ALIEN INVASIVE SPECIES

The Conservation of Agricultural Resources Act (Act 43 of 1983, as amended) (CARA), categorizes alien invasive species into three categories.

1. Category 1 species are declared weeds that will no longer be tolerated within South Africa, and must be removed wherever they occur
2. Category 2 plants are species that can become invasive but have proven benefits or commercial value, and therefore can be grown under strict conditions, with a permit. Outside of areas specified in the permit, plants must be controlled

3. Category 3 plants are invasive species that are popular ornamentals, many of them being mature shade trees that will take long to replace. Plants may not be propagated, but existing plants need not be removed except where they encroach upon riparian areas.

Several alien invasive species were recorded on and near the site:

Opuntia sp.	Category 1
Melia azedarach	Category 1
Verbena bonariensis	Category 1

All three species were recorded on and in the immediate vicinity of the footprint of the proposed cell mast site, as well as scattered around the broader survey area.

All category 1 plants must be removed or controlled by the landowner, including follow-up control to ensure that recolonization of previously cleared areas does not occur.

7 FAUNAL METHODOLOGY

The majority of mammals, reptiles and amphibians are nocturnal by nature or most active at dusk and dawn. Avifauna species are nocturnal or diurnal depending on species. To evaluate fauna assemblages, a desktop assessment of the habitat was undertaken to determine the status of these groups through various field guides, atlases and available spatial data, including geological, hydrological and vegetative records. Recent aerial imagery from Google Earth and photographs of the site were also examined for further insight. Available vegetation and the presence of possible sensitive vegetation or aquatic areas that may be suitable habitat are related to the identification of the likelihood of occurrence of species as well as the identification of potential impacts resulting from the proposed development.

Relevant literature was consulted for the area, as well as relevant biodiversity databases to compile lists of fauna species likely to occur on site.

Mammals are named according to the *Field Guide to Mammals of Southern Africa* (Chris Stuart and Stuart 2001) and *The Mammals of the Southern African Sub region* (Skinner and Chimimba 2005). Reptiles are named using *The Field Guide to Snakes and Other Reptiles of Southern Africa* (Branch 1998) and amphibians through *Frogs & Frogging in Southern Africa* (Carruthers and Du Preez 2011). Birds were identified using *Sasol Birds of Southern Africa* (Sinclair et al. 2002).

7.1 Faunal results

7.1.1 Fauna habitat types

From the vegetation survey results and desktop analysis, the vegetation has been divided into fauna habitat types, namely transformed grassland to urban and exurban development, cultivated grassland, largely untransformed grassland, rocky outcrops and wetland / aquatic areas.

The urban, exurban and cultivated grasslands are greatly transformed. Although these areas may be utilised by fauna assemblages and hold biodiversity function, the interaction of fauna species with this habitat type is minimal, reserved to migratory pathways and some foraging.

The largely untransformed grassland and rocky outcrops are likely to be utilised widely by fauna assemblages for foraging and roosting and hold a higher biodiversity function than the urban, exurban and cultivated grasslands. Rocky outcrops provide unique habitats for plants and animals and play a main role in thermal regimes that can contribute to maintaining grassland ecology.

Wetland and aquatic areas are important faunal habitat and crucial to ecosystem and biodiversity function. These areas in the surrounds of the proposed mast location will provide habitat for foraging, roosting and migration to many faunal assemblages. These habitat types are listed as highly sensitive in terms of fauna and should not be disturbed.

7.1.2 Fauna assemblages

MAMMALS

A list of mammal species typical of the study area was obtained for reference purposes. The largely untransformed grassland, rocky outcrop areas and aquatic / wetland areas are likely ideal areas to support a high diversity of small to medium mammal species such as rodents, hares and small buck. The presence of these species will typically allow for the presence of small carnivores such as jackals. Mammals are mobile fauna assemblages that are able to adapt and relocate rapidly and therefore it is unlikely for the proposed mast construction to have a significant negative impact on mammal species. After construction of the mast it is anticipated for the mammals to reoccupy the area around the mast site.

The list of mammal species typical for the QDS 2528CC are found in Appendix B. Table 4 lists the mammal species of conservation concern recorded by the Gauteng Department of Agriculture and Rural Development (GDARD) that are likely to occur within the greater area. Their likelihood of occurrence within the study area and immediate surrounds is indicated.

Table 4: List of Mammal species of conservation concern that were recorded for the QDS 2528CC

COMMON NAME	SCIENTIFIC NAME	DESCRIPTION AND HABITAT AND FOOD REQUIREMENTS	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE
Serval	<i>Leptailurus serval</i>	<p>The Serval is a slender, medium sized cat with a small head, large ears, golden yellow coloured, spotted and striped coat, long legs and a black tipped tail.</p> <p>The species is active day and night and are generally solitary animals even if their ranges overlap.</p> <p>The Serval prefers areas with cover such as reeds and tall grasses in proximity to water bodies or wetlands in the Savannah regions of Southern Africa.</p> <p>They use their hearing to locate prey which includes rodents (particularly Vlei Rats), birds, frogs, insects and reptiles.</p>	<p>Near Threatened in South Africa.</p> <p>Least Concern globally.</p>	<p>Low – The species has not been present within the area due to development and human presence.</p>
Spotted Necked Otter	<i>Hydrictis maculicollis</i>	<p>The Spotted Necked Otter is a smallish species with a sleek body, webbed paws, a reddish to chocolate brown coat bearing white blotches on the chest and throat.</p> <p>The species has a large distribution but is restricted to areas of permanent fresh water such as lakes and large rivers which are unsilted, unpolluted and rich in small or medium sized fish. They travel on regularly used paths and are seldom found 10m away from water. They also require dense vegetative cover (long grasses, reeds, dense bushes) and prefer areas where large, piled boulders are found on the shoreline for shelter.</p> <p>The Spotted Necked Otter is diurnal, feeding mainly on fish but also frogs and small crustaceans. They hunt by sight and therefore require clear water with good visibility. They shelter at night in short burrows, rock crevices or patches of dense vegetation.</p>	<p>Near Threatened globally.</p>	<p>Low – although suitable habitat is present the species is not expected to be present due to the human presence in the area.</p>

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COMMON NAME	SCIENTIFIC NAME	DESCRIPTION AND HABITAT AND FOOD REQUIREMENTS	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE
Schreibers Long Fingered Bat	<i>Miniopterus schreibersii</i>	<p>The Schreibers Long Fingered Bat is a species of vesper bat that is medium sized with extremely long fingers and a wide wingspan. A small tarsus is visible in the ears and the body hairs stand erect.</p> <p>The species lives in large colonies that are established in a bell shaped hollow which traps body heat. Colonies are generally found in caves and mines. The species hibernate in winter.</p> <p>They forage in a variety of open and semi open, natural and artificial habitats (suburban areas) where they hunt moths and flies.</p>	Near Threatened globally.	High – Suitable roosting sites are present within the greater area. The species may utilise the area for foraging.
Geoffrey's Horseshoe Bat	<i>Rhinolophus clivosus</i>	<p>The Geoffreys Horseshoe Bat is a medium sized bat with soft, fluffy, greyish white fur and a horseshoe shaped nose leaf. They have very small eyes and large pale grey brown ears that are almost the same size as the head.</p> <p>These bats live in large colonies in temperate regions where caves, rock crevices, tree hollows, old mines and buildings are present.</p> <p>The bats fly low to forage for food which includes insects, beetles moths and grasshoppers. They prefer to forage in thickets than in grassland.</p> <p>In South Africa, the species mates in May with ovulation and fertilisation occurring in August. Birth of the young occurs in December.</p>	Data Deficient in South Africa.	Low – preferred foraging habitat is limited in the area.

COMMON NAME	SCIENTIFIC NAME	DESCRIPTION AND HABITAT AND FOOD REQUIREMENTS	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE
South African Hedgehog	<i>Atelerix frontalis</i>	<p>The South African Hedgehog is a small mammal, mainly brown in colour and covered with keratin protein spines except on its face, belly and ears. The spines are white at the base and dark brown at the tip. They are nocturnal, foraging at night and staying in a hole in the ground or an area covered with vegetation during the day. The species hibernates during winter.</p> <p>They prefer grassland and bushveld that is not too damp with a covering of leaves and debris. They are not reliant on free water as they obtain most of their hydration requirements from the food they eat.</p> <p>The South African Hedgehog is an insectivore eating mainly earthworms and crickets. However, due to habitat loss many populations have become omnivorous and eat some plant matter.</p>	Near Threatened in Southern Africa. Least Concern globally.	Low – Due to proximity to informal settlements it is likely that this species has been persecuted and hunted out of the area.

AVIFAUNA

A list of avifauna species for Quarter Degree Square 2528CC was obtained for reference purposes. The grassland and aquatic / wetland areas will play an important role for avifauna species which may use the area for foraging and roosting as well as flight paths and migratory corridors. Avifauna are mobile fauna assemblages that are able to adapt and relocate rapidly and therefore it is unlikely for the proposed mast construction to have a significant negative impact on avifauna species based on its small occupational area. The height of the mast may play a role in avifauna impacts which will be discussed below.

The list of bird species typical for the QDS 2528CC are found in Appendix C. Table 5 lists the avifauna species of conservation concern recorded by the Gauteng Department of Agriculture and Rural Development (GDARD) that are likely to occur within the greater area. Their likelihood of occurrence within the study area and immediate surrounds is indicated.

Table 5: List of Avifauna species of conservation concern that may occur within the QDS 2528CC

COMMON NAME	SCIENTIFIC NAME	DESCRIPTION AND HABITAT AND FOOD REQUIREMENTS	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE
Yellow Billed Stork	<i>Mycteria ibis</i>	The Yellow Billed Stork is a medium sized, wading bird that has a white body with a short black tail that is glossed green and purple when newly moulted. It has a deep yellow bill and feathers that extend onto the head and neck just behind the eyes. The face and forehead are covered by deep red skin. The species is found in wetlands, shallow lakes and mudflats but avoid flooded areas and deep water bodies. The Yellow Billed Stork feeds of small fresh water fish, crustaceans, worms, insects and frogs.	Near Threatened in South Africa. Least Concern Globally.	Low – the species prefers wetlands which are not present within the mast location and immediate surrounds.
White Bellied Korhaan	<i>Eupodotis senegalensis</i>	The White Bellied Korhaan is an African Bustard Species that has a tawny brown upper part and breast, a white belly and cream coloured legs. The female has a grey crown, a brown line below the eye and black speckling on the throat. The male has a black crown, black lines on white cheeks and a black patch on the throat. The species is found in fairly tall, dense, sour or mixed grassland either in open or lightly wooded areas. They occasionally move into cultivated or burnt land. The species is omnivorous feeding on invertebrates, lizards and plant matter mainly foraging via walking and pecking the ground.	Vulnerable in South Africa. Endemic.	Medium – no accounts or indications of the species has been found in the area but suitable habitat exists in the great surrounds of the mast.
Red Footed Falcon	<i>Falco vespertinus</i>	The Red Footed Falcon is a migratory falcon species that winters in Africa. It is a medium to small bird. The male is blue grey with a red under tail and legs. The female has a grey back and wings, an orange head and underparts with a white face. The species prefers Steppe type habitats in open country with some trees, often near water. They feed on insects, amphibians, reptiles, mammals and birds, hunting via hovering and then making a short steep dive to its target.	Near Threatened.	Low – suitable habitat is not present. Last sighting was prior to 2007.

