Appendix 6: Biodiversity Assessment for Kanakies Prospecting

BIODIVERSITY ASSESSMENT
KANAKIES

NORTHERN CAPE PROVINCE

June 2017

REFERENCE

Kanakies

CLIENT

Cananga Environmental

Prepared for:

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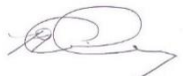
Report Name	**BIODIVERSITY ASSESSMENT KANAKIES**	
Reference	**Kanakies**	
Submitted to	**Cabanga**	
Report writer	**Peter Kimberg**	
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EXECUTIVE SUMMARY

The Biodiversity Company (TBC) was appointed to conduct a specialist biodiversity baseline assessment and impact study for a Prospecting Right Application (PRA) in the Northern Cape.

The client will be applying to prospect for Gypsum, which will involve auger drilling and trench pitting at 2 separate locations in the Northern Cape:

- PR Application 1 is situated on the Farm Kanakies 332 near Calvinia.

This report comprises the biodiversity baseline and impact assessment study for PR Application 1.

The following conclusions were reached based on the results of the desktop assessment:

- Based on the SKEP programme, the project area is situated in a very important area in terms of insect sensivity, with endemic species present. Monkey beetles, scorpions, bee flies, bees and masarid and vespid wasps all have concentrations of diversity and endemism in the Succulent Karoo biome;
- Of the plant species listed as VU, 4 are rated as moderately likely to occur in the project area;
- Of the plant species listed as NT 3 are rated as moderately likely to occur in the project area;
- Of the plant species listed as rare, 12 are rated as moderately likely to occur in the project area;
- Based on the SANBI Red List of South African Plants (2017) several South African endemic plant species are expected to occur in the project area;
- Of the 161 expected bird species:
    - Three (3) are listed as Endangered (EN) on a regional basis;
    - Six (6) species are listed as Vulnerable (VU) on a regional basis; and
    - Five (5) species are listed as Near Threatened (NT) on a regional basis.
    - On a global scale, 1 species is listed as EN, 5 and VU and 2 as NT;
    - The likelihood of occurrence of these species in the project area ranged from moderate to good;
- Of the 6 mammal species of conservation concern expected to occur in the project area, 5 were rated as highly likely to occur;

The following conclusions were reached based on the results of the field survey:

- Vegetation cover within the prospecting focus area was sparse and diversity low. This was attributed in part to the drought experienced in South Africa's winter rainfall regions for the past few seasons, along with the short duration of the survey;
- No plant species of conservation concern were recorded during the survey;

- Overall bird species diversity was low. This was attributed to the short duration of the survey. The observed bird community included 1 EN bird species namely *Neotis ludwigii* (Ludwig's bustard) which was recorded just outside of Loeriesfontein;
- Mammal diversity was low. No mammal species of conservation concern were recorded during the survey. The low mammal diversity was attributed to the short duration of the survey and the lack of intensive sampling, trapping etc.

Potential impacts associated with proposed prospecting activities were identified. These included:

- Loss destruction and/or eradication of plant species of conservation concern;
- Introduction and establishment of invasive plant species; and
- Loss and/or displacement of faunal species of conservation concern.

The results of the impact assessment were as follows:

- The significance of potential impacts of floral and faunal species of conservation concern were rated as major – negative prior to implementation of mitigation. Post-mitigation the significance of impacts was reduced to moderate - negative and minor – negative respectively;
- The significance of the potential impact of the introduction and establishment of alien invasive plant species was rated as moderate – negative prior to mitigation and minor – negative post-mitigation.

An impact statement is required as per the NEMA regulations with regards to the proposed development. Considering the above-mentioned conclusions, it is the opinion of the specialist that the project be favourably considered but that all mitigation measures should be strictly adhered to.

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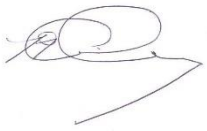
DECLARATION

I, Peter Karl Kimberg declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Peter Kimberg

B. Sc. Honours Zoology

The Biodiversity Company

9th May 2017

1 INTRODUCTION

The Biodiversity Company (TBC) was appointed by Cabanga Environmental to conduct a specialist biodiversity baseline assessment and impact study for a Prospecting Right Application (PRA) in the Northern Cape.

The client will be applying to prospect for Gypsum, which will involve auger drilling and trench pitting at 2 separate locations in the Northern Cape:

- PR Application 1 is situated on the Farm Kanakies 332 near Calvinia.

This report comprises the biodiversity baseline and impact assessment study for PR Application 1.

This report, after taking into consideration the findings and recommendation provided by the specialist herein, should inform and guide the Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making, as to the ecological viability of the proposed prospecting.

1.1 Terms of Reference

The aim of the study was to undertake and compile a biodiversity baseline and impact assessment for the proposed prospecting activities.

2 LIMITATIONS

The following limitation should be noted for the study:

- Due to the limited proposed project footprint (auger drilling and trench pitting) intensive sampling and trapping was not implemented for this study; and
- The field survey focussed primarily on the prospecting focus area.

3 KEY LEGISLATIVE REQUIREMENTS

The following legal framework and requirements apply to the study:

- The National Environmental Management: Biodiversity Act (NEM:BA) No. 10 of 2004: specifically, the management and conservation of biological diversity within the RSA and of the components of such biological diversity; and
- Succulent Karoo Ecosystem Programme (Driver et al., 2003).

4 PROJECT AREA

The project area is situated in the Northern Cape Province, on the border with the Western Cape, approximately 41 km west of Loeriesfontein. The Kanakies project area is 7478 hectares in size, with the prospecting focus area 1368 hectaters in size (Figure 1). The project

area, including the prospecting focus area, is bisected by the Transet Freight Rail – iron ore line which links the iron ore mines at Sishen to the Port at Saldanha.

The site is situated in the Western Coastal Belt ecoregion, the Berg-Olifants Water Management Area (WMA_09) and the Succulent Karroo biome. The prospecting focus area overlaps with Quarter Degree Squares (QDS) 3018DD and 3118BB whilst the larger Kanakies project area extends into QDS 3019CC and 3119AA.

The Succulent Karoo biome is one of 25 internationally recognised biodiversity hotspots, and is the world's only arid hotspot. Yet only 3.5% of the biome's 116 000 km^2 area is formally conserved, and the Succulent Karoo's biodiversity is under pressure from a range of sources.

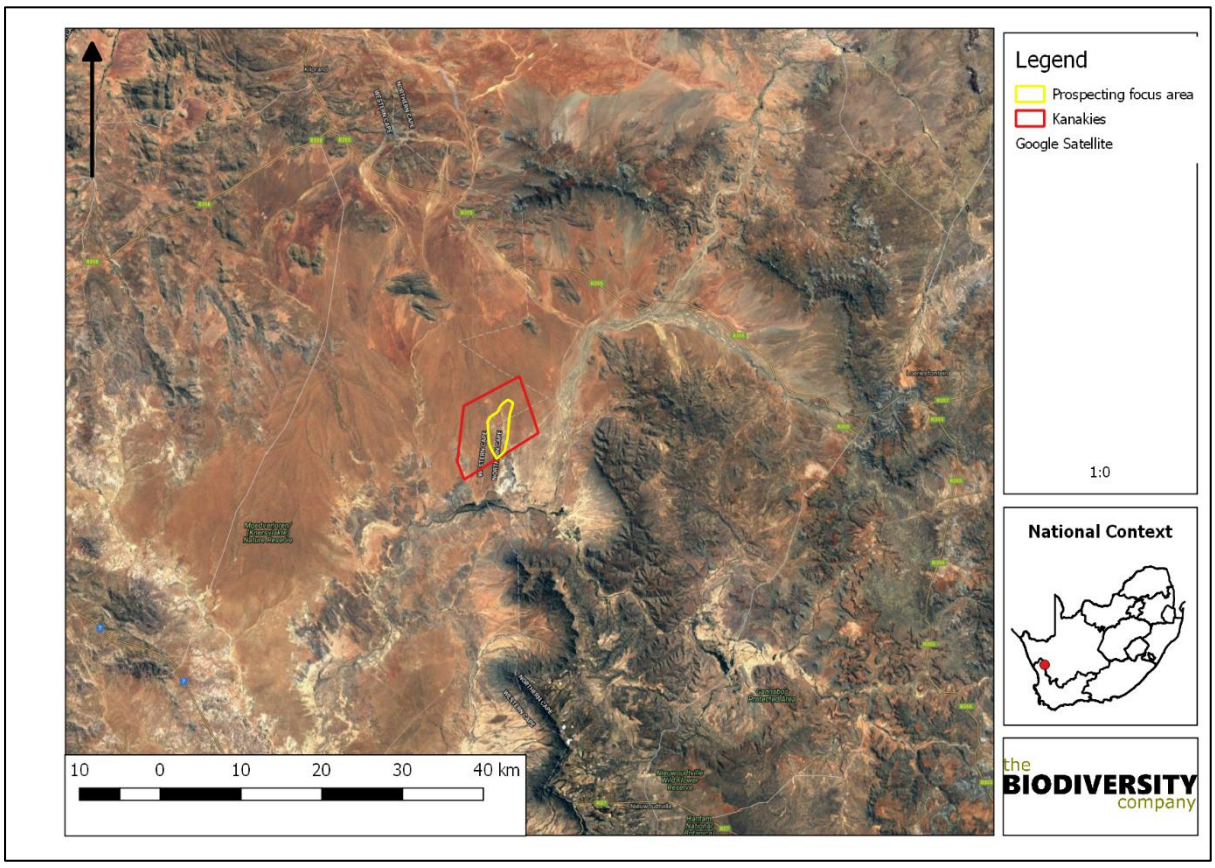


Figure 1: The location of the proposed Kanakies project area and the prospecting focus area approximately 41 km west of Loeriesfontein on the border between the Northern Cape and Western Cape Provinces

4.1 Succulent Karoo Ecosystem Programme (SKEP)

The Succulent Karoo Ecosystem Programme (SKEP) was the result of a one-year planning process which combined rigorous scientific process with broad land-user participation, to identify and generate broad consensus around a vision and a set of conservation targets for the Succulent Karoo (SANBI, 2017).

This process was initiated in September 2001 and completed in 2002 (SANBI, 2017). It was facilitated by Conservation International's (CI) Southern Africa Hotspots Programme. This formed part of Critical Ecosystem Partnership Fund's (CEPF) preparation to expand its investment to the hotspot. The team included scientific advisors and four coordinating

organizations from the region. As a result of this process, an ecosystem profile was developed for the CEPF that identified key areas for investment in the region.

The goal of the Succulent Karoo Ecosystem Plan (SKEP) is to provide an overarching framework to guide conservation efforts in the Succulent Karoo (Driver et al., 2003).

The Botanical Society of South Africa, in partnership with South Africa's National Botanical Institute (NBI), was contracted by Conservation International to undertake the Biodiversity Component of SKEP. Another partner in the Biodiversity Component of SKEP was the Institute for Plant Conservation (IPC) at the University of Cape Town. The goal of the Biodiversity Component of SKEP was to identify broad-scale geographic priorities for terrestrial biodiversity conservation in the Succulent Karoo biome, using a systematic conservation planning approach.

The SKEP Programme identified areas of sensitivity for the following components of the Succulent Karoo's biodiversity:

- Plants;
- Mammals;
- Birds;
- Reptiles;
- Amphibians; and
- Insects.

In order to assess whether the Kanakies project area overlaps with any sensitive biodiversity attributes, maps were generated showing the location of project area in relation to each of the abovementioned components. Sensitivity in this case refers to high levels of diversity and endemism.

Figure 2 shows the location of the Kanakies project area in relation to areas of known plant sensitivity. Based on this, the project area is not situated in an area of high plant endemism or sensitivity (Figure 2). The nearest area of plant sensitivity is situated approximately 13 km south of the site, near to Nieuwoudtville (Figure 2).

Figure 3 shows the location of the project area relative to areas of known mammal sensitivity. Based on this the nearest area of mammal sensitivity and importance is situated approximately 45 km west of the site (Figure 3).

Based on the SKEP maps, the nearest area of bird sensitivity is located more than 90 km from Kanakies whilest the nearest area of reptile importance is approximately 150 km from the site.

The Kanakies project area is located approximately 25 km south-east of the nearest known area of amphibian sensitivity (Figure 4). The area is known as Bitterfontein sandveld and the deep red sands are a prime breeding site for endemic frog species *Breviceps namaquensis* (Namaqua rain frog) as well as 3 other endemic frog species (Driver et al., 2003).

Based on the SKEP programme, the project area is situated in a very important area in terms of insect sensivity, with endemic species present (Figure 5). Monkey beetles, scorpions, bee

flies, bees and masarid and vespid wasps all have concentrations of diversity and endemism in the Succulent Karoo biome (Mucina & Rutherford, 2006).

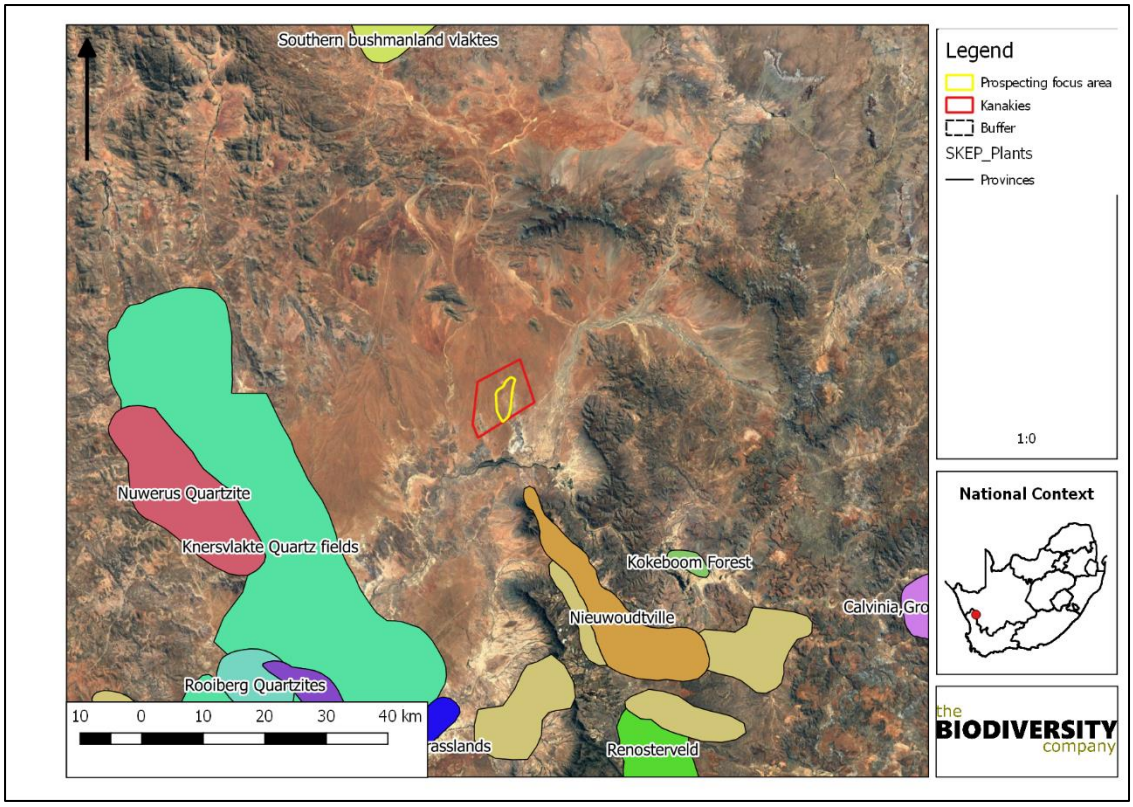


Figure 2: Location of the Kanakies project area in relation to areas of known plant sensitivity (DRIVER ET AL., 2003)

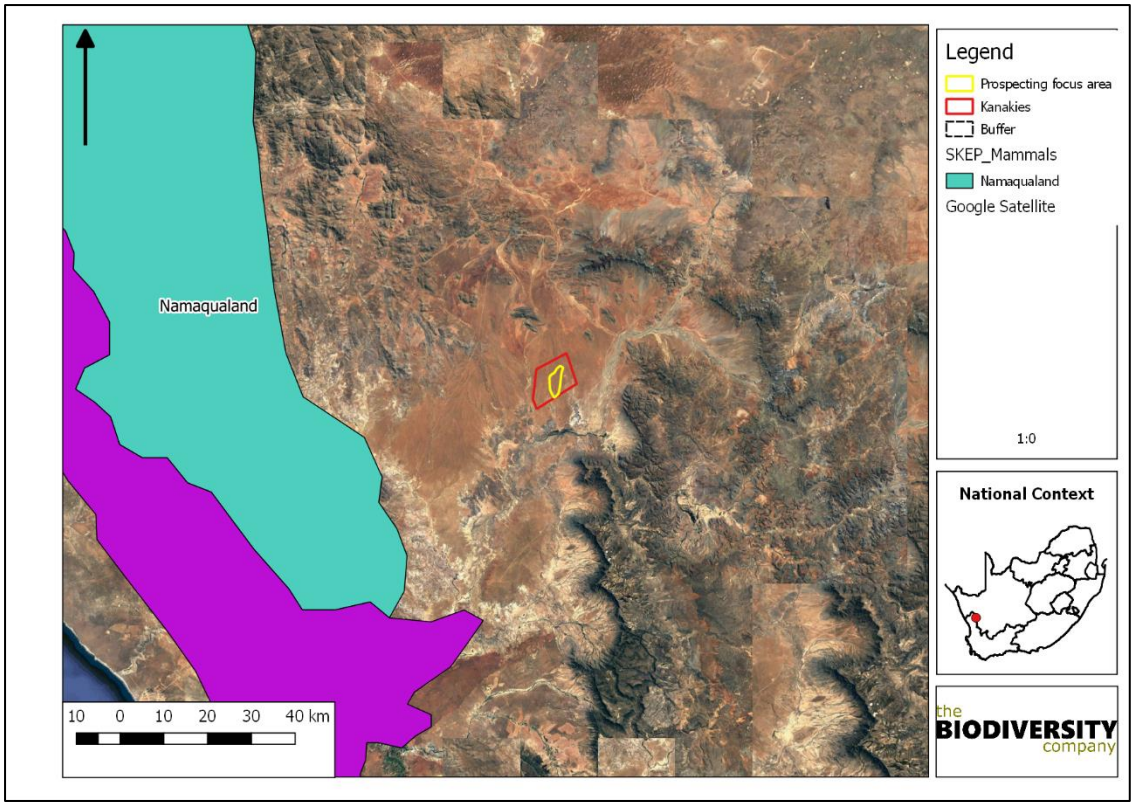


Figure 3: Location of the Kanakies project area in relation to areas of known mammal sensitivity (Driver et al., 2003)

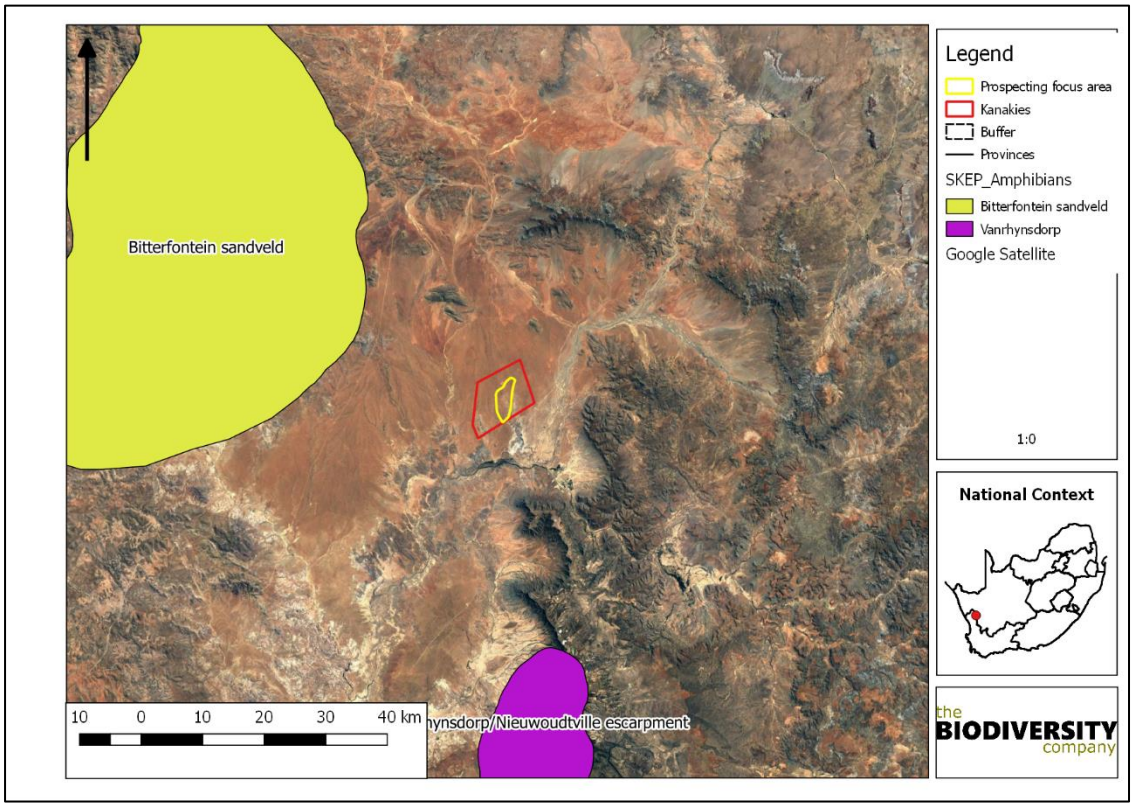


Figure 4: Location of the Kanakies project area in relation to areas of known amphibian importance & sensitivity (Driver et al., 2003)

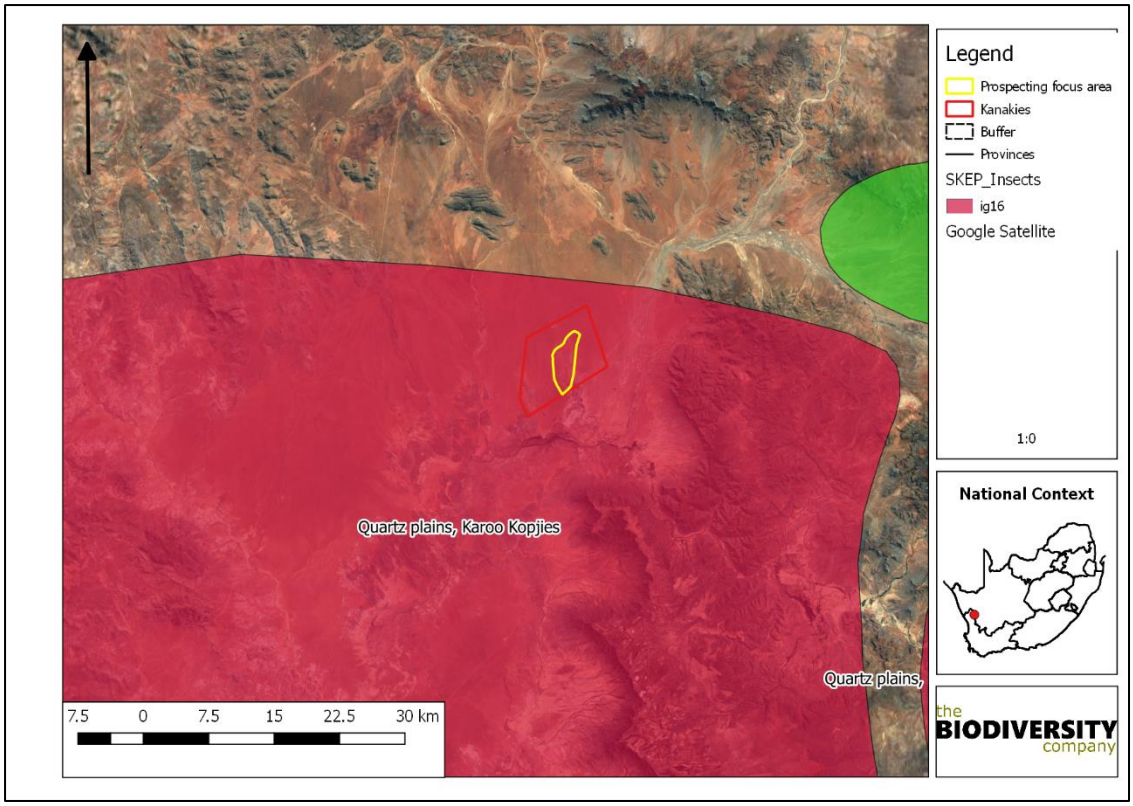


Figure 5: Location of the Kanakies project area in relation to areas of known insect importance & sensitivity (Driver et al., 2003)

4.2 C.A.P.E. FineScale Biodiversity Planning (FSP) project

The FSP project, which started in 2005, produced maps of critical biodiversity areas (CBA maps) for 9 local municipalities in the Cape Floristic Region, using a systematic biodiversity planning process. The project defined Critical Biodiversity Areas (CBAs) as those areas, terrestrial and aquatic which must be safeguarded in their natural state as they are critical for conserving biodiversity and maintaining ecosystem functioning (Ralston et al., 2009). In addition to the CBAs, the project also defined Ecological Support Areas (ESA), these are support zones which must be safeguarded as they are needed to prevent degradation of CBAs and formal protected areas (Ralston et al., 2009).

Figure 6 shows the location of the Kanakies project area in relation to terrestrial CBAs. The eastern and southern portions of the project area overlap with an ESA (Figure 6). The ESA does however not extend into the prospecting focus area (Figure 6). Two (2) Critical Biodiversity Areas (CBAs) are situated to the south of the project area (Figure 6).

The Kanakies project area does not overlap with aquatic CBAs or ESAs (Figure 7).

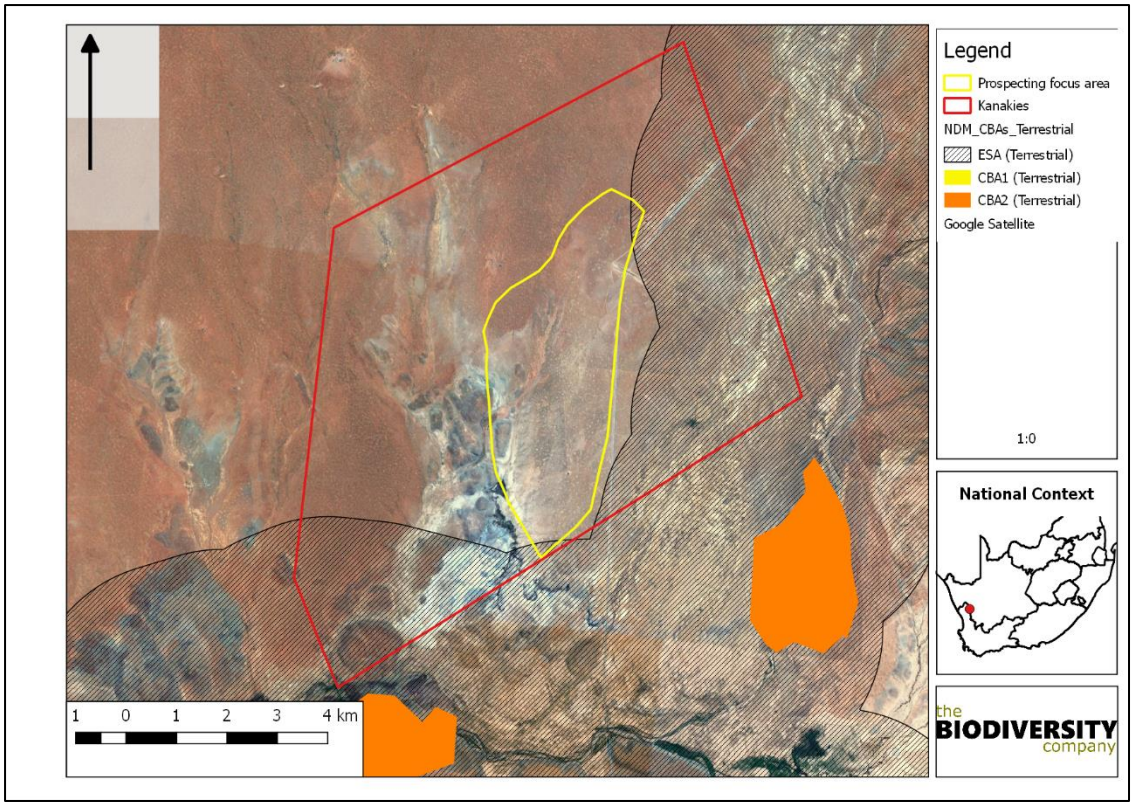


Figure 6: Terrestrial CBA map showing the location of CBA and ESA areas in relation to the Kanakies project area

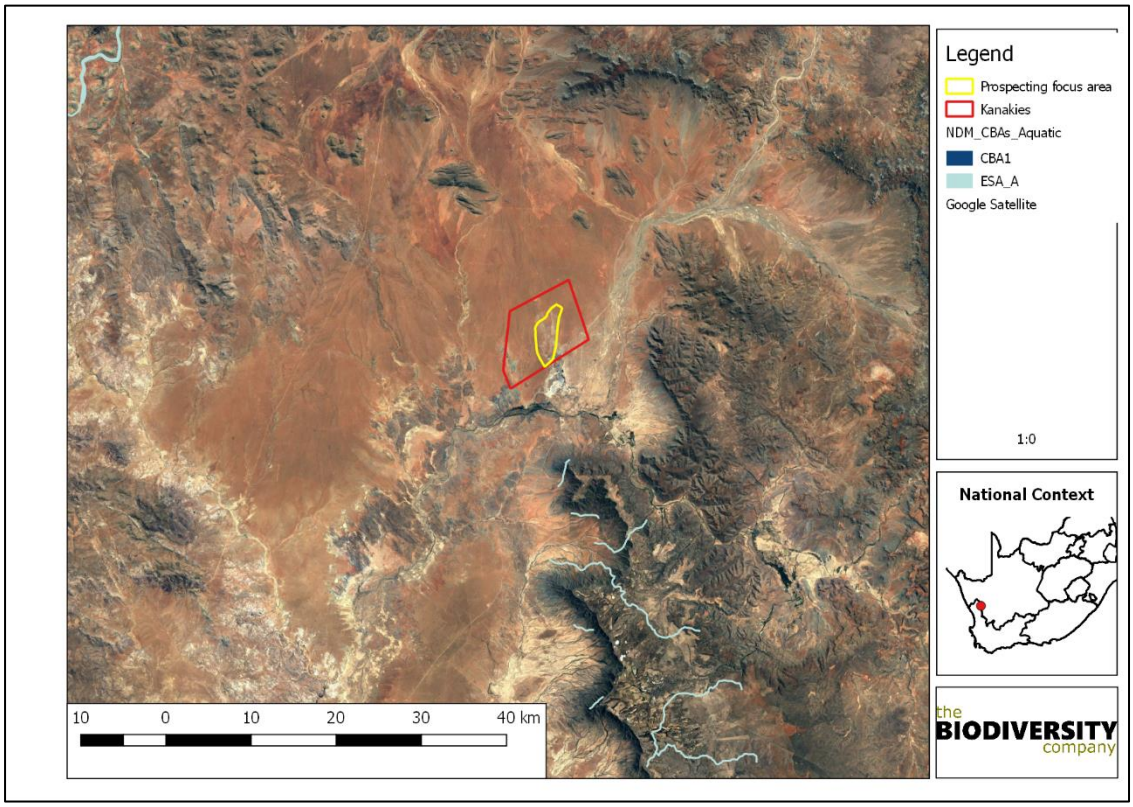


Figure 7: Aquatic CBA map showing the location of CBA and ESA areas in relation to the Kanakies project area

4.3 National Biodiversity Assessment (NBA, 2011)

The National Biodiversity Assessment (NBA) was completed as collaboration between the South African National Biodiversity Institute (SANBI), the Department of Environmental Affairs and stakeholders, scientists and biodiversity management experts throughout the country over a three-year period (Driver at al., 2012).

The purpose of the NBA is to assess the state of South Africa's biodiversity with a view to understanding trends over time and informing policy and decision-making across a range of sectors (Driver at al., 2012).

The two headline indicators assessed in the NBA are ecosystem threat status and ecosystem protection level (Driver at al., 2012). The Kanakies project area is situated in an environment which is listed as Least Threatened (LT) (Figure 8). The northern portion of the project area is categorised as poorly protected and the southern portion as not protected (Figure 9).

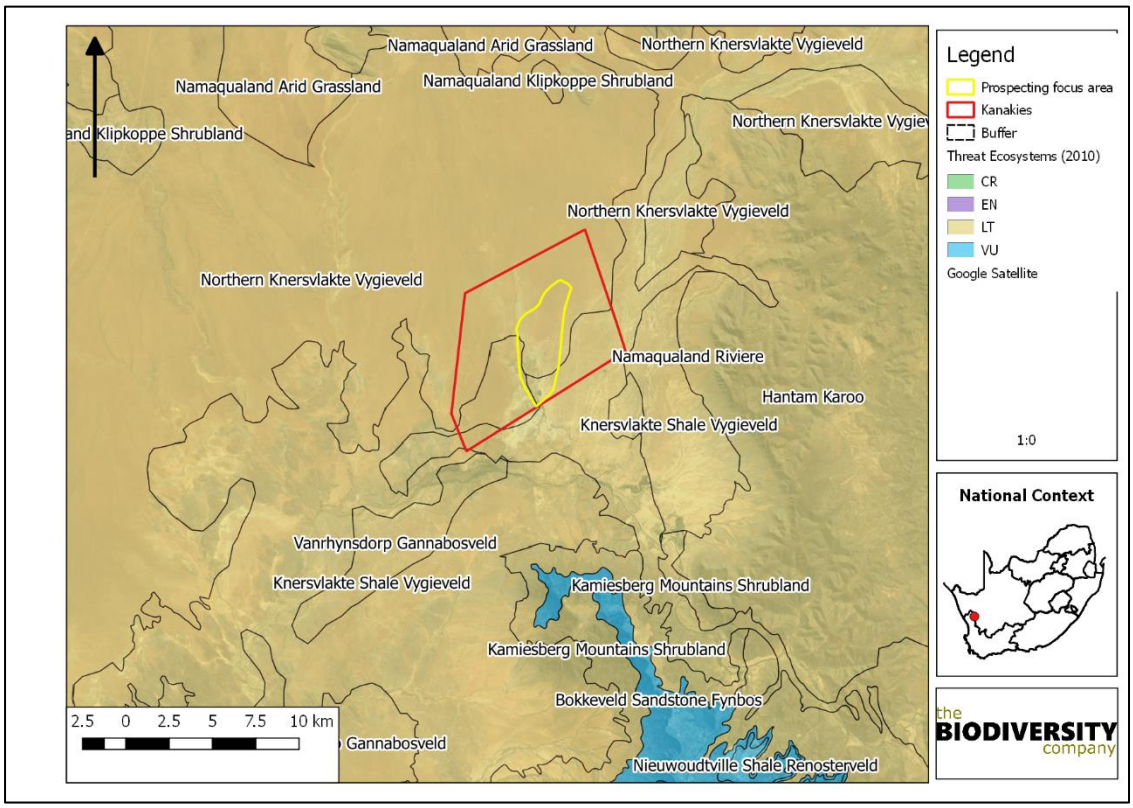


Figure 8: Threat status of the ecosystems associated with Kanakies project area (NBA, 2011)

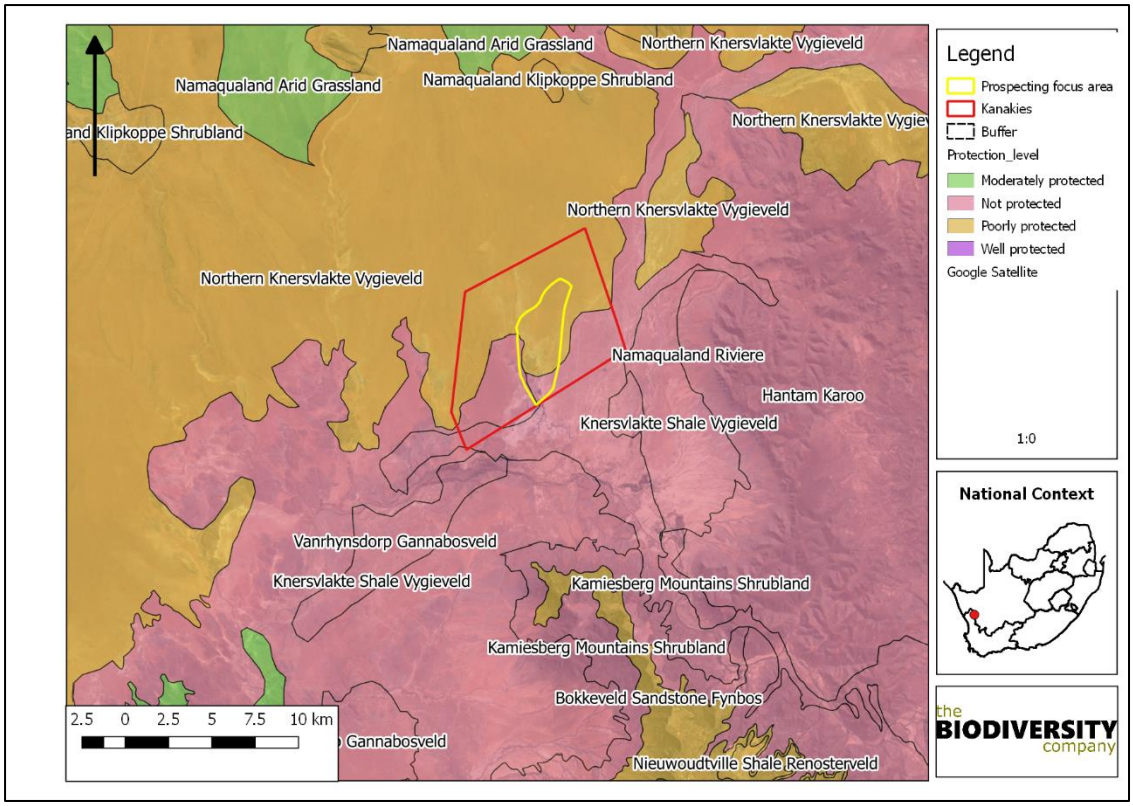


Figure 9: Protection level of the ecosystems associated with the Kanakies project area (NBA, 2011)

4.4 National Freshwater Ecosystem Priority Area (NFEPA) Status

In an attempt to better conserve aquatic ecosystems, South Africa has recently categorised its river systems according to set ecological criteria (i.e. ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs) (Driver et al. 2011) The FEPAs are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act (NEM:BA) biodiversity goals (Nel et al. 2011).