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COMMON NAME	SCIENTIFIC NAME	DESCRIPTION AND HABITAT AND FOOD REQUIREMENTS	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE
Marabou Stork	<i>Leptoptilos crumenifer</i>	The Marabou Stork is a large wading bird with cloak like wings and back, skinny white legs, a bare head and neck, a huge bill and a pink gular sac on the throat. The species is found in wet and arid habitats as well in association with human habitats especially landfill sites. They are colonial breeders which scavenge on carrion and faeces. During the breeding season they feed on live preys such as fish, frogs, insects, small mammals and reptiles.	Near Threatened in South Africa. Least Concern Globally.	Low – Suitable habitat unavailable.
Maccoa Duck	<i>Oxyura maccoa</i>	The Maccoa Duck is a diving duck with a stiff tail. The male has a chestnut body, blue bill and black head. The female has a grey brown body, dark grey bill and brown crown. The species is found in shallow, fresh water in summer and brackish and saline lakes in winter, generally in the Highveld regions. They like to frequent wetlands with a high concentration of benthic or bottom dwelling invertebrates but will also eat aquatic plant material (seeds and roots).	Near Threatened.	Medium – Suitable habitat is present within the study area and surrounds although no direct sightings of the species has been seen in the area since 2007
Lanner Falcon	<i>Falco biarmicus</i>	The Lanner Falcon is a medium sized bird of prey with slate grey or brown grey underparts and paler blue grey upper parts and a reddish back to the head. The species prefers open country and savannah where it hunts by horizontal pursuit.	Near Threatened in South Africa. Least Concern Globally.	Medium – Suitable habitat occurs for the species in the area however the last known account is prior to 2007.
Greater Flamingo	<i>Phoenicopterus roseus</i>	The greater flamingo is a large bird with pinkish white feathers, wing coverts that are red and primary and secondary flight feathers that are black. They have a pink bill that ends in a black tip and pink legs. The species lives in mudflats and shallow coastal lagoons where they feed on small shrimp, seeds, blue green algae and molluscs.	Near Threatened in South Africa. Least Concern Globally.	Low – no suitable habitat is present within the study area and surrounds.

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COMMON NAME	SCIENTIFIC NAME	DESCRIPTION AND HABITAT AND FOOD REQUIREMENTS	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE
Lesser Flamingo	<i>Phoenicopterus minor</i>	<p>The Lesser Flamingo is smaller than the Greater Flamingo and is also pinkish white in colour. The species has a black bill with a small amount of pink colouring and pink legs.</p> <p>The Lesser Flamingo is found near sodiac alkaline water that is generally not suitable for irrigation. They feed on spirulina (blue green algae) that grows in alkaline waters as well as shrimps.</p>	Near Threatened.	Low – no suitable habitat is present within the study area and surrounds.
African Grass Owl	<i>Tyto capensis</i>	<p>The African Grass Owl is identified by its heart shaped whitish cream facial disc and narrow yellowish buff rim which is densely spotted. The bill is white to pale pink. Its upper parts are bluish brown with scattered small white spots and grey flecks while the underparts vary from white to buff with dark spots.</p> <p>The species is typically found in moist grassland and open savannah. In South Africa, the species prefers marshes and vleis with patches of tall, rank grass. They roost on the ground in the tall rank grasses where they create domed platforms and tunnels by trampling the grass. The African Grass Owl hunt using an erratic flight pattern close to the ground or they hunt from a perch. Their preferred prey are rodents and other small mammals.</p> <p>They breed from December to August but mainly in February to April. The nest is a shallow hollow on the ground.</p>	Vulnerable in South Africa. Least Concern Globally.	High – The species has been recorded from the greater area and suitable habitat occurs within the larger vicinity of the mast.
African Finfoot	<i>Podica senegalensis</i>	<p>The African Finfoot is an aquatic bird that is found in rivers and lakes. It has a long neck, sharp distinctive beak and bright red lobed feet.</p> <p>The species frequents a range of habitats where there are rivers, streams or lakes with good cover on the banks. They feed on aquatic invertebrates such as mayflies and dragon flies and also are known to feed on crustaceans, snails, small fish and amphibians.</p>	Vulnerable in South Africa. Least Concern Globally.	Medium – suitable habitat is present within the vicinity of the mast and surrounds.

COMMON NAME	SCIENTIFIC NAME	DESCRIPTION AND HABITAT AND FOOD REQUIREMENTS	CONSERVATION STATUS	LIKELIHOOD OF OCCURRENCE
Abdims Stork	<i>Ciconia abdimii</i>	The Abdims Stork is a black stork with grey legs, red knees and feet, a grey bill, white underparts, red facial skin in front of the eye and blue skin near the bill during the breeding season. The species prefers open habitats in savannah woodland, grassland, pastures, pan edges, cultivated land and suburban areas. They feed on locusts, caterpillars, other large insects, small reptiles, amphibians and sometimes mice, crabs and eggs.	Near Threatened in South Africa. Least Concern Globally.	Medium – Suitable habitat is present for the species. The last known sighting was in 2012.

HERPETOFAUNA

Comprehensive amphibian surveys and therefore a list of possible species can only be undertaken by nocturnal surveys throughout the duration of the wet season. This was beyond the current scope of the assessment and the area was surveyed via desktop based on the hydrology of the area. The Hennops river and wetland areas are present within the surrounds of the study area and therefore it is expected for amphibian species to be present within the proposed mast installation although none are considered as red data species.

The area is known to host the Giant Bullfrog (*Pyxicephalus adspersus*), which although no longer on the Red Data List is still of conservation concern. Mitigation regarding this species will be considered.

The Giant Bullfrog species spends most of its life underground aestivating (dormant) and emerges after heavy rainfall to begin breeding for approximately a month. When breeding is completed the adults and juveniles will migrate up to 150m from the breeding site to find suitable aestivation sites where they will burrow into the ground and wait for favourable conditions. The Giant Bullfrog is therefore most vulnerable during its long aestivation phase when they are undetected and harmed during construction works or when breeding habitat is lost due to development (Alexander 2004).

Giant Bullfrogs have specific habitat requirements which include (Alexander, 2004):

- Shallow, ephemeral pans or depressions with the capacity to store water for a month at the least;
- Easy access to the pans and depressions with marginal vegetation not restricting access;
- Soils surrounding the pans and depressions should be suitable for aestivation such as grey clay or deep sandy soils; and
- Foraging habitat should be present adjacent to the breeding site (open grassland).

South Africa has a high diversity of reptile species, with more endemic reptile species than mammal species. Reptiles are generally shy and extremely sensitive to habitat destruction and transformation. The Coppery Grass Lizard (*Chamaesaura aenea* – Near Threatened) and the Striped Harlequin Snake (*Homoroselaps dorsalis* – Near Threatened) have been recorded historically for the QDS 2528CC. It is however unlikely for these species to be found within the study area and surrounds due to the close proximity of human populations who are fearful of reptiles.

The list of herpetofauna species typical for the QDS 2528CC are found in Appendix D.

8 SENSITIVITY

8.1 Mapping

Two zones of sensitivity were mapped in the study area, based on the information available. They were mapped as “more sensitive” and “less sensitive”, a relative term used to subdivide the study area (i.e. “less sensitive” areas may still be sensitive in the absolute sense, but not necessarily as sensitive as the areas mapped as “more sensitive”).

The criteria for mapping the more sensitive areas were:

- 1) The mapped wetland/riparian buffer zone around the Hennops River and
- 2) A 15m buffer around the **known** threatened or protected species.

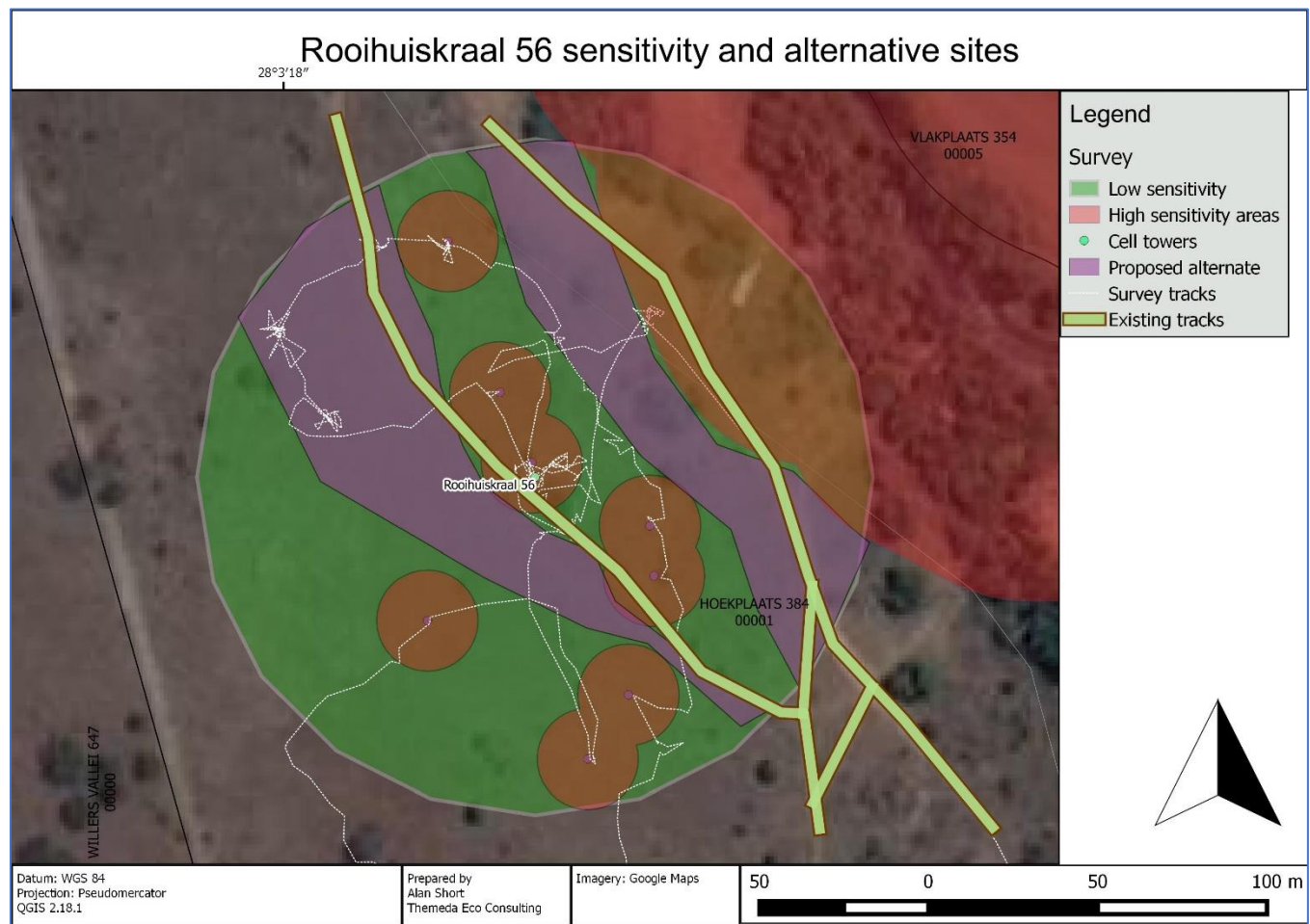
The remaining area was mapped as “less sensitive” by default. Note that there is a possibility of other populations of threatened or protected species occurring in the “less sensitive” area, that were missed by the survey.

The sensitivity score was calculated by summing the scores for each of six criteria, as described in Appendix A (Table 6). The areas mapped as “less sensitive” had a calculated sensitivity of medium, with a calculated sensitivity of high for the more sensitive areas.

Table 6: Sensitivity assessment of habitat at Rooihuiskraal 56 site. See Map for less and more sensitive areas

Rooihuiskraal 56	Less sensitive areas	More sensitive areas
Listed ecosystems	3 – critically endangered	3 – critically endangered
Habitat	2 – sub-climax state	2 – sub - climax state
Protection	2 - Provincial policies and guidelines	2 - Provincial policies and guidelines
Suitable habitat / presence of threatened species	2 - Confirmed presence of Declining species and suitable habitat and some	3 - Confirmed presence

	likelihood of occurrence of Threatened species	
Ecological function	2 - Medium to high: Vegetation communities that occur at disturbances of low-medium intensity and representative of secondary succession stages with a high degree of connectivity with other ecological systems OR disturbed vegetation connected to an ecological and protected system e.g. ridge, wetland or river	3 - High: Sensitive vegetation communities with low inherent resistance or resilience towards disturbance factors; vegetation that are considered important for the maintenance of ecosystem integrity. Most of these vegetation communities represent late succession ecosystems with high connectivity with other important ecological systems.
Total	11 – Medium	13 – high



Map 8: Sensitivity of the study area. Areas in red are more sensitive (wetland/riparian buffers and 15m buffers around known provincially-protected plants). Area in green is less sensitive. The “proposed alternate” areas are the least sensitive areas.

9 IMPACT AND MITIGATION

The impact of the cell mast construction and operation was considered with reference to the spatial extent of the project, the sensitivity of the environment, the likelihood of the impact occurring, the magnitude of the impact, and the duration of the impact, both with and without mitigation (Table 3).

Table 4: Impact assessment table-construction activities

Phase	Impact	Description	Extent	Sensitivity of environment	Probability of impact	Magnitude of impact	Duration	Impact without mitigation	Impact with mitigation
Construction	Destruction of protected species	Destruction of protected plants by project footprint	Very small	High	High	Low	Permanent	Medium	Low
		Destruction of protected plants by construction activities	Small	High	High	Low	Temporary	Medium	Low
	Destruction of natural vegetation	Construction removing natural vegetation from project footprint	Very small	High	High	Low	Permanent	Medium	Low
		Construction impacting natural vegetation around project footprint	Small	High	Medium	Low	Temporary	Medium	Low
	Spread of alien invasive plant species into disturbed soils	Invasive species occurring on the site spreading into disturbed soils	Small	High	Medium	Medium	Temporary	High	Low
	Disturbance / Persecution / Hunting of fauna species	Construction and site personnel may disturb, persecute or hunt fauna species.	Small	Low	Medium	Low	Temporary	Medium	Low
Operation	Destruction of protected species	Removal/ damage to protected plants by maintenance workers	Very small	High	Low	Low	Permanent	Low	Low
	Destruction of natural vegetation	Access to site through undisturbed veg by maintenance workers	Very small	High	Low	Low	Temporary	Low	Low

Phase	Impact	Description	Extent	Sensitivity of environment	Probability of impact	Magnitude of impact	Duration	Impact without mitigation	Impact with mitigation
	Spread of alien invasive plant species into disturbed soils	Invasive species occurring on the site spreading into disturbed soils	Small	High	Medium	Medium	Temporary	High	Low
	Fauna Habitat Fragmentation	Removal of vegetation from project footprint and surrounds will create a barrier.	Small	Low	Low	Low	Temporary	Low	Low
	Pollution / Poisoning of Fauna Habitat	Run off containing hazardous matter, insecticides and pesticides may impact fauna habitat.	Small	High	Medium	Low	Temporary	Medium	Low

1) Destruction of protected species

At least three provincially-protected species were recorded on and around the site.

Mitigation measures – construction phase

- **It is recommended that the location of the cell mast be moved to a less sensitive portion of the study area, preferably towards the edge of the main dirt road.** The location of the proposed site contains provincially-protected plants as well as arboreal habitat (described below). Closer to the dirt road, the vegetation is more disturbed and less likely to harbor sensitive species
- Mark the plant, and any other plants observed on or near the site, and protect the marked plants from damage from construction activities;
- Should any protected plant be located on the site of the activity, obtain permission from GDARD to relocate the plants.
- Ensure that contractors do not remove any herbaceous plants and ferns from around the immediate environment of the construction footprint, other than known weeds or common grasses and shrubs.

Mitigation measures – operations

- Access to the site only through clearly demarcated access routes

- Workers/contractors may not remove or damage any listed species during the course of operations

2) Destruction of natural vegetation

The construction activity will have two effects: the removal of natural vegetation on the footprint of the cell tower and associated infrastructure, and the possible damage of surrounding vegetation by contractors during the construction phase. The vegetation immediately around the construction footprint is in **good** condition, and is a sensitive environment. The bush clumps immediately surrounding the proposed cell-mast site provide arboreal habitat for birds, reptiles and small mammals, as do the rocky outcrops on which these bush clumps occur.

Mitigation measures - construction

- **It is recommended that an alternative site be chosen, closer to the main dirt road, and out of the surrounding bush clumps which are vulnerable to removal or damage.** Alternatively, the location can be moved 30-50 north along the secondary dirt track on which the proposed site is currently located, or 40m south along the same track
- Clearly demarcate the construction site and any access paths or operational areas; contractors must stay within the demarcated areas;
- Follow the shortest access route from either the main dirt road, or the secondary track, to access the construction site;
- Remove all construction equipment and detritus after construction is complete;
- Rehabilitate temporary construction holding areas or access paths.
- Avoid bush clumps, geophytes, and rock outcrops both in the construction footprint and the access route.

Mitigation measures – operations

- Maintenance workers and contractors must access the site only through clearly demarcated access routes
- The footprint of damage to vegetation must be limited to the footprint of the activity and the immediate access route.
- Vegetation management around the site (e.g. firebreaks or clearing of shrubby/woody vegetation) should be limited to temporary measures such as mowing/slashing. No permanent vegetation removal should be conducted.
- Removal of any plants (e.g trees) should require the evaluation of an ECO and permission from the relevant authorities if necessary.

3) Spread of alien invasive species

Alien invasive species must be controlled in terms of the Conservation of Agricultural Resources Act and the National Environmental Management: Biodiversity Act. The onus on control usually falls on the landowner. However, all reasonable measures should be taken by the contractors and maintenance workers to prevent the spread of alien species through construction and operation of the cell mast.

Mitigation measures - construction

- A number of category 1 species grows on or in vicinity of the proposed footprint and will readily spread into disturbed soil. These species should be removed prior to construction and the disturbance footprint monitored for re-infestation for at least two years.
- Any alien species along proposed access routes should be removed and monitored.

Mitigation measures – operations

- Any alien plants occurring within the footprint of the activity should be removed and monitored as they occur. This includes the access route and any management buffer around the mast maintained by the applicant, such as firebreaks (if appropriate);
- Any areas of temporary disturbance caused by the construction activity should be monitored for alien plants and control measures implemented as appropriate

4) Habitat Fragmentation

The proposed development activity will involve the clearing of vegetation communities for construction of the mast, access road and fencing. It is not anticipated for the location to impact significantly on the fragmentation of habitat. However, changes to fauna habitat should be minimised to preserve biodiversity function.

Mitigation measures

- Clearly demarcate the construction site and any access paths or operational areas; contractors must stay within the demarcated areas;
- No construction vehicles or personnel should be allowed to leave the demarcated area unless authorised to do so;
- Once construction is complete, construction areas should be cleared of all construction vehicles and materials.

5) Disturbance / Persecution / Hunting of Fauna Species

Construction activities are generally associated with high ambient noise levels as well as habitat destruction discussed previously. Many of the larger terrestrial species will vacate the study area and

become displaced during the construction phase. It is however unlikely that the fauna community structures will change although there may be temporary changes in the distribution and abundance of fauna species during the construction phase. Killing and snaring of fauna species may occur when construction personnel and visitors are on the site. This may occur out of fear for certain fauna assemblages, a need for food or persecution for sport. Without mitigation this impact is considered of medium significance. With the implementation of the mitigation measures below, the significance of the impact can be substantially reduced to low.

Mitigation measures

- Areas that are not part of the site development plan should be marked as no-go zones;
- Construction activities should be limited to daylight hours;
- Construction vehicles transporting materials to and from the construction site must be covered to reduce the formation of dust.
- Construction personnel should be informed of the Animal Protection Act no. 71 of 1962 and encouraged not to harm any wildlife; and
- Construction personnel should undergo awareness training regarding fauna assemblages and the correct procedures to follow should fauna be found within the site. They should be encouraged not to harm any wildlife. They should also be informed of any policies and procedures applicable for fauna and the environment.