The site is situated in the catchment of the Doring River, with non-perennial tributaries that drain in a southern direction situated to the east and west of the prospecting focus area (Figure 10). The Sout River is situated to the west of the Kanakies project area and the Krom to the east (Figure 10).

Figure 11 shows the location of the Kanakies project area in relation to river FEPAs. The Sout and Krom rivers are both listed as non-FEPA drainages (Figure 11).

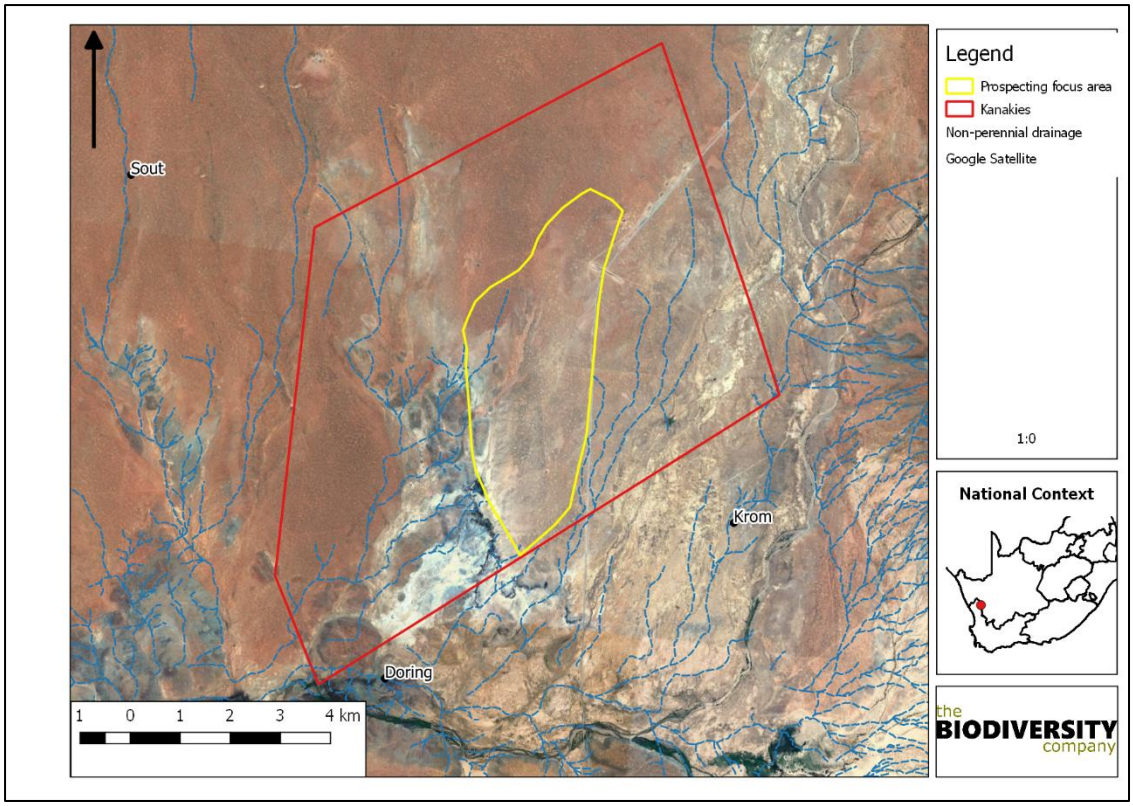


Figure 10: Drainage lines associated with the Kanakies project area

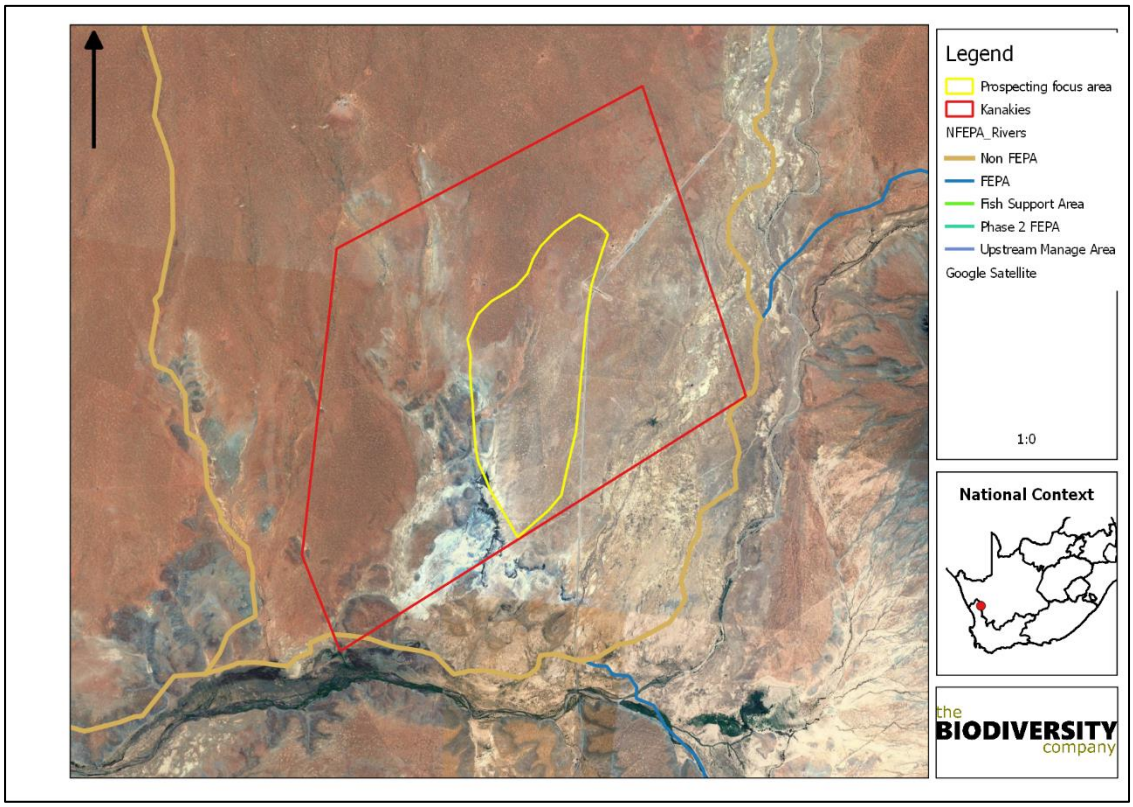


Figure 11: Kanakies project area in relation to river FEPAs

Figure 12 shows the location of the project area in relation to the wetland FEPAs. Based on the wetland FEPA map, there are some small non-FEPA wetlands within the Kanakies project area, however these wetlands are not within 500 m of the prospecting focus area (Figure 12).

Based on the location of the Kanakies project area in relation to aquatic and wetland FEPAs, it can be concluded that prospecting activities are unlikely to impact on any priority areas.

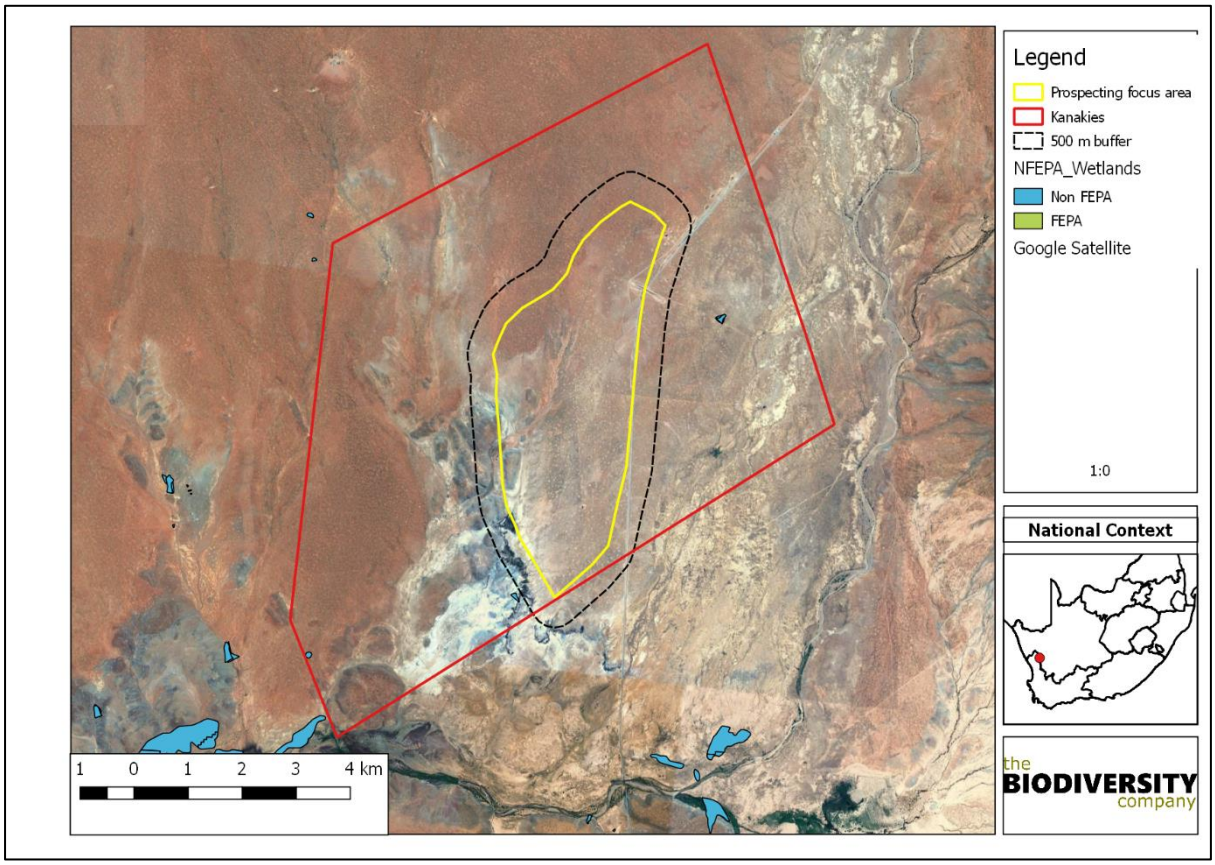


Figure 12: Kanankies project area in relation to wetland FEPAs

4.5 Protected Areas

Formally protected areas refer to areas protected either by national or provincial legislation whereas informally protected areas refers to privately owned reserves. Figure 13 shows the location of formally protected areas in relation to the project area.

The Moedverloren Nature Reserve is situated approximately 20 km west of the project area and the proposed prospecting activities are very unlikely to impact on this reserve (Figure 13).

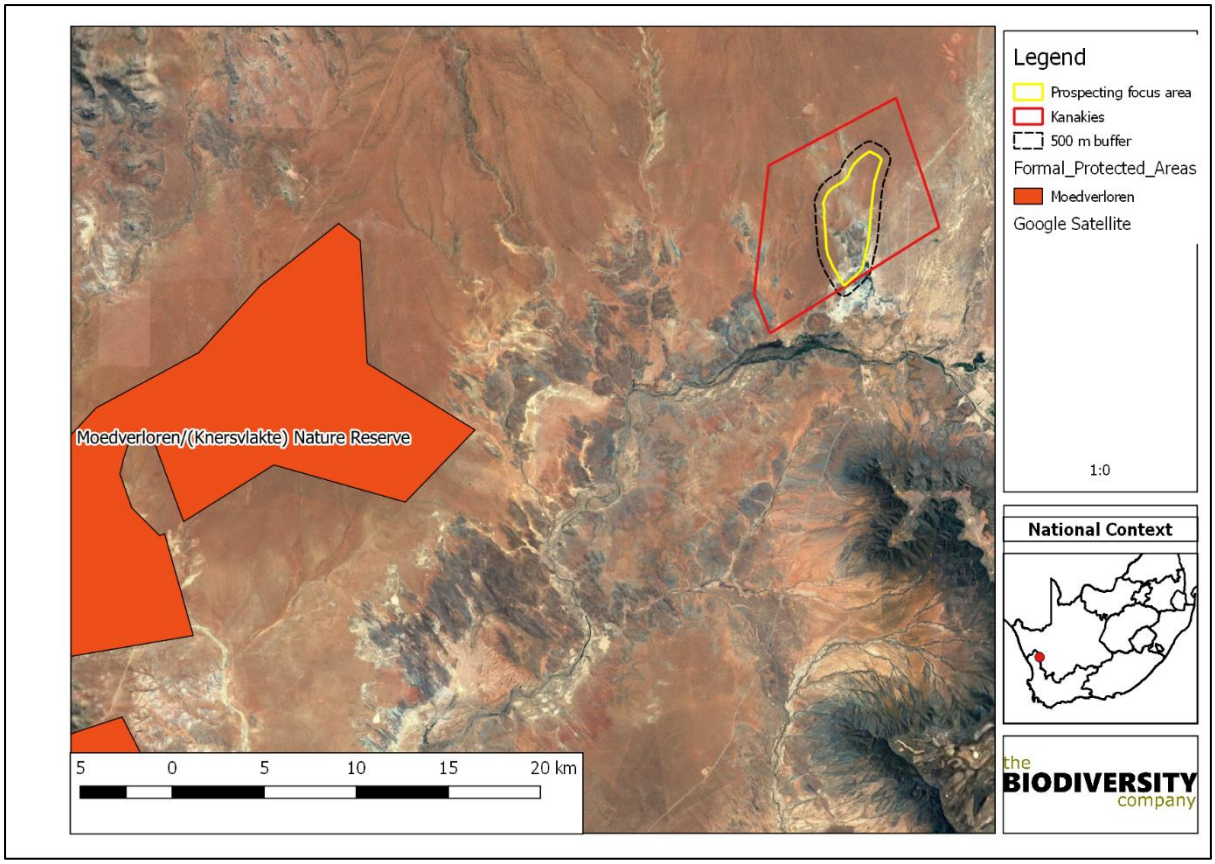


Figure 13: Formally protected areas in relation to the Kanakies project area

5 METHODOLOGY

5.1 Desktop Assessment

The requirements of this assessment served to combine aspects of the regional vegetation community (obtained from Mucina and Rutherford 2006) with the field study in order to formulate a series of conclusions and subsequent recommendations. The following datasets and sources were reviewed for the study:

- The Vegetation of South Africa, Lesotho & Swaziland (Mucina & Rutherford, 2006);
- The Southern Africa Bird Atlas Project (SABAP2, 2017) and BirdLife South Africa website (2017);
- Mammal information was referenced from the Animal Demography Unit (ADU, 2017), Skinner & Chimimba (2005) and the IUCN spatial database (IUCN, 2017); and
- Reptiles and amphibians were referenced from ADU (2017), Bates et al. (2014), Du Preez and Carruthers (2009) and the IUCN spatial database (IUCN, 2017) respectively.

The evaluation of species of concern was considered after the field study which served to identify their potential for occurrence. Therefore, all species identified under the above-

mentioned references were not necessarily analysed in detail. Plants were identified using Van Oudtshoorn (2004) and Van Wyk & Van Wyk (1997).

The verification of the presence of red and orange listed plant species was one of the primary ecological requirements of the floral assessment.

5.2 Field Survey

A field survey was conducted on the 22nd March 2017 by an ecologist where the floral and faunal communities in the project area were assessed. The timing of the study represented late wet-season conditions. The project area was ground-truthed in a vehicle and on foot, which included spot checks in pre-selected areas to validate desktop data. Photographs were recorded during the site visit.

The fieldwork attempted to classify the fauna, flora and habitats, with emphasis on recording the actual and potential presence of Red Data species (also referred to as Red-Listed and Orange-Listed species), which are species of conservation concern in South African (either classified as threatened by the IUCN (2017), protected by NEMBA (2014) or indeed other legislations applicable provincially or nationally).

5.2.1 Vegetation Assessment

The survey included the following:

- A survey for Red and Orange Data plant species;
- Vegetation units will be identified, classified and delineated;
- Habitat types will be classified and delineated;
- The survey will be conducted in consultation with local authorities who have information to be considered; and
- The survey area will include terrestrial ecosystems within 500 m of the prospecting focus area.

5.2.2 Faunal Assessment

The survey included the following:

- Compilation of expected species lists;
- A survey of the terrestrial habitats within the proposed development area (where applicable);
- Compilation of identified species lists;
- Identification of any Red Data or listed species present or potentially occurring in the area;
- A proximity assessment to any protected or ecologically important areas;
- Emphasis will be placed on the probability of occurrence of species of provincial, national and international conservation importance.

6 RESULTS & DISCUSSION

6.1 Desktop Assessment

6.1.1 Vegetation Assessment

The Kanakies project area is situated in the Succulent Karoo biome (Figure 14). Globally there are few other places that are as biologically distinct as the Succulent Karoo biome (Mucina & Rutherford, 2006). The biome stretches in an interrupted belt from Luderitz in Namibia to the Little Karoo in the interior of the Western Cape (Mucina & Rutherford, 2006).

The Succulent Karoo is a semidesert region, with a strong maritime influence, characterised by an even, mild climate (Mucina & Rutherford, 2006). The biome is home to 6356 plant species of which 26% are strict endemics and a further 14% are near endemics (Mucina & Rutherford, 2006). The vegetation is characterised by dwarf leaf-succulent shrubs (1700 species) (Mucina & Rutherford, 2006). Perennials and geophytes are also prominent (Mucina & Rutherford, 2006).

The largest portion of the project area and prospecting focus area is situated in Northern Knersvlakte vygieveld (SKk1) (Figure 15). In the south and east of the Kanakies project area and prospecting focus area the vegetation communities transition to Krensvlakte shale vygieveld (SKk4) and Namaqualand Riviere (AZi1) (Figure 15).