6) Pollution / Poisoning of Habitat

Hazardous material, insecticides and pesticides may be utilized on site to prevent unwanted vegetation growth or vermin fauna species from occupying the site of the mast. These materials may run off into the hydrological systems and into the grassland areas and have a negative impact fauna habitat.

- Hazardous materials should be correctly handled and stored on site,
- Environmentally friendly means of controlling pest species should be utilized, and
- Any spills of chemicals and the like should be cleaned up immediately following the appropriate clean up response.

10 CONCLUSIONS AND RECOMMENDATIONS IN TERMS OF APPENDIX 6 OF THE REGULATIONS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT

The site is in good condition with a high species diversity, and a high proportion of geophytes as well as other provincially-protected plants. Although no nationally-protected plants were observed, their presence cannot be ruled out. The site has areas of lower sensitivity where either alien vegetation (such as *Opuntia*) has encroached, or few species and habitats of high ecological value, such as bush clumps and threatened or protected species, are present.

The exact location of the proposed cell mast is between two bush clumps situated on shallow dolomitic outcrops. These bushclumps provide habitat and shelter for fauna, and, in addition, some provincially-protected species were recorded near the site, within or very close to the proposed footprint of the mast.

It should be considered to move the mast a few meters from the current proposed site. Several alternate sites are proposed, in all cases either along the secondary track on which the proposed site is currently located, or along the main dirt road:

- 1) A minimum of 30m north-west along the secondary track, to 100m north-west
- 2) Between 20 and 100 m south-east along the secondary track
- 3) Anywhere along the west side of the main dirt road, taking into account the riparian buffer zone of the Hennops River to the east.

The potential lowest-sensitivity areas into which the mast could be moved are shown in Map 8.

The objective of these recommendations are three-fold

- 1) Prevent the damage or destruction of arboreal habitat and threatened or protected species
- 2) Provide a ready access route for construction crews
- 3) Align the location of the mast with sites which have lower sensitivity, as a result of previous disturbance, particularly as the site falls within the Witwatersberg Pretoria Mountain Bushveld.

The project footprint is 10x10m, and therefore the impact will be small, particularly when proper mitigation measures are taken to minimise destruction of natural vegetation. Rocky outcrops and their associated vegetation should not be disturbed.

The construction of the cell-phone mast will have some impact on the vegetation. The environment is sensitive, and as a result we have recommended mitigation measures to ensure that impact is minimised. *Considering* the small footprint of the activity, and *provided* that appropriate mitigation measures be taken to minimize impact on the vegetation and faunal habitat, the cellphone mast can be erected pending approval by the authority.

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12 APPENDIX A: SENSITIVITY ASSESSMENT

The vegetation was mapped into approximately homogenous vegetation units, based on aerial imagery and the results of the field survey, as well as additional data such as the GDARD wetland buffer layer and the GDARD C-Plan layer.

Each polygon thus mapped was allocated a sensitivity score based on summing the scores for each of the following criteria:

1. The status of the regional vegetation that is expected to occur on the study site, only where natural vegetation is still remaining.

*This scoring is not applicable (N/A) for areas devoid of natural vegetation.

Listed Ecosystem*	Scoring
Primary state	3
Sub-climax state	2
Secondary state	1
No natural vegetation remaining	0

2. Whether the study area is situated within a Listed Ecosystem in terms of Section 52 of the National Environmental Management: Biodiversity Act (Act 10 of 2004) or in a vegetation that is classified as Vulnerable or Endangered.

Conservation status*	Scoring
Critically Endangered	3
Endangered	2
Vulnerable	1
Least threatened	0

3. Whether the vegetation or ecological feature is protected by legislation:

Listed Ecosystem*	Scoring
National legislation	3
Provincial policies and guidelines	2
Municipal or other protection	1
No legislated protection	0

4. The presence of suitable habitat for plants of conservation concern as well as the actual occurrence thereof.

Suitable habitat / presence	Scoring
Confirmed presence	3
Confirmed presence of Declining species and Suitable habitat and some likelihood of occurrence of Threatened species	2
Suitable habitat but unlikely to occur	1
No suitable habitat	0

5. Ecological Function: areas important to ecological processes such as ecological corridors, hydrological processes and important topographical features such as ridges.

Ecological function	Scoring
High: Sensitive vegetation communities with low inherent resistance or resilience towards disturbance factors; vegetation that are considered important for the maintenance of ecosystem integrity. Most of these vegetation communities represent late succession ecosystems with high connectivity with other important ecological systems.	3
Medium to high: Vegetation communities that occur at disturbances of low-medium intensity and representative of secondary succession stages with a high degree of connectivity with other ecological systems OR disturbed vegetation connected to an ecological and protected system e.g. ridge, wetland or river	2
Medium: Vegetation communities that occur at disturbances of medium intensity and representative of secondary succession stages with some degree or limited connectivity with other ecological systems	1
Low: Degraded and highly disturbed vegetation with little ecological function	0

6. Conservation Importance: indication of the necessity to conserve areas based on factors such as the importance of the site on a national and/or provincial scale and on the ecological state of the area (degraded or pristine). This is determined by the presence of a high diversity, rare or endemic species and areas that are protected by legislation.

Ecological importance	Scoring
High: Ecosystems with high species diversity and usually provide suitable habitat for a number of threatened species. OR protected ecosystems e.g. wetlands, riparian vegetation etc These areas should be protected	3
Medium to high: Ecosystems with intermediate levels of species with the possible occurrence of threatened species	2
Medium: Ecosystems with intermediate levels of species diversity without any threatened species.	1
Low: Areas with little or no conservation potential and usually species poor (most species are usually exotic).	0

13 APPENDIX B: MAMMAL LIST

Scientific Name	Common Name	Red List Category
<i>Aethomys</i>	Veld rats	Not listed
<i>Atelerix frontalis</i>	Southern African Hedgehog	Near Threatened
<i>Canis mesomelas</i>	Black-backed Jackal	Least Concern
<i>Crocidura hirta</i>	Lesser Red Musk Shrew	Data Deficient
<i>Crocidura silacea</i>	Lesser Gray-brown Musk Shrew	Data Deficient
<i>Cryptomys hottentotus</i>	Southern African Mole-rat	Least Concern
<i>Cynictis</i>	Yellow Mongoose	Not listed
<i>Dendromus mystacalis</i>	Chestnut African Climbing Mouse	Least Concern
<i>Epomophorus wahlbergi</i>	Epomophorus wahlbergi	Least Concern
<i>Felis catus</i>	Domestic Cat	Introduced
<i>Genetta maculata</i>	Common Large-spotted Genet (Rusty-spotted Genet)	Least Concern
<i>Genetta genetta</i>	Common Genet	Least Concern
<i>Genetta tigrina</i>	Cape Genet	Least Concern
<i>Graphiurus murinus</i>	Forest African Dormouse	Least Concern
<i>Hydricteis maculicollis</i>	Spotted Necked Otter	Near Threatened
<i>Hystrix africaeaustralis</i>	Cape Porcupine	Least Concern
<i>Leptailurus serval</i>	Serval	Near Threatened
<i>Lepus saxatilis</i>	Scrub Hare	Least Concern
<i>Mastomys coucha</i>	Southern African Mastomys	Least Concern
<i>Miniopterus schreibersii</i>	Shreibers Long Fingred Bat	Near Threatened
<i>Neoromicia capensis</i>	Cape Serotine	Least Concern
<i>Rattus</i>	Genus Rattus	Not listed
<i>Rattus rattus</i>	Roof Rat	Least Concern
<i>Rhabdomys pumilio</i>	Xeric Four-striped Grass Rat	Least Concern
<i>Rhinolophus clivosus</i>	Geoffreys Horseshoe Bat	Data Deficient
<i>Scotophilus dinganii</i>	Yellow-bellied House Bat	Least Concern

14 APPENDIX C: AVIFAUNA LIST

14.1 Avifaunal species previously recorded within the QDS 2528CC

Scientific Name	Common Name	IUCN STATUS
<i>Mycteria ibis</i>	Yellow Billed Stork	Near Threatened
<i>Eupodotis senegalensis</i>	White Bellied Korhaan	Vulnerable
<i>Falco vespertinus</i>	Red Footed Falcon	Near Threatened
<i>Leptoptilos crumenifer</i>	Marabou Stork	Near Threatened
<i>Oxyura maccoa</i>	Maccoa Duck	Near Threatened
<i>Falco biarmicus</i>	Lanner Falcon	Near Threatened
<i>Phoenicopterus roseus</i>	Greater Flamingo	Near Threatened
<i>Phoenicopterus minor</i>	Lesser Flamingo	Near Threatened
<i>Tyto capensis</i>	African Grass Owl	Vulnerable
<i>Podica senegalensis</i>	African Finfoot	Vulnerable
<i>Ciconia abdimii</i>	Abdims Stork	Near Threatened
<i>Streptopelia capicola</i>	Cape Turtle Dove	Least Concern
<i>Bubulcus ibis</i>	Cattle Egret	Least Concern
<i>Threskiornis aethiopicus</i>	Sacred ibis	Least Concern
<i>Passer melanurus</i>	Cape sparrow	Least Concern
<i>Upupa africana</i>	African Hoopoe	Least Concern
<i>Anthus cinnamomeus</i>	African Pipit	Least Concern
<i>Threskiornis aethiopicus</i>	African Sacred Ibis	Least Concern
<i>Saxicola torquatus</i>	African StoneChat	Least Concern
<i>Vanellus senegallus</i>	African Wattled Lapwing	Least Concern
<i>Prinia flavicans</i>	Black-chested Prinia	Least Concern
<i>Vanellus armatus</i>	Blacksmith Lapwing	Least Concern
<i>Crithagra atrogularis</i>	Black-throated Canary	Least Concern
<i>Lonchura cucullata</i>	Bronze Mannikin	Least Concern
<i>Lamprotornis nitens</i>	Cape Glossy Starling	Least Concern
<i>Cossypha caffra</i>	Cape Robin-Chat	Least Concern
<i>Streptopelia capicola</i>	Cape Turtle Dove	Least Concern
<i>Motacilla capensis</i>	Cape Wagtail	Least Concern
<i>Zosterops capensis</i>	Cape White-eye	Least Concern
<i>Sylvia subcaerulea</i>	Chestnut-vented Tit-Babbler	Least Concern
<i>Lanius collaris</i>	Common Fiscal	Least Concern
<i>Delichon urbicum</i>	Common House Martin	Least Concern
<i>Acridotheres tristis</i>	Common Myna	Least Concern
<i>Trachyphonus vaillantii</i>	Crested Barbet	Least Concern
<i>Pycnonotus tricolor</i>	Dark-capped Bulbul	Least Concern
<i>Bostrychia hagedash</i>	Hadedda Ibis	Least Concern
<i>Numida meleagris</i>	Helmeted Guineafowl	Least Concern
<i>Passer domesticus</i>	House Sparrow	Least Concern
<i>Streptopelia senegalensis</i>	Laughing Dove	Least Concern
<i>Ploceus intermedius</i>	Lesser Masked Weaver	Least Concern