6.1.1.1 Northern Knersvlakte vygieveld (SKk1)

This vegetation community occurs on a slightly undulating landscape which is covered with open canopy succulent shrubs (Mucina & Rutherford, 2006). Most of this vegetation community occurs in the Western Cape Province, with the area to the west of Loeriesfontein, which includes the project area being the only portion of this community in the Northern Cape Province (Mucina & Rutherford, 2006). This vegetation community was classified as Least threatened by Mucina & and Rutherford (2006) as although none is statutorily conserved it remains largely untransformed.

6.1.1.2 Krensvlakte shale vygieveld (SKk4)

This vegetation community is characterised by low shrubland formed by mat-forming and cushion-forming shrubs, mainly with succulent leaves and a high incidence of spinescence (Mucina & Rutherford, 2006). *Ruschia* and *Salsola* are the dominant genera (Mucina & Rutherford, 2006). This vegetation community was classified as Least threatened by Mucina and Rutherford (2006). About 5% is statutorily conserved in Moedverloren nature reserve. Past impacts include grazing by goats and prospecting for diamonds and gypsum (Mucina & Rutherford, 2006).

6.1.1.3 Namaqualand Riviere (AZi1)

This vegetation community occurs along dry riverbeds throughout Namaqualand (Mucina & Rutherford, 2006). This community comprises alluvial shrubs and patches of tussock graminoids (herb-like plants) in river beds and banks (Mucina & Rutherford, 2006). Low thickets of *Vachellia karroo* and *Tamarix usneoides* can also sometimes be found (Mucina & Rutherford, 2006). This vegetation was classified as Least threatened by Mucina & Rutherford (2006) with a very small portion statutorily conserved and almost 20% already transformed.

Impacts include transformation for vineyards, construction of dams and enchroachment by alien invasive vegetation (Mucina & Rutherford, 2006).

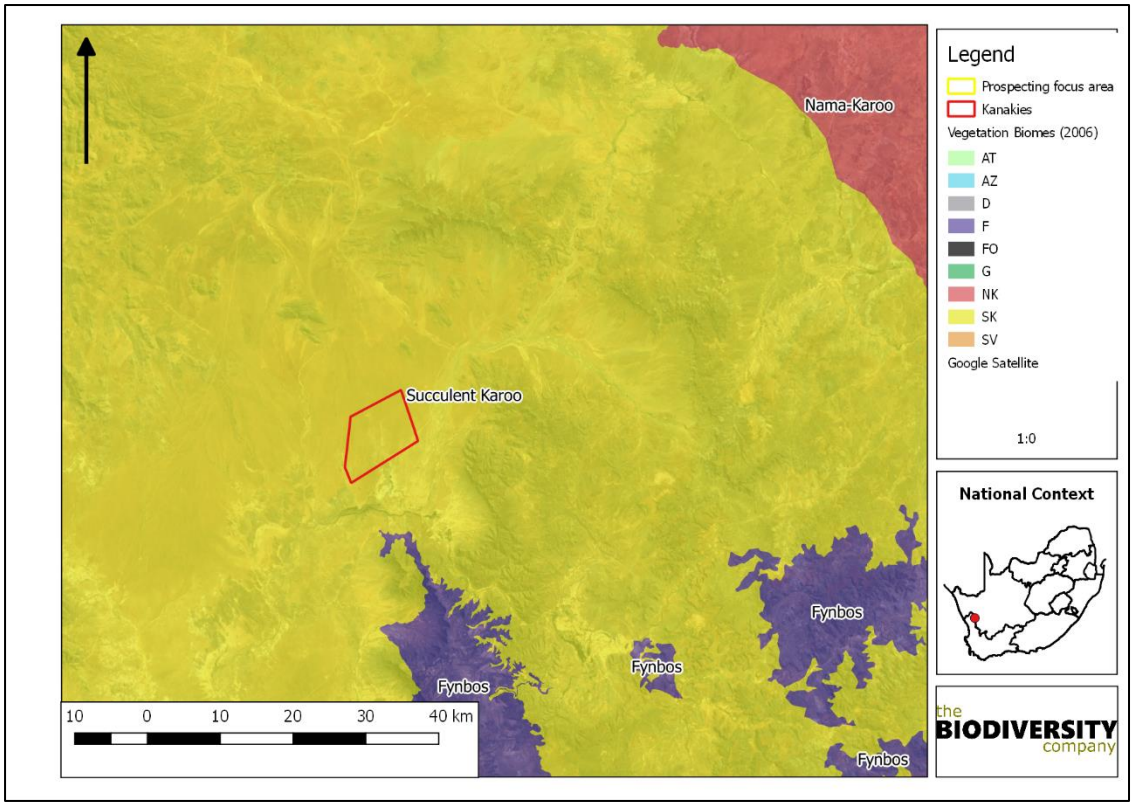


Figure 14: Location of the Kanakies project area within the Succulent Karoo biome

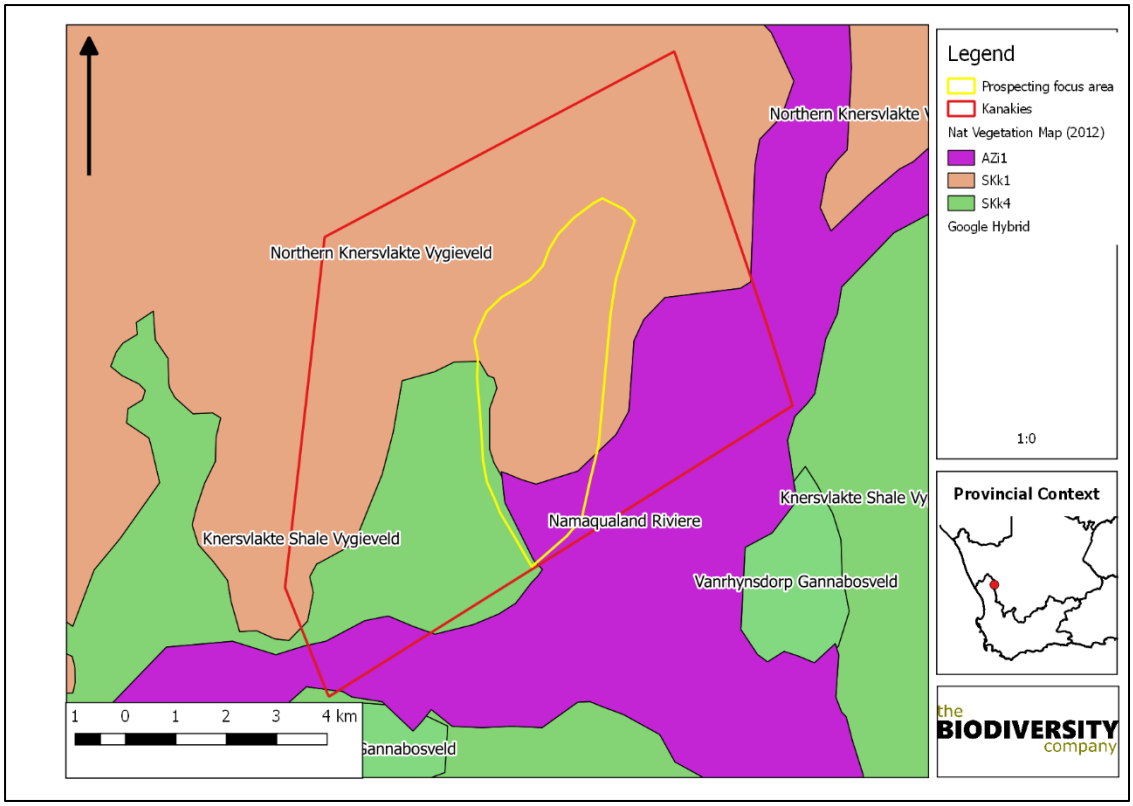


Figure 15: Kanakies project area showing the different vegetation communities (Mucina & Rutherford, 2006)

6.1.1.4 Plant Species of Conservation Concern

A list of plant species of conservation concern was compiled based on the POSA database (POSA, 2017). Of the 535 plant species expected to occur in the Quarter Degree Squares that overlap with the Kanakies project area, 48 (9.2%) are listed as being on conservation concern (Table 1). Of these, 4 species are listed as Endangered (EN) on the SANBI Red List of South African Plants (2017) (Table 1). A further 16 species are listed as Vulnerable (VU) and 9 as Near threatened (NT) (Table 1).

The likelihood of occurrence of the plant species of conservation concern was assessed based on the habitats and ecology of each plant species as per the SANBI Red List of South African Plants (2017). Plant species that are listed as endemic to fynbos vegetation communities were rated as unlikely to occur in the project area (Table 1). Plant species that occur in the Succulent Karoo biome but in vegetation communities other than those overlapping with the project area were rated as low likelihood (Table 1). Plant species that are known to occur in those vegetation communities that are known to occur in the project area were rated as moderately likely (Table 1).

The 4 EN plant species are discussed below, with emphasis placed in the likelihood of occurrence in the Kanakies project area.

Babiana sambucina is endemic to the Fynbos vegetation communities growing on the Bokkeveld Plateau around Nieuwoudtville (SANBI, 2017). It is therefore highly unlikely to occur in the project area.

Corycium ingeanum occurs at a few locations in the Nieuwoudtville Shale Renosterveld vegetation community and is unlikely to occur in the project area (SANBI, 2017).

Serruria fucifolia in another species which is endemic to the fynbos vegetation communities around Nieuwoudtville and further towards the West Coast (SANBI, 2017). This species is unlikely to occur in the project area.

Xiphotheca reflexa is fynbos endemic which is unlikely to occur in the project area (SANBI, 2017).

Of the plant species listed as VU, 4 are rated as moderately likely to occur in the project area (Table 1). Of the plant species listed as NT 3 are rated as moderately likely to occur in the project area (Table 1). Of the plant species listed as rare, 12 are rated as moderately likely to occur in the project area (Table 1).

Based on the SANBI Red List of South African Plants (2017) all 48 of these plants are South African endemics (Table 1).

Table 1: Plant species of conservation concern expected to occur in QDS 3018DD, 3019CC, 3118BB and 3119AA as well as the conservation status of each (POSA, 2017; SANBI, 2017)

Species	Threat status	SA Endemic	Likelihood of Occurrence
Babiana sambucina (Jacq.) Ker Gawl. subsp. longibracteata (G.J.Lewis) Goldblatt & J.C.Manning	EN	Yes	Unlikely
Corycium ingeanum E.G.H.Oliv.	EN	Yes	Unlikely
Serruria fucifolia Salisb. ex Knight	EN	Yes	Unlikely
Xiphotheca reflexa (Thunb.) A.L.Schutte & B.-E.van Wyk	EN	Yes	Unlikely
Aloe buhrii Lavranos	VU	Yes	Moderate
Anacampseros comptonii Pillans	VU	Yes	Unlikely
Cephalophyllum pulchellum L.Bolus	VU	Yes	Moderate
Cotula pedunculata (Schltr.) E.Phillips	VU	Yes	Unlikely
Euphorbia fasciculata Thunb.	VU	Yes	Moderate
Gladiolus lapeirousioides Goldblatt	VU	Yes	Low
Leucospermum rodolentum (Salisb. ex Knight) Rourke	VU	Yes	Unlikely
Moraea aspera Goldblatt	VU	Yes	Unlikely
Oxalis dines Ornduff	VU	Yes	Low
Phylica cuspidata Eckl. & Zeyh. var. cuspidata	VU	Yes	Unlikely
Phyllobolus congestus (L.Bolus) Gerbaulet	VU	Yes	Low
Satyrium pulchrum S.D.Johnson & Kurzweil	VU	Yes	Low
Sparaxis tricolor (Schneev.) Ker Gawl.	VU	Yes	Low
Strumaria aestivalis Snijman	VU	Yes	Low

Species	Threat status	SA Endemic	Likelihood of Occurrence
Strumaria massoniella (D.& U.Müll.-Doblies) Snijman	VU	Yes	Moderate
Tylecodon nolteei Lavranos	VU	Yes	Low
Othonna intermedia Compton	NT	Yes	Low
Babiana vanzijliae L.Bolus	NT	Yes	Unlikely
Lachenalia barkeriana U.Müll.-Doblies, B.Nord. & D.Müll.-Doblies	NT	Yes	Moderate
Leucadendron loranthifolium (Salisb. ex Knight) I.Williams	NT	Yes	Unlikely
Lithops divergens L.Bolus	NT	Yes	Moderate
Oedera multipunctata (DC.) Anderb. & K.Bremer	NT	Yes	Unlikely
Oxalis senecta T.M.Salter	NT	Yes	Moderate
Stapelia paniculata Willd. subsp. paniculata	NT	Yes	Unlikely
Strumaria perryae Snijman	Critically Rare	Yes	Low
Antimima nordenstamii (L.Bolus) H.E.K.Hartmann	Rare	Yes	Low
Argyroderma subalbum (N.E.Br.) N.E.Br.	Rare	Yes	Moderate
Argyroderma theartii Van Jaarsv.	Rare	Yes	Moderate
Babiana pilosa G.J.Lewis	Rare	Yes	Low
Bulbine fallax Poelln.	Rare	Yes	Moderate
Bulbine fragilis G.Will.	Rare	Yes	Low
Bulbine wiesei L.I.Hall	Rare	Yes	Moderate
Cephalophyllum staminodiosum L.Bolus	Rare	Yes	Moderate
Crassula multiceps Harv.	Rare	Yes	Moderate
Drosanthemum ramosissimum (Schltr.) L.Bolus	Rare	Yes	Moderate
Ferraria ovata (Thunb.) Goldblatt & J.C.Manning	Rare	Yes	Moderate
Gethyllis gregoriana D.Müll.-Doblies	Rare	Yes	Moderate
Gethyllis lata L.Bolus subsp. lata	Rare	Yes	Moderate
Lachenalia kliprandensis W.F.Barker	Rare	Yes	Low
Moraea fenestrata (Goldblatt) Goldblatt	Rare	Yes	Unlikely
Phyllobolus chrysophthalmus Gerbaulet & Struck	Rare	Yes	Low
Tylecodon tenuis (Toelken) Bruyns	Rare	Yes	Moderate
Ursinia pygmaea DC.	Rare	Yes	Moderate
Dioscorea elephantipes (L'Hér.) Engl.	Declining	Yes	Good

6.1.2 Faunal Assessment

6.1.2.1 Avifauna

Four hundred and thirty-one bird species (379 genera, 92 families, 25 orders) have been recorded in the Succulent Karoo biome according to the SKEP analysis (DRIVER ET AL., 2003).

Based on the SAPAB2 database (2017) 161 bird species are expected to occur in the pentads that overlap the project area (3100_1855, 3100_1900, 3055_1900, 3055_1855, 3055_1850). The full list of potential bird species is provided in Appendix B. Of the expected bird species 15 (9.3%) are listed as being of conservation concern either regionally or globally (Table 2) (ESKOM, 2014; IUCN, 2017).

The expected bird species list includes:

- Three (3) species that are listed as Endangered (EN) on a regional basis;
- Six (6) species that is listed as Vulnerable (VU) on a regional basis; and
- Five (5) species that are listed as Near Threatened (NT) on a regional basis (Table 2).

On a global scale, 1 species is listed as EN, 5 and VU and 2 as NT (Table 2).

Table 2: List of bird species of regional or global conservation importance that are expected to occur in pentads 2355_2925 and 2400_2925 (SABAP2, 2017, ESKOM, 2014; IUCN, 2017)

Species	Common Name	Conservation Status		Likelihood of occurence
		Regional (Eskom, 2016	Global (IUCN, 2017)	
Circus maurus	Harrier, Black	EN	VU	Moderate
Neotis ludwigii	Bustard, Ludwig's	EN	EN	Good
Polemaetus bellicosus	Eagle, Martial	EN	VU	Low
Afrotis afra	Korhaan, Southern Black	VU	VU	Good
Aquila verreauxii	Eagle, Verreaux's	VU	LC	Good
Ciconia nigra	Stork, Black	VU	LC	Low
Cursorius rufus	Courser, Burchell's	VU	LC	Good
Falco biarmicus	Falcon, Lanner	VU	LC	Good
Sagittarius serpentarius	Secretarybird	VU	VU	Good
Anthropoides paradiseus	Crane, Blue	NT	VU	Low
Calendulauda barlowi	Lark, Barlow's	NT	Unlisted	Low
Certhilauda brevirostris	Lark, Agulhas Long-billed	NT	Unlisted	Low
Eupodotis vigorsii	Korhaan, Karoo	NT	LC	Good
Oxyura maccoa	Duck, Maccoa	NT	NT	Low
Calidris ferruginea	Sandpiper, Curlew	Unlisted	NT	Low

Polemaetus bellicosus (Martial eagle) is listed as EN on a regional scale and VU on a global scale (Table 2). This species has an extensive range across much of sub-Saharan Africa but populations are declining due to deliberate and incidental poisoning, habitat loss, reduction in available prey, pollution and collisions with power lines (IUCN, 2017). It inhabits open woodland, wooded savanna, bushy grassland, thornbush and, in southern Africa, more open country and even subdesert (IUCN, 2017). Based on the expected habitat the likelihood of occurrence of this species is considered to be low, no records exist of this species in any of the pentads over the period July 2007 to May 2017 (SABAP, 2017).

Circus maurus (Black harrier) is endemic to southern Africa, where it is concentrated in the Western Cape (IUCN, 2017). It is a cool, dry-country species, frequenting coastal and montane fynbos, highland grasslands, Karoo subdesert scrub, open plains with low shrubs and croplands (IUCN, 2017). Despite a huge distributional range, population sizes are very small and have decreased by 85% over the past 100 years due primarily to habitat loss (IUCN, 2017). Although no records exist of this species in the project area, the habitat is suitable and therefore the likelihood of occurrence is rated as moderate.

Neotis ludwigii (Ludwig's bustards) has a large distributional range centred on the dry biomes of the Karoo and Namib in southern Africa (IUCN, 2017). This species is classified as Endangered both regionally and globally as the population has undergone a very rapid population decline due to collisions with power lines (IUCN, 2017). This species inhabits open lowland and upland plains with grass and light thornbush, sandy open shrub veld and semi-desert in the arid and semi-arid Namib and Karoo biomes (IUCN, 2017). Although very few (*n=2*) records exist of this species in pentads, the habitat in the project area are suitable and the likelihood of occurrence is good.

6.1.2.2 Mammals

The IUCN Red List Spatial Data (IUCN, 2017) lists 53 mammal species that could be expected to occur within the project area. Of these, *Diceros bicornis* (Black rhinoceros) and *Ceratotherium simum* (Southern white rhino) are conservation dependant species that in South Africa only occur in protected areas such as game reserves. These species were omitted from the expected species list resulting in an expected mammal list of 51 species (Appendix C). Of the 51 expected mammal species, 6 (11.8%) are listed as species of conservation concern either regionally or globally (Table 3).