Scientific Name	Common Name	IUCN STATUS
<i>Acrocephalus gracilirostris</i>	Lesser Swamp Warbler	Least Concern
<i>Cisticola tinniens</i>	Levaillant's Cisticola	Least Concern
<i>Cisticola fulvicapilla</i>	Neddicky	Least Concern
<i>Cisticola chiniana</i>	Rattling Cisticola	Least Concern
<i>Mirafraga africana</i>	Rufous-naped Lark	Least Concern
<i>Calendulauda sabota</i>	Sabota Lark	Least Concern
<i>Sporopipes squamifrons</i>	Scaly-feathered Finch	Least Concern
<i>Ploceus velatus</i>	Southern Masked Weaver	Least Concern
<i>Euplectes orix</i>	Southern Red Bishop	Least Concern
<i>Colius striatus</i>	Speckled Mousebird	Least Concern
<i>Prinia subflava</i>	Tawny-flanked Prinia	Least Concern

14.2 Bird list from Atlas SA project

	Ref	Species name	Afrikaans	Taxonomic name
1	622	Apalis, Bar-throated	Bandkeelkleinjantjie	Apalis thoracica
2	269	Avocet, Pied	Bontelsie	Recurvirostra avosetta
3	533	Babbler, Arrow-marked	Pylvlekkatlagter	Turdoides jardineii
4	536	Babbler, Southern Pied	Witkatlagter	Turdoides bicolor
5	432	Barbet, Acacia Pied	Bonthoutkapper	Tricholaema leucomelas
6	431	Barbet, Black-collared	Rooikophoutkapper	Lybius torquatus
7	439	Barbet, Crested	Kuifkophoutkapper	Trachyphonus vaillantii
8	673	Batis, Chinspot	Witliesbosbontrokkie	Batis molitor
9	404	Bee-eater, European	Europese Byvreter	Merops apiaster
10	410	Bee-eater, Little	Kleinbyvreter	Merops pusillus
11	409	Bee-eater, White-fronted	Rooikeelbyvreter	Merops bullockoides
12	808	Bishop, Southern Red	Rooivink	Euplectes orix
13	810	Bishop, Yellow	Kaapse Flap	Euplectes capensis
14	812	Bishop, Yellow-crowned	Goudgeelvink	Euplectes afer
15	67	Bittern, Little	Kleinrietreier (Woudapie)	Ixobrychus minutus
16	722	Bokmakierie, Bokmakierie	Bokmakierie	Telophorus zeylonus
17	709	Boubou, Southern	Suidelike Waterfiskaal	Laniarius ferrugineus
18	731	Brubru, Brubru	Bontroklaksman	Nilaus afer
19	545	Bulbul, Dark-capped	Swartoogtiptol	Pycnonotus tricolor
20	873	Bunting, Cape	Rooivlerkstreepkoppie	Emberiza capensis
21	872	Bunting, Cinnamon-breasted	Klipstreepkoppie	Emberiza tahapisi
22	874	Bunting, Golden-breasted	Rooirugstreepkoppie	Emberiza flaviventris
23	723	Bush-shrike, Grey-headed	Spookvoel	Malaconotus blanchoti
24	719	Bush-shrike, Orange-breasted	Oranjeborsboslaksman	Telophorus sulfureopectus
25	196	Buttonquail, Kurrichane	Bosveldkwarteltjie	Turnix sylvaticus
26	152	Buzzard, Jackal	Rooiborsjakkalsvoel	Buteo rufofuscus
27	144	Buzzard, Lizard	Akkedisvalk	Kaupifalco monogrammicus
28	154	Buzzard, Steppe	Bruinjakkalsvoel	Buteo vulpinus

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	Ref	Species name	Afrikaans	Taxonomic name
29	860	Canary, Black-throated	Bergkanarie	Crithagra atrogularis
30	859	Canary, Yellow-fronted	Geelooqkanarie	Crithagra mozambicus
31	575	Chat, Anteating	Swartpiek	Myrmecocichla formicivora
32	570	Chat, Familiar	Gewone Spekvreter	Cercomela familiaris
33	631	Cisticola, Cloud	Gevlekte Klopkloppie	Cisticola textrix
34	630	Cisticola, Desert	Woestynklopkloppie	Cisticola aridulus
35	648	Cisticola, Lazy	Luitinktinkie	Cisticola aberrans
36	646	Cisticola, Levillant's	Vleitinktinkie	Cisticola tinniens
37	642	Cisticola, Rattling	Bosveldtinktinkie	Cisticola chiniana
38	639	Cisticola, Wailing	Huiltinktinkie	Cisticola lais
39	634	Cisticola, Wing-snapping	Kleinste Klopkloppie	Cisticola ayresii
40	629	Cisticola, Zitting	Landeryklopkloppie	Cisticola juncidis
41	573	Cliff-chat, Mocking	Dassievoel	Thamnolaea cinnamomeiventris
42	504	Cliff-swallow, South African	Familieswael	Hirundo spilodera
43	212	Coot, Red-knobbed	Bleshoender	Fulica cristata
44	50	Cormorant, Reed	Rietduiker	Phalacrocorax africanus
45	47	Cormorant, White-breasted	Witborsduiker	Phalacrocorax carbo
46	4131	Coucal, Burchell's	Gewone Vleioerie	Centropus burchellii
47	1036	Coucal, White-browed	Gestreepte Vleioerie	Centropus superciliosus
48	277	Courser, Temminck's	Trekdrawwertjie	Cursorius temminckii
49	199	Crake, African	Afrikaanse Riethaan	Crecopsis egregia
50	203	Crake, Black	Swartriethaan	Amaurornis flavirostris
51	216	Crane, Blue	Bloukraanvoel	Anthropoides paradiseus
52	621	Crombec, Long-billed	Bosveldstompstert	Sylvietta rufescens
53	523	Crow, Cape	Swartkraai	Corvus capensis
54	522	Crow, Pied	Witborskraai	Corvus albus
55	344	Cuckoo, Black	Swartkoekoek	Cuculus clamosus
56	352	Cuckoo, Diderick	Diederikkie	Chrysococcyx caprius
57	346	Cuckoo, Great Spotted	Gevlekte Koekoek	Clamator glandarius
58	348	Cuckoo, Jacobin	Bontnuwejaarsvoel	Clamator jacobinus
59	351	Cuckoo, Klaas's	Meitjie	Chrysococcyx klaas
60	347	Cuckoo, Levillant's	Gestreepte Nuwejaarsvoel	Clamator levillantii
61	343	Cuckoo, Red-chested	Piet-my-vrou	Cuculus solitarius
62	513	Cuckoo-shrike, Black	Swartkatakoeroe	Campephaga flava
63	52	Darter, African	Slanghalsvoel	Anhinga rufa
64	317	Dove, Laughing	Rooiborsduifie	Streptopelia senegalensis
65	318	Dove, Namaqua	Namakwaduijie	Oena capensis
66	314	Dove, Red-eyed	Grootringduif	Streptopelia semitorquata
67	940	Dove, Rock	Tuinduif	Columba livia
68	517	Drongo, Fork-tailed	Mikstertbyvanger	Dicrurus adsimilis
69	95	Duck, African Black	Swarteend	Anas sparsa
70	91	Duck, Comb	Knobbeleend	Sarkidiornis melanotos

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	Ref	Species name	Afrikaans	Taxonomic name
71	10006	Duck, Domestic		Anas platyrhynchos
72	101	Duck, Fulvous	Fluiteend	Dendrocygna bicolor
73	10015	Duck, Hybrid Mallard	Mengel Groenkopeend	Anas hybrid
74	103	Duck, Maccoa	Bloubekeend	Oxyura maccoa
75	1016	Duck, Mallard	Groenkopeend	Anas platyrhynchos
76	1017	Duck, Mandarin		Aix galericulata
77	104	Duck, White-backed	Witrugeend	Thalassornis leuconotus
78	100	Duck, White-faced	Nonnetjie-eend	Dendrocygna viduata
79	10020	Duck, Wood		Aix sponsa
80	96	Duck, Yellow-billed	Geelbekeend	Anas undulata
81	139	Eagle, Booted	Dwergarend	Aquila pennatus
82	138	Eagle, Long-crested	Langkuifarend	Lophaetus occipitalis
83	142	Eagle, Martial	Breekoparend	Polemaetus bellicosus
84	133	Eagle, Verreaux's	Witkruisarend	Aquila verreauxii
85	137	Eagle, Wahlberg's	Bruinarend	Aquila wahlbergi
86	368	Eagle-owl, Spotted	Gevlekte Ooruil	Bubo africanus
87	61	Egret, Cattle	Veereier	Bubulcus ibis
88	58	Egret, Great	Grootwitreier	Egretta alba
89	59	Egret, Little	Kleinwitreier	Egretta garzetta
90	60	Egret, Yellow-billed	Geelbekwitreier	Egretta intermedia
91	119	Falcon, Amur	Oostelike Rooipootvalk	Falco amurensis
92	114	Falcon, Lanner	Edelvalk	Falco biarmicus
93	113	Falcon, Peregrine	Swerfvalk	Falco peregrinus
94	120	Falcon, Red-footed	Westelike Rooipootvalk	Falco vespertinus
95	854	Finch, Cuckoo	Koekoekvink	Anomalospiza imberbis
96	820	Finch, Red-headed	Rooskopvink	Amadina erythrocephala
97	789	Finch, Scaly-feathered	Baardmannetjie	Sporopipes squamifrons
98	213	Finfoot, African	Watertrapper	Podica senegalensis
99	833	Firefinch, African	Kaapse Vuurvinkie	Lagonosticta rubricata
100	835	Firefinch, Jameson's	Jamesonse Vuurvinkie	Lagonosticta rhodopareia
101	707	Fiscal, Common (Southern)	Fiskaallaksman	Lanius collaris
102	149	Fish-eagle, African	Visarend	Haliaeetus vocifer
103	86	Flamingo, Greater	Grootflamink	Phoenicopterus ruber
104	206	Flufftail, Buff-spotted	Gevlekte Vleikuiken	Sarothrura elegans
105	205	Flufftail, Red-chested	Roiborsvleikuiken	Sarothrura rufa
106	678	Flycatcher, Fairy	Feevlieievanger	Stenostira scita
107	665	Flycatcher, Fiscal	Fiskaalvlieievanger	Sigelus silens
108	664	Flycatcher, Southern Black	Swartvlieievanger	Melaenornis pammelaina
109	654	Flycatcher, Spotted	Europese Vlieievanger	Muscicapa striata
110	173	Francolin, Coqui	Swempie	Peliperdix coqui
111	174	Francolin, Crested	Bospatrys	Dendroperdix sephaena
112	179	Francolin, Orange River	Kalaharipatrys	Scleroptila levaillantoides
113	178	Francolin, Red-winged	Rooivlerkpatrys	Scleroptila levaillantii