The list of potential species includes 2 species that are are listed as VU and 4 that are listed as NT on a regional scale (Table 3). On a global scale, 2 species are listed as VU and none as NT (Table 3).

Of the 6 mammal species of conservation concern, 5 were are rated as highly likely to occur in the project area (Table 3). The only exception is *Panthera pardus* (Leopard) which, according the IUCN (2017) is extinct in the project area although it remains extant with close proximity. It was therefore rated as having a low likelihood of occurrence (Table 3).

Table 3: List of mammal species of conservation concern that may occur in the project area as well as their global and regional conservation statuses (IUCN, 2017; SANBI, 2017)

Species	Common name	Conservation Status		Likelihood of Occurence
		Regional (SANBI, 2016)	IUCN (2017)	
Felis nigripes	Black-footed Cat	VU	VU	High
Panthera pardus	Leopard	VU	VU	Low
Graphiurus ocularis	Spectacled Dormouse	NT	LC	High
Parotomys littledalei	Littledale's Whistling Rat	NT	LC	High
Pelea capreolus	Grey Rhebok	NT	LC	High
Poecilogale albinucha	African Striped Weasel	NT	LC	High

6.1.2.3 Herpetofauna (reptiles & amphibians)

Based on the IUCN Red List Spatial Data (IUCN, 2017) and the ReptileMap database provided by the Animal Demography Unit (ADU, 2017) 9 reptile species are expected to occur in the project area (Appendix D). No species of conservation concern are expected to occur in the project area.

Based on the IUCN Red List Spatial Data (IUCN, 2017) and the AmphibianMap database provided by the Animal Demography Unit (ADU, 2017) 5 amphibian species are expected to occur in the project area, none of which are listed as being of conservation concern (Appendix D).

6.2 Field Survey

6.2.1 Vegetation Assessment

At the time of the survey, vegetation cover within the prospecting focus area was sparse and diversity low (Figure 16). The sparse vegetation cover was attributed in part to the drought experienced in South Africa's winter rainfall regions for the past few seasons, along with the short duration of the survey. A list of plant species recorded during the survey is provided in Table 4.

Figure 16: Sparse vegetative cover within the prospecting focus area at the time of the March 2017 survey

A total of 11 plant species were recorded in the prospecting focus area during the March 2017 survey (Table 4). None of the expected plant species of conservation concern were recorded during the survey (Table 4).

Table 4: Plant species recorded in the Kanakies prospecting focus area

Species	Threat status (SANBI, 2017)	SA Endemic (SANBI, 2017)
Amellus microglossus DC.	LC	No
Brownanthus vaginatus (Lam.) Chess. & M.Pignal	LC	No
Cephalophyllum framesii L.Bolus	LC	No
Didelta carnosa (L.f.) Aiton var. carnosa	LC	No
Hoodia gordonii (Masson) Sweet ex Decne.	DD	No
Lampranthus uniflorus (L.Bolus) L.Bolus	LC	No
Ruschia spinosa	LC	No
Salsola decussata C.A.Sm. ex Botsch.	LC	No
Stoeberia frutescens (L.Bolus) Van Jaarsv.	LC	No

6.2.2 Faunal Assessment

6.2.2.1 Avifaunal Assessment

A total of 18 bird species (11.2% of expected) were recorded during the March 2017 survey (Table 5). Due to the limited duration of the field survey, and the ability of birds to move large distances in a short space of time, relative to most mammals, herpetofauna or insects, bird species that were recorded on the drive from Loeriesfontein to the site were also included in the assessment. The observed bird community included 1 EN bird species namely *Neotis ludwigii* (Ludwig's bustard) (Table 5). This species was observed near to Loeriesfontein.

A photograph of the *N. ludwigii* observed during the March 2017 survey is provided in Figure 17.

The low species diversity was attributed primarily to the limited duration of the survey.

Table 5: Bird species recorded during the March 2017 survey

Species	Common Name	Conservation Status	
		Regional (Eskom, 2016	Global (IUCN, 2017)
Alopochen aegyptiacus	Goose, Egyptian	Unlisted	LC
Calendulauda albescens	Lark, Karoo	Unlisted	LC
Cercomela schlegelii	Chat, Karoo	Unlisted	LC
Chersomanes albofasciata	Lark, Spike-heeled	Unlisted	LC
Corvus albus	Crow, Pied	Unlisted	LC
Corvus capensis	Crow, Cape	Unlisted	LC
Falco rupicoloides	Kestrel, Greater	Unlisted	LC
Falco rupicolus	Kestrel, Rock	Unlisted	Unlisted

Species	Common Name	Conservation Status	
		Regional (Eskom, 2016	Global (IUCN, 2017)
Lanius collaris	Fiscal, Common (Southern)	Unlisted	LC
Malcorus pectoralis	Warbler, Rufous-eared	Unlisted	LC
Melierax canorus	Goshawk, Southern Pale Chanting	Unlisted	LC
Motacilla capensis	Wagtail, Cape	Unlisted	LC
Neotis ludwigii	Bustard, Ludwig's	EN	EN
Passer melanurus	Sparrow, Cape	Unlisted	LC
Spreo bicolor	Starling, Pied	Unlisted	LC
Streptopelia capicola	Turtle-dove, Cape	Unlisted	LC
Streptopelia senegalensis	Dove, Laughing	Unlisted	LC
Vanellus armatus	Lapwing, Blacksmith	Unlisted	LC

Figure 17: *Neotis ludwigii* (Ludwig's bustard) observed near to Loeriesfontein during the March 2017 survey

6.2.2.2 Mammals

Due to the similarity of habitat and the relative proximity, mammal species that were observed on the drive between Loeriesfontein were also included in this assessment. Four (4) mammal species were observed during the March 2017 survey (Table 6).

No mammal species of conservation concern were recorded during the survey. The low mammal diversity was attributed to the short duration of the survey and the lack of intensive sampling, trapping etc.

Table 6: Mammal species observed during the March 2017 survey

Species	Common name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
Canis mesomelas	Black-backed Jackal	LC	LC
Lepus saxatilis	Scrub Hare	LC	LC
Procavia capensis	Rock Hyrax	LC	LC
Raphicerus campestris	Steenbok	LC	LC

6.2.2.3 Herpetofauna (reptiles & amphibians)

No reptiles or amphibians were observed on the site during the March 2017 survey. The absence of reptiles and amphibians was attributed to the short duration of the survey. With more detailed and thorough assessments numerous species are expected as listed in Appendix D.

7 IMPACT ASSESSMENT

7.1 Methodology

Potential impacts were evaluated against the data captured during the fieldwork to identify relevance to the study area. The relevant impacts were then subjected to a prescribed impact assessment methodology.

Impacts were assessed in terms of the prospecting activities which is assessed as comprising a temporary activity but with a potential long-term impact.

Mitigation measures were only applied to impacts deemed relevant based on the impact analysis. Impacts were assessed in terms of probability and consequence. The probability descriptor is presented in Table 7. The consequence descriptors are presented in Table 7 and Table 8.

Table 7: Probability descriptors

Description	Rating
Certain	7
Highly probable	6
Likely	5
Probable	4
Unlikely	3

Improbable	2
Highly unlikely	1

Table 8: Consequence Descriptors

Duration	Rating
Permanent	7
Beyond project life	6
Project Life	5
Long term	4
Medium term	3
Short term	2
Immediate	1
Extent	**Rating**
International	7
National	6
District	5
County	4
Local	3
Site-specific	2
Very limited	1
Type x Intensity	**Rating**
Extremely high - negative	-7
Very high - negative	-6
High - negative	-5
Moderately high - negative	-4
Moderate - negative	-3
Low - negative	-2
Very low - negative	-1
Negligible	0
Very low - positive	1
Low - positive	2
Moderate - positive	3
Moderately high - positive	4
High - positive	5
Very high - positive	6
Extremely high - positive	7

7.2 Identification of Impacts

Impacts associated with proposed prospecting activities were identified. These included:

- Loss destruction and/or eradication of plant species of conservation concern;
- Introduction and establishment of invasive plant species; and
- Loss and/or displacement of faunal species of conservation concern.

7.3 Assessment of Significance

7.3.1 Loss of plant species of conservation concern

Although no plant species of conservation concern were recorded during the field survey, the likelihood of occurrence of several species was rated as moderate and 1 species as good (Table 1).

Table 9 shows the significance of potential impacts associated with the proposed prospecting activities on plant species of conservation concern before and after implementation of mitigation measures. Prior to implementation of mitigation measures the significance of impacts were rated as major - negative (Table 9). Implementation of mitigation measures reduced the significance of potential impact on plant species of conservation concern to moderate - negative (Table 9).

Table 9: Assessment of significance of potential impacts on plants species of conservation concern (pre- and post- mitigation)

<table>
<tr><td colspan="5">IMPACT DESCRIPTION: Loss of plant species of conservation concern</td></tr>
<tr><td>Predicted for project phase:</td><td></td><td>Prospecting</td><td></td><td></td></tr>
<tr><td>Dimension</td><td>Rating</td><td colspan="3">Motivation</td></tr>
<tr><td colspan="5">PRE-MITIGATION</td></tr>
<tr><td>Duration</td><td>Permanent (7)</td><td>Permanent detsruction of plant species of conservation concern</td><td rowspan="3">Consequence: Extremely detrimental (-20)</td><td rowspan="4">Significance: Major - negative (-120)</td></tr>
<tr><td>Extent</td><td>International (7)</td><td>Loss of SA endemic plant species</td></tr>
<tr><td>Intensity x type of impact</td><td>Very high - negative (-6)</td><td>Loss of plant species with limited extent of occurrence</td></tr>
<tr><td>Probability</td><td>Highly probable (6)</td><td colspan="2">Construction of roads and clearing of project footprint</td></tr>
<tr><td colspan="5">MITIGATION:
- Prior to vegetation clearing a detailed botanical assessment needs to be conducted of each project footprint in a wet season period
- If plant species of conservation concern are located these must either be relocated or avoided
- Revegetate areas that were cleared once prospecting is completed</td></tr>
<tr><td colspan="5">POST-MITIGATION</td></tr>
</table>

Duration	Permanent (7)	Loss of plant species of conservation concern is permanent	Consequence: Extremely detrimental (-18)	Significance: Moderate - negative (-90)
Extent	International (7)	As for pre-mitigation		
Intensity x type of impact	Moderately high - negative (-4)	Mitigation measures will reduce the intensity and amount of topsoil that is lost		
Probability	Likely (5)	Unlikely that all plant species of conservation concern can be located and rescued		

7.3.2 Introduction and establishment of invasive plant species

During the survey, relatively few alien invasive plant species were recorded in the area. This can be attributed to the remoteness of the area and the lack of disturbance. Although the habitat is disturbed along the railway track and the adjoining service road, a short distance from there the habitat is largely intact. The clearing of existing vegetation for access roads and drill rigs along with heavy machinery entering the area creates the potential for the introduction of alien invasive plant species into the area. Over time alien invasive plant species may begin to encroach beyond the footprint of the prospecting areas into the surrounding habitats, competing with indigenous vegetation and crowding out plant species of conservation concern.

The significance of this impact was rated as moderate – negative prior to implementation of mitigation (Table 10). Implementation of mitigation measures reduced the significance the impact to minor – negative (Table 10).

Table 10: Assessment of significance of introduction and establishment of alien invasive vegetation into the project area (pre- and post- mitigation)

IMPACT DESCRIPTION: Introduction and establishment of alien invasive plant species				
Predicted for project phase:		Prospecting		
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				
Duration	Permanent (7)	Once alien invasive species have become established they will be a permanent feature of the landscape without direct intervention	Consequence: Highly detrimental (-15)	Significance: Moderate - negative (-90)

Extent	Local (3)	Alien invasive species will most likely become establised in project footprint but may also encroach on surrounding areas		
Intensity x type of impact	High - negative (-5)	Encroachment of alien invasive plant species may result in the disappearance of indigenous plant species of conservation concern		
Probability	Highly probable (6)	Unless mitigation measures are implemented the likelihood of introduction of invasive plant species is highly probable		

MITIGATION:

- Prior to any heavy machinary entering the site it must be thoroughly cleaned and checked to avoid introduction of soil and seeds
- Rehabilitation of each site after construction
- Monitoring of site to assess rehabilitation success and to manage introduced alien invasives

POST-MITIGATION

Duration	Beyond project life (6)	As for pre-mitigation	Consequence: Moderately detrimental (-11)	Significance: Minor - negative (-44)
Extent	Local (3)	As for pre-mitigation		
Intensity x type of impact	Low - negative (-2)	Mitigation will maximise local job creation		
Probability	Probable (4)	Implementation of mitigation measures will reduce the likelihood of establishment of alien invasive species		

7.3.3 Loss of displacement of faunal species of conservation concern

Although only a single bird species of conservation concern was recorded during the survey, the likelihood of other species of conservation concern occurring on the site was rated as moderate to good (Table 2, Table 3). Prospecting will be a short-term activity, but the potential exists for long-term impacts, particularly the displacement and loss of habitat of species with very limited distributional ranges, catholic habitat requirements and small populations sizes. Species may return to the sites once the disturbance associated with prospecting is removed, but habitats may be altered.

The significance of potential impacts on faunal species of conservation concern was rated as major – negative prior to implementation (Table 11). Implementation of mitigation measures reduced the significance of the impacts to minor – negative (Table 11).

Table 11: Assessment of significance of potential impacts on faunal species of conservation concern (pre- and post- mitigation)

IMPACT DESCRIPTION: Loss and or displacement of faunal species of conservation concern				
Predicted for project phase:		Construction		
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				
Duration	Beyond project life (6)	Any fauna species of conservation concern will likely only return to the site post completion of rehabilitation	Consequence: Extremely detrimental (-19)	Significance: Major - negative (-114)
Extent	International (7)	Confirmed presence of species of global conservation concern		
Intensity x type of impact	Very high - negative (-6)	Confirmed presence of species of global conservation concern		
Probability	Highly probable (6)	Proposed prospecting activities may result in the loss of habitat of faunal species of national and global conservation concern contributing to further pressure on populations of these species		
MITIGATION:				
- Prior to clearing of each site a detailed faunal survey must be conducted of each proposed prospecting site to assess the presence of faunal species of conservation concern - If any faunal species are present in the project footprint species impact assessments need to be conducted and mitigation measures implemented which may include avoidance - All project staff need to be educated about the potential sensitivity of faunal species on the site				
POST-MITIGATION				
Duration	Long term (4)	Avoidance of key habitats will reduce the period of displacement of faunal species	Consequence: Highly detrimental (-15)	Significance: Minor - negative (-60)
Extent	International (7)	As for pre-mitigation		
Intensity x type of impact	Moderately high - negative (-4)	Mitigation will reduce the significance of potential impacts		
Probability	Probable (4)	Mitigation measures will reduce the likelihood that faunal species of conservation concern will be displaced		

7.4 Potential mitigation measures

The focus of mitigation measures should be to reduce the significance of potential impacts associated with the development and thereby to:

- Prevent the loss of floral species of conservation concern and the introduction and establishment of alien invasive species; and
- Prevent the loss or displacement of faunal species of conservation concern and to prevent the further reduction of faunal biodiversity.

7.4.1 Mitigation Measures for Impacts on Vegetation Communities

Recommended mitigation and rehabilitation measures include the following:

- Areas that are denuded during prospecting need to be re-vegetated with indigenous vegetation to avoid creating an entry point for invasive plant species;
- Prior to any roads or prospecting sites being cleared a detailed botanical assessment needs to be conducted in order to confirm that no sensitive plant species are present on the site. If such plant species are recorded on the site then mitigation measures need to be implemented which may include relocation or avoidance;
- Prior to any heavy machinery entering the site they need to be thoroughly cleaned in order to prevent the introduction the foreign organic matter including the seeds of alien invasive plant species
- Compilation of and implementation of an alien vegetation management plan for the entire site.

7.4.2 Mitigation Measures for Impacts on Faunal Communities

Recommended mitigation and rehabilitation measures include the following:

- Once proposed prospecting areas have been identified these areas, along with the surrounding habitats, need to be thoroughly assessed for the presence of sensitive faunal species. If faunal species of conservation importance are recorded on the site then a species-specific impact assessment must be undertaken and appropriate mitigation measures identified;
- If any faunal species of conservation importance are recorded during prospecting, activities should temporarily cease and an appropriate specialist should be consulted to identify the correct course of action;
- Staff should be educated about the sensitivity of faunal species. The intentional killing of any animals including snakes, lizards, birds or other animals should be strictly prohibited.

8 CONCLUSIONS

The following conclusions were reached based on the results of the desktop assessment:

- Based on the SKEP programme, the project area is situated in a very important area in terms of insect sensivity, with endemic species present. Monkey beetles, scorpions, bee flies, bees and masarid and vespid wasps all have concentrations of diversity and endemism in the Succulent Karoo biome;
- Of the plant species listed as VU, 4 are rated as moderately likely to occur in the project area;
- Of the plant species listed as NT 3 are rated as moderately likely to occur in the project area;
- Of the plant species listed as rare, 12 are rated as moderately likely to occur in the project area;
- Based on the SANBI Red List of South African Plants (2017) several South African endemic plant species are expected to occur in the project area;
- Of the 161 expected bird species:
    - Three (3) are listed as Endangered (EN) on a regional basis;
    - Six (6) species are listed as Vulnerable (VU) on a regional basis; and
    - Five (5) species are listed as Near Threatened (NT) on a regional basis.
    - On a global scale, 1 species is listed as EN, 5 and VU and 2 as NT;
    - The likelihood of occurrence of these species in the project area ranged from moderate to good;
- Of the 6 mammal species of conservation concern expected to occur in the project area, 5 were rated as highly likely to occur;

The following conclusions were reached based on the results of the field survey:

- Vegetation cover within the prospecting focus area was sparse and diversity low. This was attributed in part to the drought experienced in South Africa's winter rainfall regions for the past few seasons, along with the short duration of the survey;
- No plant species of conservation concern were recorded during the survey;
- Overall bird species diversity was low. This was attributed to the short duration of the survey. The observed bird community included 1 EN bird species namely *Neotis ludwigii* (Ludwig's bustard) which was recorded just outside of Loeriesfontein;
- Mammal diversity was low;
- No mammal species of conservation concern were recorded during the survey.
- The low mammal diversity was attributed to the short duration of the survey and the lack of intensive sampling, trapping etc.

Potential impacts associated with proposed prospecting activities were identified. These included:

- Loss destruction and/or eradication of plant species of conservation concern;
- Introduction and establishment of invasive plant species; and
- Loss and/or displacement of faunal species of conservation concern.

The significance of potential impacts of floral and faunal species of conservation concern were rated as major – negative prior to implementation of mitigation. Post-mitigation the significance of impacts was reduced to moderate - negative and minor – negative respectively;

The significance of the potential impact of the introduction and establishment of alien invasive plant species was rated as moderate – negative prior to mitigation and minor – negative post-mitigation.

9 IMPACT STATEMENT

An impact statement is required as per the NEMA regulations with regards to the proposed development.

Considering the above-mentioned conclusions, it is the opinion of the specialist that the project be favourably considered but that all mitigation measures should be strictly adhered to.

10 REFERENCES

ADU (Animal Demography Unit). 2017. Virtual Museum. Available at http://vmus.adu.org.za/ (Accessed in March 2016)

Bates, M.F., Branch, W.R., Bauer, A.M., Burger, M., Marais, J., Alexander, G.J. & De Villiers, M.S. (EDS). 2014. Atlas and Red List of the Reptiles of South Africa, Lesotho and Swaziland. Suricata 1. South African National Biodiversity Institute, Pretoria, South Africa.

Driver, A., Desmet, P., Rouget, M., Cowling, R., and Maze, K. 2003. Succulent Karoo Ecosystem Plan BIODIVERSITY COMPONENT - TECHNICAL REPORT. Cape Conservation Unit, Report No CCU 1/03, Botanical Society of South Africa

Driver, A., J.L. Nel, K. Snaddon, K. Murray, D.J. Roux, L. Hill, E.R. Swartz, J. Manual, and N. Funke. 2011. Implementation manual for freshwater ecosystem priority areas. WRC Report No. 1801/1/11. Pretoria: Water Research Commission.

Du Preez, L.H. & Carruthers, V. 2009. A complete guide to the frogs of southern Africa. Random House Struik, Cape Town.

DWAF: The Regulations on the National Forests Act of 1998 (Act No. 84 of 1998) – published 29 April 2009 in the Government Gazette under the auspices of the Department of Water Affairs and Forestry (DWAF).

DWS (Department of Water and Sanitation) (2014). A Desktop Assessment of the Present Ecological State, Ecological Importance and Ecological Sensitivity per Sub Quaternary Reaches for Secondary Catchments in South Africa. Draft. Compiled by RQS-RDM.

EWT (Endangered Wildlife Trust). 2017. Threatened Amphibian Programme. Available at https://www.ewt.org.za/TAP/refrence.html

FrogMap 2015. The Southern African Frog Atlas Project (SAFAP, now FrogMAP). http://vmus.adu.org.za (Accessed in March 2017)

Hockey, P.A.R., Dean, W.R.J. & Ryna, P.G. (eds.) 2005. Roberts – Birds of Southern Africa, VIIth ed. The Trustees of the John Voelker Bird Book Fund, Cape Town.

IUCN, 2017. The IUCN Red List of Threatened Species. Available at www.iucnredlist.org (Accessed in March 2017).

Mucina, L. and Rutherford, M.C. (Eds.) 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelizia 19. South African National Biodiversity Institute, Pretoria South African Bird Atlas Project (SABAP2). 2012. http://vmus.adu.org.za/

Nel JL, Murray KM, Maherry AM, Petersen CP, Roux DJ, Driver A, Hill L, Van Deventer H, Funke N, Swartz ER, Smith-Adao LB, Mbona N, Downsborough L and Nienaber S. 2011. Technical Report for the National Freshwater Ecosystem Priority Areas project. WRC Report No. K5/1801.

Ralston, S., de Villiers, C., Manuel, J., te Roller, K. 2009. Where are we going? Fine scale systematic conservation plans and their contribution to environmental assessment.

South African National Biodiversity Institute (SANBI). 2017. Species Status Database. http://www.speciesstatus.sanbi.org/default.aspx

South African Bird Atlas Project (SABAP2). 2017. Available at http://vmus.adu.org.za/

Skinner J.D. & Chimimba, C.T. 2005. The Mammals of the Southern African Subregion (New Edition). Cambridge University Press. South Africa.

Van Oudtshoorn F. 2004. Gids tot die grasse van Suider-Afrika. Second Edition. Pretoria. Briza Publikasies

Van Wyk, B and Van Wyk, P. 1997. Field guide to trees of Southern Africa. Cape Town. Struik Publishers

APPENDIX A: EXPECTED PLANT SPECIES

Species	Threat status	SA Endemic
Strumaria perryae Snijman	Critically Rare	No
Acacia karroo Hayne	LC	No
Adenogramma glomerata (L.f.) Druce	LC	No
Adenogramma mollugo Rchb.f.	LC	No
Adromischus filicaulis (Eckl. & Zeyh.) C.A.Sm. subsp. filicaulis	LC	No
Adromischus marianiae (Marloth) A.Berger var. marianiae	LC	No
Albuca villosa U.Müll.-Doblies subsp. villosa	Not Evaluated	No
Aloe buhrii Lavranos	VU	No
Aloe glauca Mill.	LC	No
Aloe variegata L.	LC	No
Amellus microglossus DC.	LC	No
Anacampseros comptonii Pillans	VU	No
Anacolia breutelii (Schimp. ex Müll.Hal.) Magill var. squarrifolia (Sim) Magill	Not Evaluated	No
Anisodontea bryoniifolia (L.) Bates	LC	No
Anthospermum dregei Sond. subsp. dregei	LC	No
Anthospermum spathulatum Spreng. subsp. spathulatum	LC	No
Antimima dualis (N.E.Br.) N.E.Br.	LC	No
Antimima evoluta (N.E.Br.) H.E.K.Hartmann	LC	No
Antimima intervallaris (L.Bolus) H.E.K.Hartmann	LC	No
Antimima longipes (L.Bolus) Dehn	LC	No
Antimima maleolens (L.Bolus) H.E.K.Hartmann	LC	No
Antimima nordenstamii (L.Bolus) H.E.K.Hartmann	Rare	No
Antimima papillata (L.Bolus) H.E.K.Hartmann	LC	No
Antimima solida (L.Bolus) H.E.K.Hartmann	LC	No
Antimima tuberculosa (L.Bolus) H.E.K.Hartmann	LC	No
Antimima watermeyeri (L.Bolus) H.E.K.Hartmann	LC	No
Antizoma miersiana Harv.	LC	No
Aptosimum spinescens (Thunb.) Emil Weber	LC	No
Arctotis aspera L. var. aspera	LC	No
Arctotis erosa (Harv.) Beauverd	LC	No
Arctotis fastuosa Jacq.	LC	No
Arctotis leiocarpa Harv. x A. fastuosa Jacq.	Not Evaluated	No
Arenifera spinescens (L.Bolus) H.E.K.Hartmann	LC	No
Argyroderma crateriforme (L.Bolus) N.E.Br.	LC	No

Argyroderma delaetii C.A.Maass	LC	No
Argyroderma fissum (Haw.) L.Bolus	LC	No
Argyroderma subalbum (N.E.Br.) N.E.Br.	**Rare**	No
Argyroderma theartii Van Jaarsv.	**Rare**	No
Aridaria noctiflora (L.) Schwantes subsp. defoliata (Haw.) Gerbaulet	LC	No
Aridaria noctiflora (L.) Schwantes subsp. noctiflora	LC	No
Aridaria noctiflora (L.) Schwantes subsp. straminea (Haw.) Gerbaulet	LC	No
Aridaria serotina L.Bolus	LC	No
Aristida adscensionis L.	LC	No
Aristida dasydesmis (Pilg.) Mez	LC	No
Aspalathus quinquefolia L. subsp. hispida (Thunb.) R.Dahlgren	LC	No
Asparagus asparagoides (L.) Druce	LC	No
Asparagus fasciculatus Thunb.	LC	No
Asparagus striatus (L.f.) Thunb.	LC	No
Athanasia pachycephala DC. subsp. pachycephala	LC	No
Athanasia trifurcata (L.) L.	LC	No
Atriplex semibaccata R.Br. var. typica Aellen	Not Evaluated	No
Atriplex suberecta I.Verd.	LC	No
Augea capensis Thunb.	LC	No
Avonia albissima (Marloth) G.D.Rowley	LC	No
Avonia quinaria (E.Mey. ex Fenzl) G.D.Rowley subsp. quinaria	LC	No
Babiana crispa G.J.Lewis	LC	No
Babiana flabellifolia Harv. ex Klatt	LC	No
Babiana pilosa G.J.Lewis	**Rare**	No
Babiana sambucina (Jacq.) Ker Gawl. subsp. longibracteata (G.J.Lewis) Goldblatt & J.C.Manning	**EN**	No
Babiana spathacea (L.f.) Ker Gawl.	LC	No
Babiana vanzijliae L.Bolus	**NT**	No
Ballota africana (L.) Benth.	LC	No
Barbula indica (Hook.) Spreng.	Not Evaluated	No
Bergia glomerata L.f.	LC	No
Berkheya fruticosa (L.) Ehrh.	LC	No
Blepharis furcata (L.f.) Pers.	LC	No
Blepharis macra (Nees) Vollesen	LC	No
Blepharis pruinosa Engl.	Not Evaluated	No
Braunsia maximilianii (Schltr. & A.Berger) Schwantes	LC	No

Brownanthus vaginatus (Lam.) Chess. & M.Pignal	LC	No
Brunsvigia bosmaniae F.M.Leight.	LC	No
Brunsvigia comptonii W.F.Barker	LC	No
Bryobartramia novae-valesiae (Broth. ex G.Roth) I.G.Stone & G.A.M.Scott	Not Evaluated	No
Bryum canariense Brid.	Not Evaluated	No
Bryum torquescens Bruch ex De Not.	Not Evaluated	No
Buellia halonia (Ach.) Tuck.	Not Evaluated	No
Bulbine brunsvigiaefolia Baker	Not Evaluated	No
Bulbine fallax Poelln.	**Rare**	No
Bulbine fragilis G.Will.	**Rare**	No
Bulbine stolonifera Baijnath ex G.Will.	LC	No
Bulbine wiesei L.I.Hall	**Rare**	No
Bulbinella cauda-felis (L.f.) T.Durand & Schinz	LC	No
Bulbinella elegans P.L.Perry	LC	No
Calobota cytisoides (Berg.) Eckl. & Zeyh.	LC	No
Calobota sericea (Thunb.) Boatwr. & B.-E.van Wyk	LC	No
Campylopus pilifer Brid. var. pilifer	Not Evaluated	No
Caulipsolon rapaceum (Jacq.) Klak	LC	No
Cephalophyllum caespitosum H.E.K.Hartmann	LC	No
Cephalophyllum framesii L.Bolus	LC	No
Cephalophyllum niveum L.Bolus	LC	No
Cephalophyllum parvibracteatum (L.Bolus) H.E.K.Hartmann	LC	No
Cephalophyllum pulchellum L.Bolus	**VU**	No
Cephalophyllum spissum H.E.K.Hartmann	LC	No
Cephalophyllum staminodiosum L.Bolus	**Rare**	No
Chaenostoma caeruleum (L.f.) Kornhall	LC	No
Chaenostoma decipiens (Hilliard) Kornhall	LC	No
Chamaebryum pottioides Thér. & Dixon	Not Evaluated	No
Cheiridopsis namaquensis (Sond.) H.E.K.Hartmann	LC	No
Chrysocoma oblongifolia DC.	LC	No
Cissampelos capensis L.f.	LC	No
Cladoraphis spinosa (L.f.) S.M.Phillips	LC	No
Cliffortia acutifolia Weim.	LC	No
Cliffortia juniperina L.f. var. juniperina	Not Evaluated	No
Cliffortia teretifolia L.f.	LC	No

Codon royenii L.	LC	No
Colchicum volutare (Burch.) J.C.Manning & Vinn.	LC	No
Conophytum calculus (A.Berger) N.E.Br. subsp. calculus	LC	No
Conophytum hyracis S.A.Hammer	Not Evaluated	No
Conophytum minutum (Haw.) N.E.Br. var. minutum	LC	No
Conophytum minutum (Haw.) N.E.Br. var. nudum (Tischer) Boom	LC	No
Conophytum uviforme (Haw.) N.E.Br. subsp. uviforme	LC	No
Corycium ingeanum E.G.H.Oliv.	**EN**	No
Cotula leptalea DC.	LC	No
Cotula pedunculata (Schltr.) E.Phillips	**VU**	No
Cotyledon papillaris L.f.	LC	No
Crassula alpestris Thunb. subsp. alpestris	LC	No
Crassula brevifolia Harv. subsp. brevifolia	LC	No
Crassula expansa Dryand. subsp. pyrifolia (Compton) Toelken	LC	No
Crassula fascicularis Lam.	LC	No
Crassula multiceps Harv.	**Rare**	No
Crassula muscosa L. var. obtusifolia (Harv.) G.D.Rowley	LC	No
Crassula tenuipedicellata Schönland & Baker f.	LC	No
Cuspidia cernua (L.f.) B.L.Burtt subsp. annua (Less.) Roessler	LC	No
Cyanella orchidiformis Jacq.	LC	No
Cyphia digitata (Thunb.) Willd. subsp. digitata	LC	No
Cysticapnos cracca (Cham. & Schltdl.) Lidén	LC	No
Cysticapnos vesicaria (L.) Fedde subsp. vesicaria	LC	No
Diascia namaquensis Hiern	LC	No
Diascia rudolphii Hiern	LC	No
Diascia veronicoides Schltr.	LC	No
Dicrocaulon brevifolium N.E.Br.	LC	No
Dicrocaulon grandiflorum Ihlenf.	LC	No
Dicrocaulon spissum N.E.Br.	LC	No
Didelta carnosa (L.f.) Aiton var. carnosa	LC	No
Didymodon xanthocarpus (Müll.Hal.) Magill	Not Evaluated	No
Digitaria sanguinalis (L.) Scop.	Not Evaluated	No
Dimorphotheca montana Norl.	LC	No
Dimorphotheca nudicaulis (L.) DC. var. nudicaulis	LC	No
Dimorphotheca pluvialis (L.) Moench	LC	No
Dimorphotheca sinuata DC.	LC	No
Dioscorea elephantipes (L'Hér.) Engl.	**Declining**	No
Diospyros glabra (L.) De Winter	LC	No

Dischisma tomentosum Schltr.	LC	No
Drimia filifolia (Jacq.) J.C.Manning & Goldblatt	LC	No
Drosanthemum brevifolium (Aiton) Schwantes	LC	No
Drosanthemum deciduum H.E.K.Hartmann & Bruckman	LC	No
Drosanthemum framesii L.Bolus	LC	No
Drosanthemum ramosissimum (Schltr.) L.Bolus	**Rare**	No
Drosanthemum schoenlandianum (Schltr.) L.Bolus	LC	No
Drosera alba E.Phillips	LC	No
Drosera cistiflora L.	LC	No
Ehrharta calycina Sm.	LC	No
Ehrharta triandra Nees ex Trin.	LC	No
Ehrharta villosa J.H.Schult. var. villosa	LC	No
Emilia hantamensis J.C.Manning & Goldblatt	**NT**	No
Empodium namaquensis (Baker) M.F.Thomps.	LC	No
Enneapogon desvauxii P.Beauv.	LC	No
Enneapogon scaber Lehm.	LC	No
Epilobium tetragonum L. subsp. tetragonum	LC	No
Erica eremioides (MacOwan) E.G.H.Oliv. subsp. eremioides	LC	No
Erica leucanthera L.f.	LC	No
Erica plumosa Thunb.	LC	No
Eriocephalus africanus L. var. paniculatus (Cass.) M.A.N.Müll.,P.P.J.Herman & Kolberg	LC	No
Eriocephalus microcephalus DC.	LC	No
Eriocephalus namaquensis M.A.N.Müll.	LC	No
Eriocephalus pedicellaris DC.	LC	No
Eriospermum paradoxum (Jacq.) Ker Gawl.	LC	No
Euclea linearis Zeyh. ex Hiern	LC	No
Euclea tomentosa E.Mey. ex A.DC.	LC	No
Euclea undulata Thunb.	LC	No
Euphorbia cylindrica A.C.White, R.A.Dyer & B.Sloane	LC	No
Euphorbia exilis L.C.Leach	LC	No
Euphorbia fasciculata Thunb.	**VU**	No
Euryops multifidus (Thunb.) DC.	LC	No
Euryops speciosissimus DC.	LC	No
Euryops tenuissimus (L.) DC. subsp. tenuissimus	LC	No
Felicia dubia Cass.	LC	No
Felicia filifolia (Vent.) Burtt Davy subsp. schaeferi (Dinter) Grau	LC	No
Felicia heterophylla (Cass.) Grau	LC	No
Felicia hyssopifolia (P.J.Bergius) Nees subsp. glabra (DC.) Grau	LC	No

Felicia namaquana (Harv.) Merxm.	LC	No
Felicia tenella (L.) Nees subsp. cotuloides (DC.) Grau	LC	No
Ferraria ovata (Thunb.) Goldblatt & J.C.Manning	**Rare**	No
Fissidens rufescens Hornsch.	Not Evaluated	No
Fockea comaru (E.Mey.) N.E.Br.	LC	No
Foveolina dichotoma (DC.) Källersjö	LC	No
Foveolina tenella (DC.) Källersjö	LC	No
Frankenia repens (P.J.Bergius) Fourc.	LC	No
Freylinia lanceolata (L.f.) G.Don	LC	No
Funaria hygrometrica Hedw.	Not Evaluated	No
Galenia affinis Sond.	LC	No
Galenia sarcophylla Fenzl	LC	No
Gasteria brachyphylla (Salm-Dyck) Van Jaarsv. var. brachyphylla	LC	No
Gazania lichtensteinii Less.	LC	No
Gazania tenuifolia Less.	LC	No
Geissorhiza heterostyla L.Bolus	LC	No
Gethyllis campanulata L.Bolus	LC	No
Gethyllis gregoriana D.Müll.-Doblies	**Rare**	No
Gethyllis lanuginosa Marloth	LC	No
Gethyllis lata L.Bolus subsp. lata	**Rare**	No
Gethyllis linearis L.Bolus	LC	No
Gethyllis villosa (Thunb.) Thunb.	LC	No
Gladiolus lapeirousioides Goldblatt	**VU**	No
Gladiolus orchidiflorus Andrews	LC	No
Gladiolus saccatus (Klatt) Goldblatt & M.P.de Vos	LC	No
Globulariopsis stricta (P.J.Bergius) Hilliard	LC	No
Gnidia burchellii (Meisn.) Gilg	LC	No
Gomphocarpus filiformis (E.Mey.) D.Dietr.	LC	No
Goniomitrium africanum (Müll.Hal.) Broth.	Not Evaluated	No
Grielum humifusum Thunb. var. humifusum	LC	No
Grimmia laevigata (Brid.) Brid.	Not Evaluated	No
Grimmia pulvinata (Hedw.) Sm.	Not Evaluated	No
Gymnodiscus capillaris (L.f.) DC.	LC	No
Haemanthus coccineus L.	LC	No
Haemanthus crispus Snijman	LC	No