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	Ref	Species name	Afrikaans	Taxonomic name
114	177	Francolin, Shelley's	Laeveldpatrys	Scleroptila shelleyi
115	339	Go-away-bird, Grey	Kwêvoel	Corythaixoides concolor
116	10004	Goose, Domestic		Anser anser
117	89	Goose, Egyptian	Kolgans	Alopochen aegyptiacus
118	88	Goose, Spur-winged	Wildemakou	Plectropterus gambensis
119	162	Goshawk, Gabar	Kleinsingvalk	Melierax gabar
120	360	Grass-owl, African	Grasuil	Tyto capensis
121	618	Grassbird, Cape	Grasvoel	Sphenoeacus afer
122	5	Grebe, Black-necked	Swartnekdoobertjie	Podiceps nigricollis
123	4	Grebe, Great Crested	Kuifkopdoobertjie	Podiceps cristatus
124	6	Grebe, Little	Kleindoobertjie	Tachybaptus ruficollis
125	323	Green-pigeon, African	Papegaaiduif	Treron calvus
126	263	Greenshank, Common	Groenpootruiter	Tringa nebularia
127	192	Guinea fowl, Helmeted	Gewone Tarentaal	Numida meleagris
128	288	Gull, Grey-headed	Gryskopmeeu	Larus cirrocephalus
129	72	Hamerkop, Hamerkop	Hamerkop	Scopus umbretta
130	171	Harrier-Hawk, African	Kaalwangvalk	Polyboroides typus
131	141	Hawk-eagle, African	Grootjagarend	Aquila spilogaster
132	140	Hawk-eagle, Ayres's	Kleinjagarend	Aquila ayresii
133	727	Helmet-shrike, White-crested	Withelmlaksman	Prionops plumatus
134	64	Heron, Black	Swartreier	Egretta ardesiaca
135	55	Heron, Black-headed	Swartkopreier	Ardea melanocephala
136	56	Heron, Goliath	Reusereier	Ardea goliath
137	63	Heron, Green-backed	Groenrugreier	Butorides striata
138	54	Heron, Grey	Bloureier	Ardea cinerea
139	57	Heron, Purple	Rooireier	Ardea purpurea
140	62	Heron, Squacco	Ralreier	Ardeola ralloides
141	115	Hobby, Eurasian	Europese Boomvalk	Falco subbuteo
142	132	Honey-buzzard, European	Wespedief	Pernis apivorus
143	443	Honeybird, Brown-backed	Skerpbekheuningvoel	Prodotiscus regulus
144	440	Honeyguide, Greater	Grootheuningwyser	Indicator indicator
145	442	Honeyguide, Lesser	Kleinheuningwyser	Indicator minor
146	418	Hoopoe, African	Hoephoep	Upupa africana
147	424	Hornbill, African Grey	Gryseushoringvoel	Tockus nasutus
148	4129	Hornbill, Red-billed	Rooibekneushoringvoel	Tockus erythrorhynchus
149	426	Hornbill, Southern Yellow-billed	Geelbekneushoringvoel	Tockus leucomelas
150	507	House-martin, Common	Huisswael	Delichon urbicum
151	81	Ibis, African Sacred	Skoorsteenveer	Threskiornis aethiopicus
152	83	Ibis, Glossy	Glansibis	Plegadis falcinellus
153	84	Ibis, Hadedda	Hadedda	Bostrychia hagedash
154	850	Indigobird, Purple	Witpootblouvinkie	Vidua purpurascens
155	228	Jacana, African	Grootlangtoon	Actophilornis africanus
156	122	Kestrel, Greater	Grootrooivalk	Falco rupicoloides
157	125	Kestrel, Lesser	Kleinrooivalk	Falco naumanni
158	123	Kestrel, Rock	Kransvalk	Falco rupicolus

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	Ref	Species name	Afrikaans	Taxonomic name
159	402	Kingfisher, Brown-hooded	Bruinkopvisvanger	Halcyon albiventris
160	395	Kingfisher, Giant	Reusevisvanger	Megaceryle maximus
161	396	Kingfisher, Half-collared	Blouvisvanger	Alcedo semitorquata
162	397	Kingfisher, Malachite	Kuifkopvisvanger	Alcedo cristata
163	394	Kingfisher, Pied	Bontvisvanger	Ceryle rudis
164	399	Kingfisher, Woodland	Bosveldvisvanger	Halcyon senegalensis
165	14189	Kite, Black	Swartwou	Milvus migrans
166	128	Kite, Black	Swartwou	Milvus migrans
167	130	Kite, Black-shouldered	Blouvalk	Elanus caeruleus
168	129	Kite, Yellow-billed	Geelbekwou	Milvus aegyptius
169	1035	Korhaan, Northern Black	Witvlrkkorhaan	Afrotis afroides
170	222	Korhaan, White-bellied	Witpenskorhaan	Eupodotis senegalensis
171	247	Lapwing, African Wattled	Lelkiewiet	Vanellus senegallus
172	245	Lapwing, Blacksmith	Bontkiewiet	Vanellus armatus
173	242	Lapwing, Crowned	Kroonkiewiet	Vanellus coronatus
174	3550	Lark, Agulhas Clapper	Overbergklappertjie	Mirafra marjoriae
175	4123	Lark, Agulhas Long-billed	Overberglangbeklewerik	Certhilauda brevirostris
176	4124	Lark, Benguela Long-billed	Kaokolangbeklewerik	Certhilauda benguelensis
177	4140	Lark, Cape Clapper	Kaapse Klappertjie	Mirafra apiata
178	4125	Lark, Cape Long-billed	Weskuslangbeklewerik	Certhilauda curvirostris
179	1183	Lark, Eastern Clapper	Hoefeldklappertjie	Mirafra fasciolata
180	4126	Lark, Eastern Long-billed	Grasveldlangbeklewerik	Certhilauda semitorquata
181	459	Lark, Fawn-coloured	Vaalbruinlewerik	Calendulauda africanoides
182	4127	Lark, Karoo Long-billed	Karoolangbeklewerik	Certhilauda subcoronata
183	456	Lark, Melodious	Spotlewerik	Mirafra cheniana
184	490	Lark, Pink-billed	Pienkbeklewerik	Spizocorys conirostris
185	488	Lark, Red-capped	Rooikoplewerik	Calandrella cinerea
186	458	Lark, Rufous-naped	Rooineklewerik	Mirafra africana
187	460	Lark, Sabota	Sabotalewerik	Calendulauda sabota
188	474	Lark, Spike-heeled	Vlaktelewerik	Chersomanes albofasciata
189	703	Longclaw, Cape	Oranjekeelkalkoentjie	Macronyx capensis
190	330	Lovebird, Rosy-faced	Rooiwangparkiet	Agapornis roseicollis
191	823	Mannikin, Bronze	Gewone Fret	Spermestes cucullatus
192	167	Marsh-harrier, African	Afrikaanse Vleivalk	Circus ranivorus
193	510	Martin, Banded	Gebande Oewerswael	Riparia cincta
194	509	Martin, Brown-throated	Afrikaanse Oewerswael	Riparia paludicola
195	506	Martin, Rock	Kransswael	Hirundo fuligula
196	508	Martin, Sand	Europese Oewerswael	Riparia riparia
197	792	Masked-weaver, Lesser	Kleingeelvink	Ploceus intermedius
198	803	Masked-weaver, Southern	Swartkeelgeelvink	Ploceus velatus
199	210	Moorhen, Common	Grootwaterhoender	Gallinula chloropus
200	392	Mousebird, Red-faced	Rooiwangmuisvoel	Urocolius indicus

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	Ref	Species name	Afrikaans	Taxonomic name
201	390	Mousebird, Speckled	Gevlekte Muisvoel	Colius striatus
202	391	Mousebird, White-backed	Witkruisuisvoel	Colius colius
203	734	Myna, Common	Indiese Spreeu	Acridotheres tristis
204	637	Neddicky, Neddicky	Neddikkie	Cisticola fulvicapilla
205	69	Night-Heron, Black-crowned	Gewone Nagreier	Nycticorax nycticorax
206	373	Nightjar, Fiery-necked	Afrikaanse Naguil	Caprimulgus pectoralis
207	374	Nightjar, Freckled	Donkernaguil	Caprimulgus tristigma
208	372	Nightjar, Rufous-cheeked	Rooiwangnaguil	Caprimulgus rufigena
209	312	Olive-pigeon, African	Geelbekbosduif	Columba arquatrix
210	74	Openbill, African	Oopbekooievaar	Anastomus lamelligerus
211	521	Oriole, Black-headed	Swartkopwielewaal	Oriolus larvatus
212	1	Ostrich, Common	Volstruis	Struthio camelus
213	359	Owl, Barn	Nonnetjie-uil	Tyto alba
214	361	Owl, Marsh	Vlei-uil	Asio capensis
215	365	Owlet, Pearl-spotted	Witkoluil	Glaucidium perlatum
216	387	Palm-swift, African	Palmswindswael	Cypsiurus parvus
217	682	Paradise-flycatcher, African	Paradysvlievanger	Terpsiphone viridis
218	852	Paradise-whydah, Long-tailed	Gewone Paradysvink	Vidua paradisaea
219	941	Parakeet, Rose-ringed	Ringnekparkiet	Psittacula krameri
220	1021	Peacock, Common	Makpou	Pavo cristatus
221	788	Petronia, Yellow-throated	Geelvlakmossie	Petronia superciliaris
222	311	Pigeon, Speckled	Kransduif	Columba guinea
223	692	Pipit, African	Gewone Koester	Anthus cinnamomeus
224	695	Pipit, Buffy	Vaalkoester	Anthus vaalensis
225	699	Pipit, Bushveld	Bosveldkoester	Anthus caffer
226	693	Pipit, Long-billed	Nicholsonse Koester	Anthus similis
227	694	Pipit, Plain-backed	Donkerkoester	Anthus leucophrys
228	696	Pipit, Striped	Gestreepte Koester	Anthus lineiventris
229	238	Plover, Three-banded	Driebandstrandkiewiet	Charadrius tricollaris
230	1332	Pochard, Red-crested		Netta rufina
231	102	Pochard, Southern	Bruineend	Netta erythrophthalma
232	650	Prinia, Black-chested	Swartbandlangstertjie	Prinia flavicans
233	649	Prinia, Tawny-flanked	Bruinsylangstertjie	Prinia subflava
234	712	Puffback, Black-backed	Sneebal	Dryoscopus cubla
235	189	Quail, Common	Afrikaanse Kwartel	Coturnix coturnix
236	844	Quail finch, African	Gewone Kwartelvinkie	Ortygospiza atricollis
237	805	Quelea, Red-billed	Rooibekwelea	Quelea quelea
238	197	Rail, African	Grootriethaan	Rallus caerulescens
239	606	Reed-warbler, African	Kleinrietsanger	Acrocephalus baeticatus
240	603	Reed-warbler, Great	Grootrietsanger	Acrocephalus arundinaceus
241	581	Robin-chat, Cape	Gewone Janfrederik	Cossypha caffra
242	582	Robin-chat, White-throated	Witkeeljanfrederik	Cossypha humeralis
243	559	Rock-thrush, Cape	Kaapse Kliplyster	Monticola rupestris
244	560	Rock-thrush, Sentinel	Langtoonkliplyster	Monticola explorator
245	412	Roller, European	Europese Troupant	Coracias garrulus
246	413	Roller, Lilac-breasted	Gewone Troupant	Coracias caudatus