Haworthia arachnoidea (L.) Duval var. namaquensis M.B.Bayer	LC	No
Haworthia nortieri G.G.Sm. var. nortieri	LC	No
Hebenstretia dentata L.	LC	No
Helichrysum hebelepis DC.	LC	No
Helichrysum leontonyx DC.	LC	No
Heliophila adpressa O.E.Schulz	LC	No
Heliophila amplexicaulis L.f.	LC	No
Heliophila arenaria Sond. var. acocksii Marais	LC	No
Heliophila arenaria Sond. var. arenaria	LC	No
Heliophila collina O.E.Schulz	LC	No
Heliophila deserticola Schltr. var. deserticola	LC	No
Heliophila digitata L.f.	LC	No
Heliophila juncea (P.J.Bergius) Druce	LC	No
Heliophila lactea Schltr.	LC	No
Heliophila seselifolia Burch. ex DC. var. nigellifolia (Schltr.) Marais	LC	No
Heliophila variabilis Burch. ex DC.	LC	No
Heliotropium supinum L.	Not Evaluated	No
Heliotropium tubulosum E.Mey. ex A.DC.	LC	No
Hermannia comosa Burch. ex DC.	LC	No
Hermannia jacobeifolia (Turcz.) R.A.Dyer	LC	No
Hermannia prismatocarpa E.Mey. ex Harv.	LC	No
Hesperantha bachmannii Baker	LC	No
Hessea breviflora Herb.	LC	No
Hessea monticola Snijman	LC	No
Hessea pusilla Snijman	DDT	No
Hessea stellaris (Jacq.) Herb.	LC	No
Hirpicium alienatum (Thunb.) Druce	LC	No
Hoodia gordonii (Masson) Sweet ex Decne.	DDD	No
Huernia guttata (Masson) Haw. subsp. reticulata (Masson) Bruyns	LC	No
Hyobanche glabrata Hiern	LC	No
Hyobanche sanguinea L.	LC	No
Hypertelis salsoloides (Burch.) Adamson var. salsoloides	LC	No
Hypodontium dregei (Hornsch.) Müll.Hal.	Not Evaluated	No
Indigastrum guerranum (Torre) Schrire	LC	No
Indigofera amoena Aiton	LC	No
Indigofera declinata E.Mey.	LC	No
Indigofera filifolia Thunb.	LC	No

Indigofera frutescens L.f.	LC	No
Indigofera heterophylla Thunb.	LC	No
Indigofera venusta Eckl. & Zeyh.	LC	No
Jacobsenia kolbei (L.Bolus) L.Bolus & Schwantes	LC	No
Jamesbrittenia fruticosa (Benth.) Hilliard	LC	No
Jamesbrittenia thunbergii (G.Don) Hilliard	LC	No
Kirkia dewinteri Merxm. & Heine	LC	No
Lachenalia barkeriana U.Müll.-Doblies, B.Nord. & D.Müll.-Doblies	NT	No
Lachenalia elegans W.F.Barker var. membranacea W.F.Barker	LC	No
Lachenalia framesii W.F.Barker	LC	No
Lachenalia kliprandensis W.F.Barker	Rare	No
Lachnaea filamentosa Meisn.	LC	No
Lampranthus uniflorus (L.Bolus) L.Bolus	LC	No
Lampranthus watermeyeri (L.Bolus) N.E.Br.	LC	No
Lapeirousia arenicola Schltr.	LC	No
Lapeirousia exilis Goldblatt	LC	No
Lapeirousia plicata (Jacq.) Diels subsp. plicata	LC	No
Lapeirousia pyramidalis (Lam.) Goldblatt subsp. pyramidalis	LC	No
Lasiopogon glomerulatus (Harv.) Hilliard	LC	No
Lasiospermum brachyglossum DC.	LC	No
Leipoldtia weigangiana (Dinter) Dinter & Schwantes subsp. littlewoodii (L.Bolus) H.E.K.Hartmann & Rust	LC	No
Lessertia diffusa R.Br.	LC	No
Lessertia spinescens E.Mey.	LC	No
Leucadendron brunioides Meisn. var. brunioides	LC	No
Leucadendron dubium (H.Buek ex Meisn.) E.Phillips & Hutch.	LC	No
Leucadendron loranthifolium (Salisb. ex Knight) I.Williams	NT	No
Leucadendron pubescens R.Br.	LC	No
Leucoloma sprengelianum (Müll.Hal.) A.Jaeger	Not Evaluated	No
Leucospermum reflexum H.Buek ex Meisn. var. luteum Rourke	Not Evaluated	No
Leucospermum reflexum H.Buek ex Meisn. var. reflexum	Not Evaluated	No
Leucospermum rodolentum (Salisb. ex Knight) Rourke	VU	No
Leysera gnaphalodes (L.) L.	LC	No
Leysera tenella DC.	LC	No
Limeum africanum L. subsp. africanum	LC	No
Limeum deserticolum Dinter & G.Schellenb.	LC	No
Lithops divergens L.Bolus	NT	No

Lobostemon glaucophyllus (Jacq.) H.Buek	LC	No
Lobostemon laevigatus (L.) H.Buek	LC	No
Lophochloa pumila (Desf.) Bor	Not Evaluated	No
Lotononis falcata (E.Mey.) Benth.	LC	No
Lotononis leptoloba Bolus	LC	No
Lotononis maximiliani Schltr. ex De Wild.	LC	No
Lotononis stenophylla (Eckl. & Zeyh.) B.-E.van Wyk	LC	No
Lycium amoenum Dammer	LC	No
Lycium bosciifolium Schinz	LC	No
Lycium oxycarpum Dunal	LC	No
Lyperia tristis (L.f.) Benth.	LC	No
Macrostylis squarrosa Bartl. & H.L.Wendl.	LC	No
Malephora purpureo-crocea (Haw.) Schwantes	LC	No
Manulea gariesiana Hilliard	LC	No
Manulea laxa Schltr.	LC	No
Marsilea burchellii (Kunze) A.Braun	LC	No
Massonia bifolia (Jacq.) J.C.Manning & Goldblatt	LC	No
Maytenus acuminata (L.f.) Loes. var. acuminata	LC	No
Mesembryanthemum crystallinum L.	LC	No
Mesembryanthemum fastigiatum Thunb.	LC	No
Mesembryanthemum guerichianum Pax	LC	No
Metalasia acuta P.O.Karis	LC	No
Metalasia densa (Lam.) P.O.Karis	LC	No
Metalasia fastigiata (Thunb.) D.Don	LC	No
Metalasia muricata (L.) D.Don	LC	No
Microloma sagittatum (L.) R.Br.	LC	No
Microloma tenuifolium (L.) K.Schum.	LC	No
Monechma spartioides (T.Anderson) C.B.Clarke	LC	No
Monilaria chrysoleuca (Schltr.) Schwantes	LC	No
Monilaria moniliformis (Thunb.) Ihlenf. & S.Jörg.	LC	No
Montinia caryophyllacea Thunb.	LC	No
Moraea aspera Goldblatt	VU	No
Moraea ciliata (L.f.) Ker Gawl.	LC	No
Moraea fenestrata (Goldblatt) Goldblatt	Rare	No
Moraea knersvlaktensis Goldblatt	LC	No
Moraea macrocarpa Goldblatt	LC	No
Moraea serpentina Baker	LC	No
Morella integra (A.Chev.) Killick	LC	No
Muraltia heisteria (L.) DC.	LC	No
Myrsine africana L.	LC	No

Nemesia ligulata E.Mey. ex Benth.	LC	No
Nemesia pulchella Schltr. ex Hiern	LC	No
Notechidnopsis tessellata (Pillans) Lavranos & Bleck	LC	No
Oedera multipunctata (DC.) Anderb. & K.Bremer	NT	No
Oedera sedifolia (DC.) Anderb. & K.Bremer	LC	No
Oedera squarrosa (L.) Anderb. & K.Bremer	LC	No
Oncosiphon grandiflorum (Thunb.) Källersjö	LC	No
Oncosiphon suffruticosum (L.) Källersjö	LC	No
Oophytum nanum (Schltr.) L.Bolus	LC	No
Ornithogalum hispidum Hornem. subsp. hispidum	LC	No
Ornithogalum pruinosum F.M.Leight.	LC	No
Orthotrichum diaphanum (Schrad. ex Brid.) Lindb.	Not Evaluated	No
Orthotrichum incurvomarginatum Lewinsky & Van Rooy	Not Evaluated	No
Orthotrichum subexsertum Schimp. ex Müll.Hal.	Not Evaluated	No
Osteospermum bidens Thunb.	LC	No
Osteospermum grandiflorum DC.	LC	No
Osteospermum rigidum Aiton var. elegans (Bolus) Norl.	LC	No
Othonna bulbosa L.	LC	No
Othonna floribunda Schltr.	LC	No
Othonna intermedia Compton	Threatened	No
Othonna mucronata Harv.	LC	No
Othonna parviflora P.J.Bergius	LC	No
Othonna pavonia E.Mey.	LC	No
Othonna sedifolia DC.	LC	No
Ottosonderia monticola (Sond.) L.Bolus	LC	No
Oxalis adenodes Sond.	LC	No
Oxalis dines Ornduff	VU	No
Oxalis flava L.	Not Evaluated	No
Oxalis obtusa Jacq.	LC	No
Oxalis pulvinata Sond.	LC	No
Oxalis senecta T.M.Salter	NT	No
Oxalis tenella Jacq.	LC	No
Paranomus bracteolaris Salisb. ex Knight	LC	No
Pectinaria maughanii (R.A.Dyer) Bruyns	LC	No
Pelargonium alternans J.C.Wendl.	LC	No
Pelargonium antidysentericum (Eckl. & Zeyh.) Kostel. subsp. antidysentericum	LC	No
Pelargonium chamaedryfolium Jacq.	LC	No

Pelargonium coronopifolium Jacq.	LC	No
Pelargonium crispum (P.J.Bergius) L'Hér.	LC	No
Pelargonium echinatum Curtis	LC	No
Pelargonium englerianum R.Knuth	LC	No
Pelargonium fulgidum (L.) L'Hér.	LC	No
Pelargonium grossularioides (L.) L'Hér.	LC	No
Pelargonium moniliforme Harv.	LC	No
Pelargonium myrrhifolium (L.) L'Hér. var. myrrhifolium	LC	No
Pelargonium praemorsum (Andrews) F.Dietr. subsp. praemorsum	LC	No
Pelargonium scabrum (Burm.f.) L'Hér.	LC	No
Pelargonium tabulare (Burm.f.) L'Hér.	LC	No
Pelargonium triste (L.) L'Hér.	LC	No
Pentameris pallida (Thunb.) Galley & H.P.Linder	LC	No
Pentzia dentata (L.) Kuntze	LC	No
Phalaris minor Retz.	Not Evaluated	No
Pharnaceum albens L.f.	LC	No
Pharnaceum aurantium (DC.) Druce	LC	No
Pharnaceum croceum E.Mey. ex Fenzl	LC	No
Pharnaceum lanatum Bartl.	LC	No
Pharnaceum microphyllum L.f. var. microphyllum	LC	No
Philonotis globosa (Müll.Hal.) D.G.Griffin & W.R.Buck	Not Evaluated	No
Phylica cuspidata Eckl. & Zeyh. var. cuspidata	**VU**	No
Phylica imberbis P.J.Bergius var. secunda Sond.	LC	No
Phyllobolus chrysophthalmus Gerbaulet & Struck	**Rare**	No
Phyllobolus congestus (L.Bolus) Gerbaulet	**VU**	No
Phyllobolus delus (L.Bolus) Gerbaulet	LC	No
Phyllobolus nitidus (Haw.) Gerbaulet	LC	No
Phyllobolus spinuliferus (Haw.) Gerbaulet	LC	No
Phyllobolus trichotomus (Thunb.) Gerbaulet	LC	No
Piaranthus punctatus (Masson) R.Br. var. punctatus	LC	No
Poa bulbosa L.	LC	No
Polemanniopsis marlothii (H.Wolff) B.L.Burtt	LC	No
Polycarena aurea Benth.	LC	No
Polygala myrtifolia L. var. myrtifolia	LC	No
Polygala scabra L.	LC	No
Prenia pallens (Aiton) N.E.Br. subsp. lancea (Thunb.) Gerbaulet	LC	No
Printzia polifolia (L.) Hutch.	LC	No

Prosopis glandulosa Torr. var. torreyana (Benson) M.C.Johnst.	Not Evaluated	No
Protea glabra Thunb.	LC	No
Protea laurifolia Thunb.	LC	No
Psammotropha anguina Compton	LC	No
Psammotropha quadrangularis (L.f.) Fenzl	LC	No
Pseudocrossidium crinitum (Schultz) R.H.Zander	Not Evaluated	No
Pseudocrossidium hornschuchianum (Schultz) R.H.Zander	Not Evaluated	No
Psilocaulon dinteri (Engl.) Schwantes	LC	No
Psilocaulon leptarthron (A.Berger) N.E.Br.	LC	No
Psoralea oligophylla Eckl. & Zeyh.	LC	No
Pteronia camphorata (L.) L. var. camphorata	LC	No
Pteronia camphorata (L.) L. var. laevigata Harv.	LC	No
Pteronia divaricata (P.J.Bergius) Less.	LC	No
Pteronia glabrata L.f.	LC	No
Pteronia heterocarpa DC.	LC	No
Pteronia oblanceolata E.Phillips	LC	No
Pteronia villosa L.f.	LC	No
Quaqua mammillaris (L.) Bruyns	LC	No
Quaqua parviflora (Masson) Bruyns subsp. swanepoelii (Lavranos) Bruyns	LC	No
Rafnia amplexicaulis (L.) Thunb.	LC	No
Rafnia diffusa Thunb.	LC	No
Restio gaudichaudianus Kunth	LC	No
Restio ocreatus Kunth	LC	No
Rhynchopsidium pumilum (L.f.) DC.	LC	No
Riccia bullosa Link ex Lindenb.	Not Evaluated	No
Riccia cavernosa Hoffm. emend. Raddi	Not Evaluated	No
Riccia schelpei O.H.Volk & Perold	Not Evaluated	No
Riccia villosa Steph.	Not Evaluated	No
Romulea luteoflora (M.P.de Vos) M.P.de Vos var. luteoflora	LC	No
Rumex cordatus Poir.	LC	No
Ruschia leucosperma L.Bolus	LC	No
Ruschia muelleri (L.Bolus) Schwantes	LC	No
Ruschia stricta L.Bolus	LC	No
Ruschia subsphaerica L.Bolus	DDT	No
Salsola decussata C.A.Sm. ex Botsch.	LC	No

Salsola zeyheri (Moq.) Bunge	LC	No
Salvia africana-lutea L.	LC	No
Salvia disermas L.	LC	No
Sarcocornia natalensis (Bunge ex Ung.-Sternb.) A.J.Scott var. natalensis	LC	No
Sarcocornia terminalis (Toelken) A.J.Scott	LC	No
Sarcocornia xerophila (Toelken) A.J.Scott	LC	No
Sarcostemma viminale (L.) R.Br. subsp. viminale	LC	No
Satyrium pulchrum S.D.Johnson & Kurzweil	VU	No
Schismus barbatus (Loefl. ex L.) Thell.	LC	No
Searsia burchellii (Sond. ex Engl.) Moffett	LC	No
Searsia lancea (L.f.) F.A.Barkley	LC	No
Searsia lucida (L.) F.A.Barkley forma lucida	Not Evaluated	No
Searsia undulata (Jacq.) T.S.Yi, A.J.Mill. & J.Wen	LC	No
Sebaea pentandra E.Mey. var. pentandra	LC	No
Selago glabrata Choisy	LC	No
Selago micradenia Hilliard	LC	No
Selago scabrida Thunb.	LC	No
Senecio cardaminifolius DC.	LC	No
Senecio erosus L.f.	LC	No
Senecio sophioides DC.	LC	No
Senecio tortuosus DC.	LC	No
Serruria aitonii R.Br.	LC	No
Serruria fucifolia Salisb. ex Knight	EN	No
Sesamum capense Burm.f.	LC	No
Solanum burchellii Dunal	LC	No
Solanum tomentosum L. var. tomentosum	LC	No
Sparaxis tricolor (Schneev.) Ker Gawl.	VU	No
Spatalla incurva (Thunb.) R.Br.	LC	No
Stachys flavescens Benth.	LC	No
Stachys zeyheri Skan	LC	No
Stapelia acuminata Masson	LC	No
Stapelia paniculata Willd. subsp. paniculata	NT	No
Stapeliopsis saxatilis (N.E.Br.) Bruyns subsp. saxatilis	Not Evaluated	No
Stipagrostis brevifolia (Nees) De Winter	LC	No
Stipagrostis namaquensis (Nees) De Winter	LC	No
Stipagrostis zeyheri (Nees) De Winter subsp. zeyheri	LC	No
Stoebe aethiopica L.	LC	No
Stoeberia frutescens (L.Bolus) Van Jaarsv.	LC	No

Strumaria aestivalis Snijman	VU	No
Strumaria massoniella (D.& U.Müll.-Doblies) Snijman	VU	No
Strumaria truncata Jacq.	LC	No
Struthiola ciliata (L.) Lam.	LC	No
Struthiola leptantha Bolus	LC	No
Sutherlandia frutescens (L.) R.Br.	LC	No
Sutherlandia microphylla Burch. ex DC.	LC	No
Syncarpha dregeana (DC.) B.Nord.	LC	No
Syncarpha variegata (P.J.Bergius) B.Nord.	LC	No
Syntrichia leucostega (Müll.Hal.) R.H.Zander var. leucostega	Not Evaluated	No
Teedia lucida (Sol.) Rudolphi	LC	No
Tetragonia fruticosa L.	LC	No
Tetragonia glauca Fenzl	LC	No
Tetragonia spicata L.f.	LC	No
Tetragonia verrucosa Fenzl	LC	No
Tetrapterum tetragonum (Hook.) A.L.Andrews	Not Evaluated	No
Thamnochortus platypteris Kunth	LC	No
Thesium lineatum L.f.	LC	No
Thesium translucens A.W.Hill	LC	No
Tortella xanthocarpa (Schimp. ex Müll.Hal.) Broth.	Not Evaluated	No
Tortula atrovirens (Sm.) Lindb.	Not Evaluated	No
Trachyandra dissecta Oberm.	LC	No
Trachyandra falcata (L.f.) Kunth	LC	No
Trachyandra flexifolia (L.f.) Kunth	LC	No
Trachyandra hantamensis Boatwr. & J.C.Manning	Not Evaluated	No
Trachyandra karrooica Oberm.	LC	No
Trachyandra muricata (L.f.) Kunth	LC	No
Trachyandra revoluta (L.) Kunth	LC	No
Trachyandra tortilis (Baker) Oberm.	LC	No
Tribolium utriculosum (Nees) Renvoize	LC	No
Trichostomum brachydontium Bruch	Not Evaluated	No
Trigonocapnos lichtensteinii (Cham. & Schltdl.) Lidén	LC	No
Triquetrella tristicha (Müll.Hal.) Müll.Hal.	Not Evaluated	No
Tylecodon nolteei Lavranos	VU	No
Tylecodon pearsonii (Schönland) Toelken	LC	No