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	Ref	Species name	Afrikaans	Taxonomic name
247	256	Ruff, Ruff	Kemphaan	Philomachus pugnax
248	609	Rush-warbler, Little	Kaapse Vleisanger	Bradypterus baboecala
249	258	Sandpiper, Common	Gewone Ruiters	Actitis hypoleucos
250	262	Sandpiper, Marsh	Moerasruiter	Tringa stagnatilis
251	264	Sandpiper, Wood	Bosruiter	Tringa glareola
252	421	Scimitarbill, Common	Swartbekkakaar	Rhinopomastus cyanomelas
253	364	Scops-owl, Southern White-faced	Witwanguil	Ptilopus granti
254	588	Scrub-robin, White-browed	Gestreepte Wipstert	Cercotrichas leucophrys
255	867	Seedeater, Streaky-headed	Streepkopkanarie	Crithagra gularis
256	90	Shelduck, South African	Kopereend	Tadorna cana
257	161	Shikra, Shikra	Gebande Sperwer	Accipiter badius
258	94	Shoveler, Cape	Kaapse Slopeend	Anas smithii
259	711	Shrike, Crimson-breasted	Rooiborslaksman	Laniarius atrococcineus
260	706	Shrike, Lesser Grey	Gryslaksman	Lanius minor
261	724	Shrike, Magpie	Langstertlaksman	Corvinella melanoleuca
262	708	Shrike, Red-backed	Rooiruglaksman	Lanius collurio
263	146	Snake-eagle, Black-chested	Swartborslangarend	Circaetus pectoralis
264	145	Snake-eagle, Brown	Bruinslangarend	Circaetus cinereus
265	250	Snipe, African	Afrikaanse Snip	Gallinago nigripennis
266	786	Sparrow, Cape	Gewone Mossie	Passer melanurus
267	785	Sparrow, Great	Grootmossie	Passer motitensis
268	784	Sparrow, House	Huis mossie	Passer domesticus
269	3852	Sparrow, Northern Grey-headed	Witkeelmossie	Passer griseus
270	4142	Sparrow, Southern Grey-headed	Gryskopmossie	Passer diffusus
271	780	Sparrow-weaver, White-browed	Koringvoel	Plocepasser mahali
272	159	Sparrowhawk, Black	Swartsperwer	Accipiter melanoleucus
273	158	Sparrowhawk, Little	Kleinsperwer	Accipiter minullus
274	157	Sparrowhawk, Ovambo	Ovambosperwer	Accipiter ovampensis
275	85	Spoonbill, African	Lepelaar	Platalea alba
276	183	Spurfowl, Natal	Natalse Fisant	Pternistis natalensis
277	185	Spurfowl, Swainson's	Bosveldfisant	Pternistis swainsonii
278	737	Starling, Cape Glossy	Kleinglansspreeu	Lamprotonis nitens
279	733	Starling, Common	Europese Spreeu	Sturnus vulgaris
280	746	Starling, Pied	Witgatspreeu	Spreo bicolor
281	745	Starling, Red-winged	Rooivlerkspreeu	Onychognathus morio
282	736	Starling, Violet-backed	Witborsspreeu	Cinnyricinclus leucogaster
283	735	Starling, Wattled	Lelspreeu	Creatophora cinerea
284	270	Stilt, Black-winged	Rooipootelsie	Himantopus himantopus
285	253	Stint, Little	Kleinstrandloper	Calidris minuta
286	576	Stonechat, African	Gewone Bontrokkie	Saxicola torquatus

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	Ref	Species name	Afrikaans	Taxonomic name
287	78	Stork, Abdim's	Kleinswartoievaar	Ciconia abdimii
288	79	Stork, Black	Grootwartoievaar	Ciconia nigra
289	80	Stork, White	Witooievaar	Ciconia ciconia
290	76	Stork, Yellow-billed	Nimmersat	Mycteria ibis
291	772	Sunbird, Amethyst	Swartsuikerbekkie	Chalcomitra amethystina
292	758	Sunbird, Greater Double-collared	Groot-rooibandsuikerbekkie	Cinnyris afer
293	751	Sunbird, Malachite	Jangroentjie	Nectarinia famosa
294	755	Sunbird, Marico	Maricosuikerbekkie	Cinnyris mariquensis
295	763	Sunbird, White-bellied	Witpensuikerbekkie	Cinnyris talatala
296	493	Swallow, Barn	Europese Swael	Hirundo rustica
297	502	Swallow, Greater Striped	Grootstreepswael	Hirundo cucullata
298	503	Swallow, Lesser Striped	Kleinstreepswael	Hirundo abyssinica
299	498	Swallow, Pearl-breasted	PiÅ½relborsswael	Hirundo dimidiata
300	501	Swallow, Red-breasted	Rooiborsswael	Hirundo semirufa
301	495	Swallow, White-throated	Witkeelswael	Hirundo albigularis
302	604	Swamp-warbler, Lesser	Kaapse Rietsanger	Acrocephalus gracilirostris
303	208	Swamphen, African Purple	Grootkoningriethaan	Porphyrio madagascariensis
304	10007	Swan, Black		Cygnus atratus
305	380	Swift, African Black	Swartwindswael	Apus barbatus
306	386	Swift, Alpine	Witpenswindswael	Tachymarptis melba
307	378	Swift, Common	Europese Windswael	Apus apus
308	384	Swift, Horus	Horuswindswael	Apus horus
309	385	Swift, Little	Kleinwindswael	Apus affinis
310	383	Swift, White-rumped	Witkruiswindswael	Apus caffer
311	715	Tchagra, Black-crowned	Swartkroontjagra	Tchagra senegalus
312	714	Tchagra, Brown-crowned	Rooivlerktjagra	Tchagra australis
313	98	Teal, Cape	Teeleend	Anas capensis
314	99	Teal, Hottentot	Gevlekte Eend	Anas hottentota
315	97	Teal, Red-billed	Rooibekeend	Anas erythrorhyncha
316	305	Tern, Whiskered	Witbaardsterretjie	Chlidonias hybrida
317	304	Tern, White-winged	Witvlerksterretjie	Chlidonias leucopterus
318	275	Thick-knee, Spotted	Gewone Dikkop	Burhinus capensis
319	557	Thrush, Groundscraper	Gevlekte Lyster	Psophocichla litsipsirupa
320	1104	Thrush, Karoo	Geelbeklyster	Turdus smithi
321	552	Thrush, Kurrichane	Rooibeklyster	Turdus libonyanus
322	1105	Thrush, Olive	Olyflyster	Turdus olivaceus
323	437	Tinkerbird, Yellow-fronted	Geelblestinker	Pogoniulus chrysoconus
324	514	Tit, Ashy	Akasiagrysmees	Parus cinerascens
325	527	Tit, Southern Black	Gewone Swartmees	Parus niger
326	658	Tit-babbler, Chestnut-vented	Bosveldtjerktik	Parisoma subcaeruleum
327	657	Tit-flycatcher, Grey	Waaierstertvlieevanger	Myioparus plumbeus
328	316	Turtle-dove, Cape	Gewone Tortelduif	Streptopelia capicola
329	0	Unknown, Unknown	Onbekend	N/A N/A

	Ref	Species name	Afrikaans	Taxonomic name
330	106	Vulture, Cape	Kransaasvoel	Gyps coprotheres
331	685	Wagtail, African Pied	Bontkwikkie	Motacilla aguimp
332	686	Wagtail, Cape	Gewone Kwikkie	Motacilla capensis
333	689	Wagtail, Yellow	Geelkwikkie	Motacilla flava
334	595	Warbler, Garden	Tuinsanger	Sylvia borin
335	596	Warbler, Icterine	Spotsanger	Hippolais icterina
336	607	Warbler, Marsh	Europese Rietsanger	Acrocephalus palustris
337	598	Warbler, River	Sprinkaansanger	Locustella fluviatilis
338	608	Warbler, Sedge	Europese Vleisanger	Acrocephalus schoenobaenus
339	599	Warbler, Willow	Hofsanger	Phylloscopus trochilus
340	839	Waxbill, Blue	Gewone Blousysie	Uraeginthus angolensis
341	843	Waxbill, Common	Rooibeksysie	Estrilda astrild
342	838	Waxbill, Orange-breasted	Rooiassie	Amandava subflava
343	840	Waxbill, Violet-eared	Koningblousysie	Granatina granatina
344	799	Weaver, Cape	Kaapse Wewer	Ploceus capensis
345	804	Weaver, Thick-billed	Dikbekwewer	Amblyospiza albifrons
346	797	Weaver, Village	Bonrugwewer	Ploceus cucullatus
347	568	Wheatear, Capped	Hoefeldskaapwagter	Oenanthe pileata
348	564	Wheatear, Mountain	Bergwagter	Oenanthe monticola
349	1172	White-eye, Cape	Kaapse Glasogie	Zosterops virens
350	1171	White-eye, Orange River	Gariepglasogie	Zosterops pallidus
351	594	Whitethroat, Common	Witkeelsanger	Sylvia communis
352	846	Whydah, Pin-tailed	Koningrooibekkie	Vidua macroura
353	818	Widowbird, Long-tailed	Langstertflap	Euplectes progne
354	813	Widowbird, Red-collared	Rooikeelflap	Euplectes ardens
355	814	Widowbird, White-winged	Witvlerkflap	Euplectes albonotatus
356	419	Wood-hoopoe, Green	Rooibekakelaar	Phoeniculus purpureus
357	451	Woodpecker, Bearded	Baardspeg	Dendropicus namaquus
358	446	Woodpecker, Bennett's	Bennettse Speg	Campethera bennettii
359	450	Woodpecker, Cardinal	Kardinaalspeg	Dendropicos fuscescens
360	447	Woodpecker, Golden-tailed	Goudstertspeg	Campethera abingoni
361	614	Wren-warbler, Barred	Gebande Sanger	Calamonastes fasciolatus
362	453	Wryneck, Red-throated	Draaihals	Jynx ruficollis

14.3 Threatened avifauna previously recorded within the 2528CC QDS.

	Species name	Latest Date Record (Year)	Red Data: (Regional; Global)	Taxonomic name
1	Crane, Blue	Prior to 2007	NT, VU	<i>Anthropoides paradiseus</i>
2	Duck, Maccoa	Prior to 2007	NT, NT	<i>Oxyura maccoa</i>
3	Eagle, Martial	Prior to 2007	EN, VU	<i>Polemaetu bellicosus</i>

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	Species name	Latest Date Record (Year)	Red Data: (Regional; Global)	Taxonomic name
4	Eagle, Verreaux's	Prior to 2007	VU, LC	<i>Aquila verreauxii</i>
5	Falcon, Lanner	2010	VU, LC	<i>Falco biarmicus</i>
6	Falcon, Red-footed	Prior to 2007	NT, NT	<i>Falco vespertinus</i>
7	Finfoot, African	Prior to 2007	VU, LC	<i>Podica senegalensis</i>
8	Grass-owl, African	2012	VU, LC	<i>Tyto capensis</i>
9	Kingfisher, Halfcollared	Prior to 2007	NT, LC	<i>Alcedo semitorquata</i>
10	Korhaan, Whitebellied	2016	VU, LC	<i>Eupodotis senegalensis</i>
11	Marsh-harrier, African	Prior to 2007	EN, LC	<i>Circus ranivorus</i>
12	Roller, European	2012	NT, LC	<i>Coracias garrulus</i>
13	Stork, Abdim's	2012	NT, LC	<i>Ciconia abdimii</i>
14	Stork, Black	Prior to 2007	VU, LC	<i>Ciconia nigra</i>
15	Stork, Yellow-billed	Prior to 2007	EN, LC	<i>Leptoptilos crumeniferus</i>
16	Vulture, Cape	Prior to 2007	EN, EN	<i>Gyps coprotheres</i>

15 APPENDIX D: HERPETOFAUNA LIST

15.1 Ambhians

Scientific Name	Common Name	IUCN Status
<i>Amietophrynus gutturalis</i>	Guttural Toad	Least Concern
<i>Bufo rangeri</i>	Raucous Toad	Least Concern
<i>Cacosternum boettgeri</i>	Common Caco	Least Concern
<i>Kassina senegalensis</i>	Bubbling Kassina	Least Concern
<i>Phrynobatrachus natalensis</i>	Natal Dwarf Puddle Frog	Least Concern
<i>Pyxicephalus adspersus</i>	Giant Bull Frog	Least Concern
<i>Amietia angolensis</i>	Common River Frog	Least Concern
<i>Amietia fuscigula</i>	Cape River Frog	Least Concern
<i>Schismaderma carens</i>	Red Toad	Least Concern
<i>Tomopterna cryptotis</i>	Common Sand Frog	Least Concern
<i>Tomopterna natalensis</i>	Natal Sand Frog	Least Concern
<i>Xenopus laevis</i>	Common Platanna	Least Concern

15.2 Reptile species possibly occurring within the study area

Scientific Name	Common Name	IUCN
<i>Crotaphopeltis hotamboeia</i>	Reed-lipped Herald	LC
<i>Pachydactylus affinis</i>	Transvaal Gecko	NYBA
<i>Trachylepis punctatissima</i>	Speckled Rock Skink	NYBA
<i>Boaedon capensis</i>	Brown House Snake	NYBA
<i>Trachylepis varia</i>	Variable Skink	NYBA

LC = Least concerned, NYBA = Not yet been assessed by the IUCN

15.3 Reptile species observed and/or deduced to occur

Scientific Name	Common Name	Red List Category
<i>Agama aculeata distanti</i>	Distant's Ground Agama	Least Concern
<i>Afrotyphlops bibronii</i>	Bibron's Blind Snake	Least Concern
<i>Agama atra</i>	Southern Rock Agama	Least Concern
<i>Aparallactus capensis</i>	Black-headed Centipede-eater	Least Concern
<i>Atractaspis bibronii</i>	Bibron's Stiletto Snake	Least Concern
<i>Boaedon capensis</i>	Brown House Snake	Least Concern
<i>Causus rhombeatus</i>	Rhombic Night Adder	Least Concern
<i>Chamaeleo dilepis dilepis</i>	Common Flap-neck Chameleon	Least Concern
<i>Cordylus vittifer</i>	Common Girdled Lizard	Least Concern
<i>Crotaphopeltis hotamboeia</i>	Red-lipped Snake	Least Concern
<i>Dasypeltis scabra</i>	Rhombic Egg-eater	Least Concern

Scientific Name	Common Name	Red List Category
<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated Lizard	Least Concern
<i>Hemachatus haemachatus</i>	Rinkhals	Least Concern
<i>Hemidactylus mabouia</i>	Common Tropical House Gecko	Least Concern
<i>Homoroselaps dorsalis</i>	Striped Harlequin Snake	Near Threatened
<i>Homoroselaps lacteus</i>	Spotted Harlequin Snake	Least Concern
<i>Kinixys lobatsiana</i>	Lobatse Hinged Tortoise	Least Concern
<i>Lamprophis aurora</i>	Aurora House Snake	Least Concern
<i>Leptotyphlops</i>		Not listed
<i>Leptotyphlops scutifrons conjunctus</i>	Eastern Thread Snake	Not listed
<i>Lycodonomorphus inornatus</i>	Olive House Snake	Least Concern
<i>Lycophidion capense capense</i>	Cape Wolf Snake	Least Concern
<i>Lygodactylus capensis capensis</i>	Common Dwarf Gecko	Least Concern
<i>Naja annulifera</i>	Snouted Cobra	Least Concern
<i>Pachydactylus affinis</i>	Transvaal Gecko	Least Concern
<i>Pachydactylus capensis</i>	Cape Gecko	Least Concern
<i>Panaspis wahlbergii</i>	Wahlberg's Snake-eyed Skink	Least Concern
<i>Prosymna sundevallii</i>	Sundevall's Shovel-snout	Least Concern
<i>Psammophis brevirostris</i>	Short-snouted Grass Snake	Least Concern
<i>Psammophylax rhombeatus rhombeatus</i>	Spotted Grass Snake	Least Concern
<i>Pseudaspis cana</i>	Mole Snake	Least Concern
<i>Rhinotyphlops lalandei</i>	Delalande's Beaked Blind Snake	Least Concern
<i>Trachylepis capensis</i>	Cape Skink	Least Concern

16 APPENDIX E: INVERTEBRATE SPECIES LIST

16.1 Invertebrate species list

Order	Family	Scientific Name	Common Name	IUCN 2014
Lepidoptera	Pieridae	<i>Belenois aurota</i>	Brown-veined White	NYBA
		<i>Eurema hecabe</i>	Common grass Yellow	NYBA
		<i>Beleonis creona</i>	African Common White	NYBA
	Nymphalidae	<i>Junonia hierta</i>	Yellow pansy	LC
		<i>Junonia orithya</i>	Blue Pansy	NYBA
		<i>Danaus chrysippus</i>	African Monarch	NYBA
		<i>Junonia orithya madagascariensis</i>	Eyed Pansy	NYBA
		<i>Vanessa cardui</i>	Painted Lady	NYBA
	Lycaenidae	<i>Aloeides damarensis</i>	Damara Copper	NYBA
Isoptera	Termitidae	<i>Amitermes hastatus</i>	Black-mound Termite	NYBA
Diptera	Calliphoridae	<i>Musca domestica</i>	House fly	NYBA
Orthoptera	Acrididae	<i>Heteracris Sp</i>	Sp	NYBA
		<i>Ancanthacris ruficornis</i>	Garden locust	NYBA
		<i>Oedaleus sp</i>	Yellow Wings	NYBA
	Gryllidae	<i>Gryllus bimaculatus</i>	Common garden cricket	NYBA
	Pyrgpmorphidae	<i>Phymateus morbillosus</i>	Common milkweed locust	NYBA
		<i>Ochrophlebia Sp</i>	Sp	NYBA
Hymenoptera	Apidae	<i>Apis mellifera scutellata</i>	African honey bee	NYBA
	Vespidae	<i>Belanogaster junceus</i>	Paper wasp	NYBA
	Formicidae	<i>Anoplolepis custodiens</i>	Pugnacious Ant	NYBA
Coleoptera	Coccinellidae	<i>Cheilomenes lunata</i>	Lunate Ladybird	NYBA
		<i>Harmonia axyridis</i>	Harlequin ladybird	NYBA
	Meloidae	<i>Mylabris oculata</i>	CMR Bean beetle	NYBA
	Lycidae	<i>Lycus melanurus</i>	Hook winged net winged beetle	NYBA

LC = Least concerned, NYBA = Not yet been assessed by the IUCN

16.2 Likely threatened species

Scientific Name	Common name	Red List Category
<i>Aloeides dentatis</i> subsp. <i>dentatis</i>	Roodepoort Copper Butterfly	Endangered
<i>Chrysoritis aureus</i>	Heidelberg Copper Butterfly	Endangered
<i>Lchnestoma stobbiai</i>	Stobbia's Fruit Chafer Beetle	Vulnerable
<i>Lepidochrysops praeterita</i>	Highveld Blue Butterfly	Endangered

16.3 Scorpion species list

Scientific Name	Common Name	IUCN
<i>Hadogenes gunningi</i>	Flat Rock Scorpion	NYBA
<i>Opisththalmus pugnax</i>	Burrowing Scorpion	NYBA
<i>Uroplectes triangulifer</i>	Highveld Lesser-thicktail	NYBA

LC = Least concerned, NYBA = Not yet been assessed by the IUCN

16.4 Threatened and Red Listed Invertebrate species

No IUCN Red List species were identified in the survey or from virtual museum records.