Tylecodon tenuis (Toelken) Bruyns	**Rare**	No
Ursinia anthemoides (L.) Poir. subsp. anthemoides	LC	No
Ursinia chrysanthemoides (Less.) Harv.	LC	No
Ursinia nana DC. subsp. nana	LC	No
Ursinia pygmaea DC.	**Rare**	No
Ursinia sericea (Thunb.) N.E.Br.	LC	No
Vanzijlia annulata (A.Berger) L.Bolus	LC	No
Vellereophyton dealbatum (Thunb.) Hilliard & B.L.Burtt	LC	No
Vrolijkheidia peraristata (Müll.Hal.) R.H.Zander & Hedd.	Not Evaluated	No
Wahlenbergia annularis A.DC.	LC	No
Wahlenbergia divergens A.DC.	DDT	No
Wahlenbergia paniculata (Thunb.) A.DC.	LC	No
Watsonia schlechteri L.Bolus	LC	No
Wiborgia obcordata (P.J.Bergius) Thunb.	LC	No
Wiborgia sericea Thunb.	LC	No
Wiborgiella leipoldtiana (Schltr. ex R.Dahlgren) Boatwr. & B.-E.van Wyk	LC	No
Willdenowia incurvata (Thunb.) H.P.Linder	LC	No
Wurmbea variabilis B.Nord.	LC	No
Xanthoparmelia walteri M.D.E.Knox	Not Evaluated	No
Xenoscapa fistulosa (Spreng. ex Klatt) Goldblatt & J.C.Manning	LC	No
Xiphotheca reflexa (Thunb.) A.L.Schutte & B.-E.van Wyk	**EN**	No
Zaluzianskya affinis Hilliard	LC	No
Zaluzianskya benthamiana Walp.	LC	No
Zaluzianskya pusilla (Benth.) Walp.	LC	No
Zyrphelis microcephala (Less.) Nees subsp. microcephala	LC	No

APPENDIX B: EXPECTED AVIFAUNAL SPECIES

Species	Common Name	Conservation Status	
		Regional (Eskom, 2016	Global (IUCN, 2017)
Acrocephalus baeticatus	Reed-warbler, African	Unlisted	Unlisted
Acrocephalus gracilirostris	Swamp-warbler, Lesser	Unlisted	LC
Afrotis afra	Korhaan, Southern Black	VU	VU
Alopochen aegyptiacus	Goose, Egyptian	Unlisted	LC
Anas capensis	Teal, Cape	Unlisted	LC
Anas erythrorhyncha	Teal, Red-billed	Unlisted	LC
Anas smithii	Shoveler, Cape	Unlisted	LC
Anas undulata	Duck, Yellow-billed	Unlisted	LC
Anthoscopus minutus	Penduline-tit, Cape	Unlisted	LC
Anthropoides paradiseus	Crane, Blue	NT	VU
Anthus cinnamomeus	Pipit, African	Unlisted	LC
Apus affinis	Swift, Little	Unlisted	LC
Apus apus	Swift, Common	Unlisted	LC
Apus caffer	Swift, White-rumped	Unlisted	LC
Aquila pennatus	Eagle, Booted	Unlisted	Unlisted
Aquila verreauxii	Eagle, Verreaux's	VU	LC
Ardea cinerea	Heron, Grey	Unlisted	LC
Ardea melanocephala	Heron, Black-headed	Unlisted	LC
Batis pririt	Batis, Pririt	Unlisted	LC
Bostrychia hagedash	Ibis, Hadeda	Unlisted	LC
Bradornis infuscatus	Flycatcher, Chat	Unlisted	LC
Bubo africanus	Eagle-owl, Spotted	Unlisted	LC
Bubulcus ibis	Egret, Cattle	Unlisted	LC
Burhinus capensis	Thick-knee, Spotted	Unlisted	LC
Buteo rufofuscus	Buzzard, Jackal	Unlisted	LC
Buteo vulpinus	Buzzard, Steppe	Unlisted	Unlisted
Calandrella cinerea	Lark, Red-capped	Unlisted	LC
Calendulauda albescens	Lark, Karoo	Unlisted	LC
Calendulauda barlowi	Lark, Barlow's	NT	Unlisted
Calidris ferruginea	Sandpiper, Curlew	Unlisted	NT
Calidris minuta	Stint, Little	Unlisted	LC
Cercomela familiaris	Chat, Familiar	Unlisted	LC
Cercomela schlegelii	Chat, Karoo	Unlisted	LC

Cercomela sinuata	Chat, Sickle-winged	Unlisted	LC
Cercomela tractrac	Chat, Tractrac	Unlisted	LC
Cercotrichas coryphoeus	Scrub-robin, Karoo	Unlisted	Unlisted
Certhilauda benguelensis	Lark, Benguela Long-billed	Unlisted	Unlisted
Certhilauda brevirostris	Lark, Agulhas Long-billed	NT	Unlisted
Certhilauda curvirostris	Lark, Cape Long-billed	Unlisted	LC
Certhilauda semitorquata	Lark, Eastern Long-billed	Unlisted	LC
Certhilauda subcoronata	Lark, Karoo Long-billed	Unlisted	LC
Charadrius pecuarius	Plover, Kittlitz's	Unlisted	LC
Charadrius tricollaris	Plover, Three-banded	Unlisted	LC
Chersomanes albofasciata	Lark, Spike-heeled	Unlisted	LC
Chlidonias hybrida	Tern, Whiskered	Unlisted	LC
Chrysococcyx caprius	Cuckoo, Diderick	Unlisted	LC
Ciconia nigra	Stork, Black	VU	LC
Cinnyris chalybeus	Sunbird, Southern Double-collared	Unlisted	LC
Cinnyris fuscus	Sunbird, Dusky	Unlisted	LC
Circaetus pectoralis	Snake-eagle, Black-chested	Unlisted	LC
Circus maurus	Harrier, Black	EN	VU
Cisticola subruficapilla	Cisticola, Grey-backed	Unlisted	LC
Cisticola tinniens	Cisticola, Levaillant's	Unlisted	LC
Colius colius	Mousebird, White-backed	Unlisted	LC
Colius striatus	Mousebird, Speckled	Unlisted	LC
Columba guinea	Pigeon, Speckled	Unlisted	LC
Corvus albus	Crow, Pied	Unlisted	LC
Corvus capensis	Crow, Cape	Unlisted	LC
Cossypha caffra	Robin-chat, Cape	Unlisted	LC
Coturnix coturnix	Quail, Common	Unlisted	LC
Creatophora cinerea	Starling, Wattled	Unlisted	LC
Crithagra albogularis	Canary, White-throated	Unlisted	LC
Crithagra flaviventris	Canary, Yellow	Unlisted	LC
Cursorius rufus	Courser, Burchell's	VU	LC
Egretta intermedia	Egret, Yellow-billed	Unlisted	Unlisted
Elanus caeruleus	Kite, Black-shouldered	Unlisted	LC
Emberiza capensis	Bunting, Cape	Unlisted	LC
Emberiza impetuani	Bunting, Lark-like	Unlisted	LC
Eremomela gregalis	Eremomela, Karoo	Unlisted	LC

Eremomela icteropygialis	Eremomela, Yellow-bellied	Unlisted	LC
Eremopterix australis	Sparrowlark, Black-eared	Unlisted	LC
Eremopterix verticalis	Sparrowlark, Grey-backed	Unlisted	LC
Estrilda astrild	Waxbill, Common	Unlisted	LC
Euplectes orix	Bishop, Southern Red	Unlisted	LC
Eupodotis vigorsii	Korhaan, Karoo	NT	LC
Falco biarmicus	Falcon, Lanner	VU	LC
Falco rupicoloides	Kestrel, Greater	Unlisted	LC
Falco rupicolus	Kestrel, Rock	Unlisted	Unlisted
Fulica cristata	Coot, Red-knobbed	Unlisted	Unlisted
Galerida magnirostris	Lark, Large-billed	Unlisted	LC
Gallinula chloropus	Moorhen, Common	Unlisted	LC
Geocolaptes olivaceus	Woodpecker, Ground	Unlisted	LC
Himantopus himantopus	Stilt, Black-winged	Unlisted	LC
Hirundo albigularis	Swallow, White-throated	Unlisted	LC
Hirundo cucullata	Swallow, Greater Striped	Unlisted	LC
Hirundo dimidiata	Swallow, Pearl-breasted	Unlisted	LC
Hirundo fuligula	Martin, Rock	Unlisted	Unlisted
Hirundo rustica	Swallow, Barn	Unlisted	LC
Indicator indicator	Honeyguide, Greater	Unlisted	LC
Lamprotornis nitens	Starling, Cape Glossy	Unlisted	LC
Lanius collaris	Fiscal, Common (Southern)	Unlisted	LC
Malcorus pectoralis	Warbler, Rufous-eared	Unlisted	LC
Melierax canorus	Goshawk, Southern Pale Chanting	Unlisted	LC
Merops apiaster	Bee-eater, European	Unlisted	LC
Merops hirundineus	Bee-eater, Swallow-tailed	Unlisted	LC
Milvus aegyptius	Kite, Yellow-billed	Unlisted	Unlisted
Motacilla capensis	Wagtail, Cape	Unlisted	LC
Myrmecocichla formicivora	Chat, Anteating	Unlisted	Unlisted
Nectarinia famosa	Sunbird, Malachite	Unlisted	LC
Neotis ludwigii	Bustard, Ludwig's	EN	EN
Netta erythrophthalma	Pochard, Southern	Unlisted	LC
Numida meleagris	Guineafowl, Helmeted	Unlisted	LC
Oena capensis	Dove, Namaqua	Unlisted	LC
Oenanthe monticola	Wheatear, Mountain	Unlisted	LC
Oenanthe pileata	Wheatear, Capped	Unlisted	LC
Onychognathus nabouroup	Starling, Pale-winged	Unlisted	LC

Oxyura maccoa	Duck, Maccoa	NT	NT
Parisoma layardi	Tit-babbler, Layard's	Unlisted	Unlisted
Parisoma subcaeruleum	Tit-babbler, Chestnut-vented	Unlisted	Unlisted
Parus afer	Tit, Grey	Unlisted	LC
Passer domesticus	Sparrow, House	Unlisted	LC
Passer melanurus	Sparrow, Cape	Unlisted	LC
Phalacrocorax africanus	Cormorant, Reed	Unlisted	LC
Phalacrocorax carbo	Cormorant, White-breasted	Unlisted	LC
Philomachus pugnax	Ruff, Ruff	Unlisted	LC
Phragmacia substriata	Warbler, Namaqua	Unlisted	LC
Platalea alba	Spoonbill, African	Unlisted	LC
Plectropterus gambensis	Goose, Spur-winged	Unlisted	LC
Ploceus capensis	Weaver, Cape	Unlisted	LC
Ploceus velatus	Masked-weaver, Southern	Unlisted	LC
Podiceps nigricollis	Grebe, Black-necked	Unlisted	LC
Polemaetus bellicosus	Eagle, Martial	EN	VU
Prinia hypoxantha	Prinia, Drakensberg	Unlisted	LC
Prinia maculosa	Prinia, Karoo	Unlisted	LC
Pternistis capensis	Spurfowl, Cape	Unlisted	LC
Pterocles namaqua	Sandgrouse, Namaqua	Unlisted	LC
Pycnonotus capensis	Bulbul, Cape	Unlisted	LC
Recurvirostra avosetta	Avocet, Pied	Unlisted	LC
Riparia paludicola	Martin, Brown-throated	Unlisted	LC
Sagittarius serpentarius	Secretarybird	VU	VU
Saxicola torquatus	Stonechat, African	Unlisted	LC
Scleroptila africanus	Francolin, Grey-winged	Unlisted	LC
Scopus umbretta	Hamerkop, Hamerkop	Unlisted	LC
Serinus alario	Canary, Black-headed	Unlisted	LC
Sigelus silens	Flycatcher, Fiscal	Unlisted	LC
Spreo bicolor	Starling, Pied	Unlisted	LC
Stenostira scita	Flycatcher, Fairy	Unlisted	LC
Streptopelia capicola	Turtle-dove, Cape	Unlisted	LC
Streptopelia semitorquata	Dove, Red-eyed	Unlisted	LC
Streptopelia senegalensis	Dove, Laughing	Unlisted	LC
Struthio camelus	Ostrich, Common	Unlisted	LC
Sturnus vulgaris	Starling, Common	Unlisted	LC
Sylvietta rufescens	Crombec, Long-billed	Unlisted	LC

Tachybaptus ruficollis	Grebe, Little	Unlisted	LC
Tachymarptis melba	Swift, Alpine	Unlisted	LC
Tadorna cana	Shelduck, South African	Unlisted	LC
Telophorus zeylonus	Bokmakierie, Bokmakierie	Unlisted	LC
Threskiornis aethiopicus	Ibis, African Sacred	Unlisted	LC
Tricholaema leucomelas	Barbet, Acacia Pied	Unlisted	LC
Tringa glareola	Sandpiper, Wood	Unlisted	LC
Tringa nebularia	Greenshank, Common	Unlisted	LC
Tringa stagnatilis	Sandpiper, Marsh	Unlisted	LC
Turdus olivaceus	Thrush, Olive	Unlisted	LC
Turdus smithi	Thrush, Karoo	Unlisted	LC
Upupa africana	Hoopoe, African	Unlisted	Unlisted
Urocolius indicus	Mousebird, Red-faced	Unlisted	LC
Vanellus armatus	Lapwing, Blacksmith	Unlisted	LC
Vanellus coronatus	Lapwing, Crowned	Unlisted	LC
Vidua macroura	Whydah, Pin-tailed	Unlisted	LC
Zosterops pallidus	White-eye, Orange River	Unlisted	LC
Zosterops virens	White-eye, Cape	Unlisted	LC

APPENDIX C: EXPECTED MAMMAL SPECIES

Species	Common name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2017)
Felis nigripes	Black-footed Cat	VU	VU
Panthera pardus	Leopard	VU	VU
Graphiurus ocularis	Spectacled Dormouse	NT	LC
Parotomys littledalei	Littledale's Whistling Rat	NT	LC
Pelea capreolus	Grey Rhebok	NT	LC
Poecilogale albinucha	African Striped Weasel	NT	LC
Antidorcas marsupialis	Springbok	LC	LC
Canis mesomelas	Black-backed Jackal	LC	LC
Caracal caracal	Caracal	LC	LC
Crocidura cyanea	Reddish-grey Musk Shrew	LC	LC
Cryptomys hottentotus	Common Mole-rat	LC	LC
Cynictis penicillata	Yellow Mongoose	LC	LC
Desmodillus auricularis	Short-tailed Gerbil	LC	LC
Elephantulus rupestris	Western Rock Sengi	LC	LC
Eptesicus hottentotus	Long-tailed Serotine Bat	LC	LC
Felis silvestris	African Wildcat	LC	LC
Genetta genetta	Small-spotted Genet	LC	LC
Gerbilliscus afra	Cape Gerbil	LC	LC
Gerbillurus paeba	Hairy-footed Gerbil	LC	LC
Herpestes pulverulentus	Cape Grey Mongoose	LC	LC
Hystrix africaeaustralis	Cape Porcupine	LC	LC
Ictonyx striatus	Striped Polecat	LC	LC
Lepus capensis	Cape Hare	LC	LC
Lepus saxatilis	Scrub Hare	LC	LC
Malacothrix typica	Large-eared Mouse	LC	LC
Mellivora capensis	Honey Badger	LC	LC
Mus minutoides	Pygmy Mouse	LC	LC
Neoromicia capensis	Cape Serotine Bat	LC	LC
Nycteris thebaica	Egyptian Slit-faced Bat	LC	LC
Oreotragus oreotragus	Klipspringer	LC	LC
Orycteropus afer	Aardvark	LC	LC
Otocyon megalotis	Bat-eared Fox	LC	LC
Otomys unisulcatus	Karoo Bush Rat	LC	LC
Papio ursinus	Chacma Baboon	LC	LC
Parotomys brantsii	Brants Whistling Rat	LC	LC

Petromyscus barbouri	Barbour's Rock House	LC	LC
Petromyscus collinus	Pygmy Rock Mouse	LC	LC
Procavia capensis	Rock Hyrax	LC	LC
Proteles cristata	Aardwolf	LC	LC
Raphicerus campestris	Steenbok	LC	LC
Raphicerus melanotis	Cape Grysbok	LC	LC
Rhabdomys pumilio	Xeric Four-striped Mouse	LC	LC
Rhinolophus capensis	Cape Horseshoe Bat	LC	LC
Sauromys petrophilus	Flat-headed Free-tail Bat	LC	LC
Suncus varilla	Lesser Dwarf Shrew	LC	LC
Suricata suricatta	Suricate	LC	LC
Sylvicapra grimmia	Common Duiker	LC	LC
Tadarida aegyptiaca	Egyptian Free-tailed Bat	LC	LC
Vulpes chama	Cape Fox	LC	LC
Aethomys namaquensis	Namaqua Rock Rat	Unlisted	LC
Mus musculus	House Mouse	Unlisted	LC

APPENDIX D: EXPECTED REPTILE AND AMPHIBIAN SPECIES

Species	Common name	Conservation Status	
		Regional (Bates et al., 2014)	Global (IUCN, 2017)
Acontias lineatus	Striped Dwarf Legless Skink	Unlisted	LC
Agama aculeata aculeata	Western Ground Agama	Unlisted	LC
Agama hispida	Southern Spiny Agama	Unlisted	LC
Chamaeleo namaquensis	Namaqua Chameleon	LC	LC
Chondrodactylus angulifer angulifer	Common Giant Gecko	LC	LC
Cordylosaurus subtessellatus	Dwarf Plated Lizard	Unlisted	LC
Dasypeltis scabra	Rhombic Egg-Eater	LC	LC
Naja nivea	Cape Cobra	LC	Unlisted
Pachydactylus labialis	Western Cape Gecko	Unlisted	LC
Species	**Common name**	**Conservation Status**	
		Regional (Bates et al., 2014)	**IUCN (2017)**
Cacosternum namaquense	Namaqua Caco	LC	LC
Tomopterna delalandii	Cape Sand Frog	LC	LC
Vandijkophrynus gariepensis	Karoo Toad	LC	LC
Vandijkophrynus robinsoni	Paradise Toad	LC	LC
Xenopus laevis	Common Platanna	LC	LC