



BIODIVERSITY ASSESSMENT KANAKIES

NORTHERN CAPE PROVINCE

June 2017

REFERENCE

Kanakies

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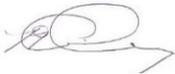
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Report Name	BIODIVERSITY ASSESSMENT KANAKIES
Reference	Kanakies
Submitted to	Cabanga
Report writer	Peter Kimberg 
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EXECUTIVE SUMMARY

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 sensitivity, 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 Karoo 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 km² area is formally conserved, and the Succulent Karoo's biodiversity is under pressure from a range of sources.

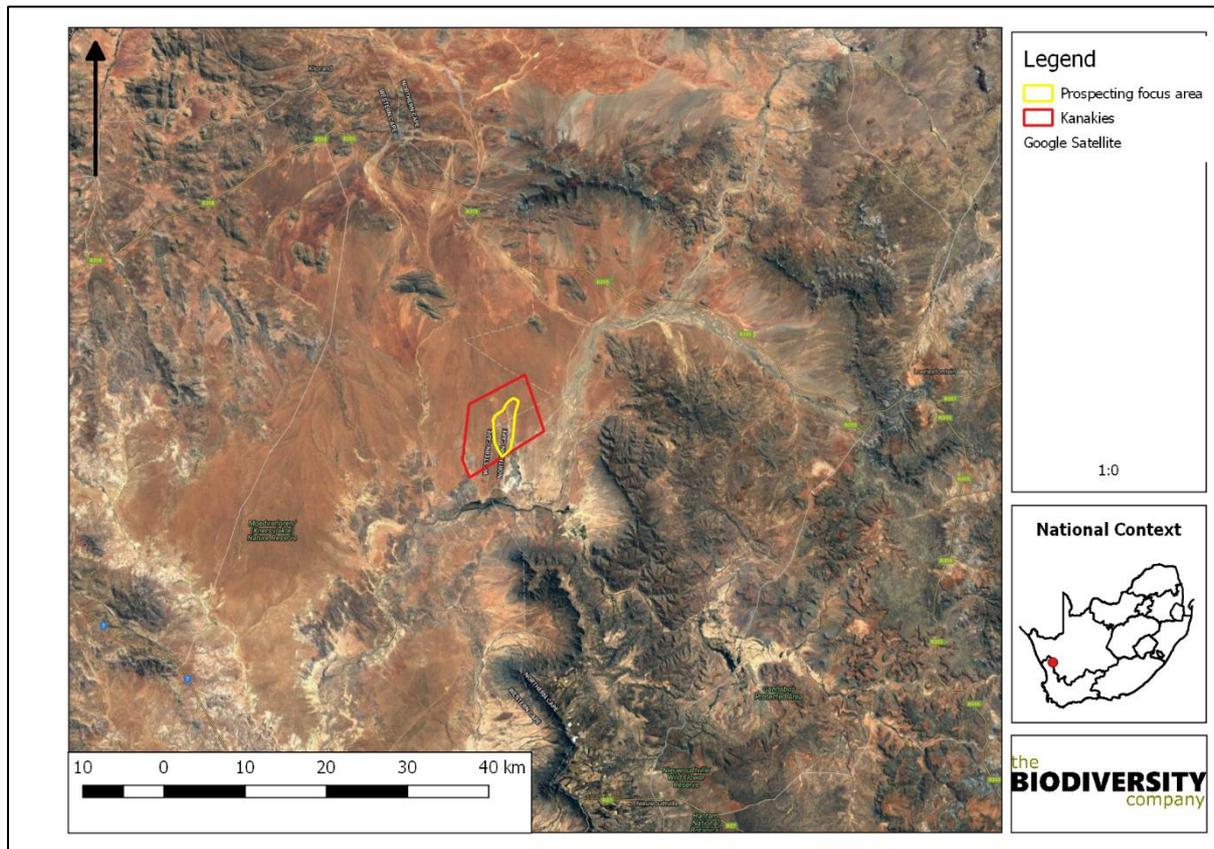


Figure 1: The location of the proposed Kanakies project area and the prospecting focus area approximately 41 km west of Loeriesfontein on the border between the Northern Cape and Western Cape Provinces

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 whilst 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 sensitivity, 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).

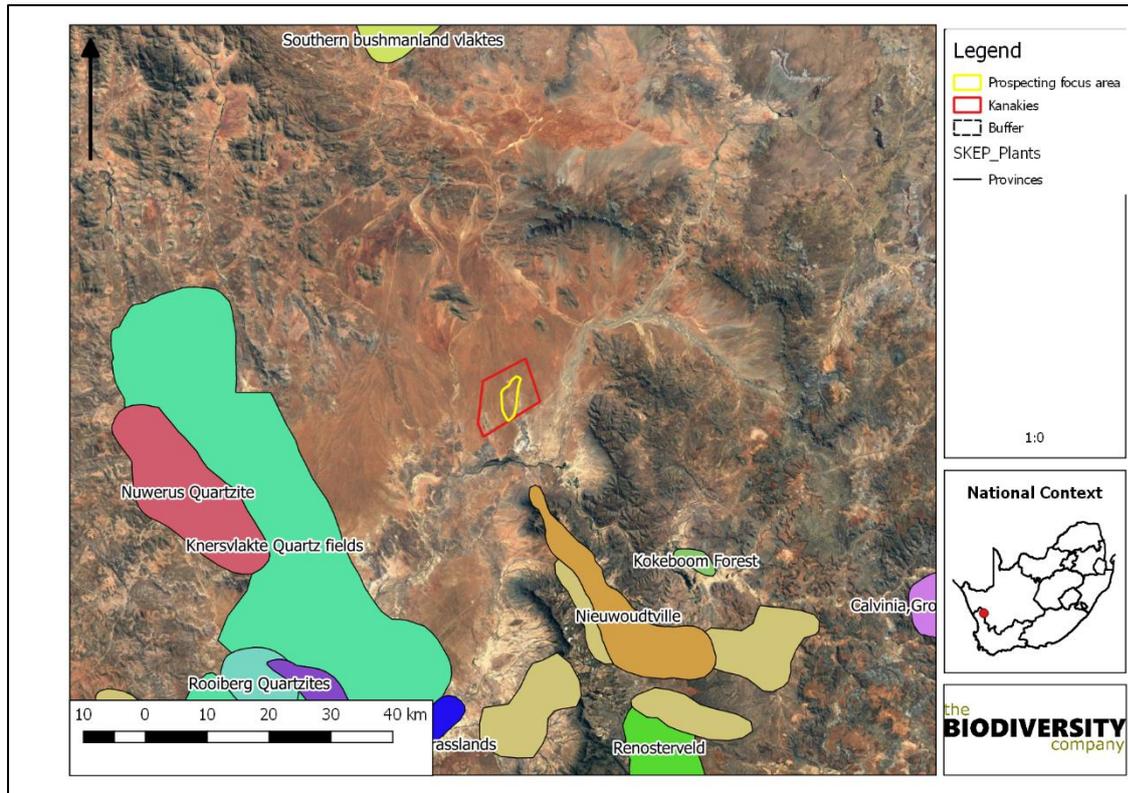


Figure 2: Location of the Kanakies project area in relation to areas of known plant sensitivity (DRIVER ET AL., 2003)



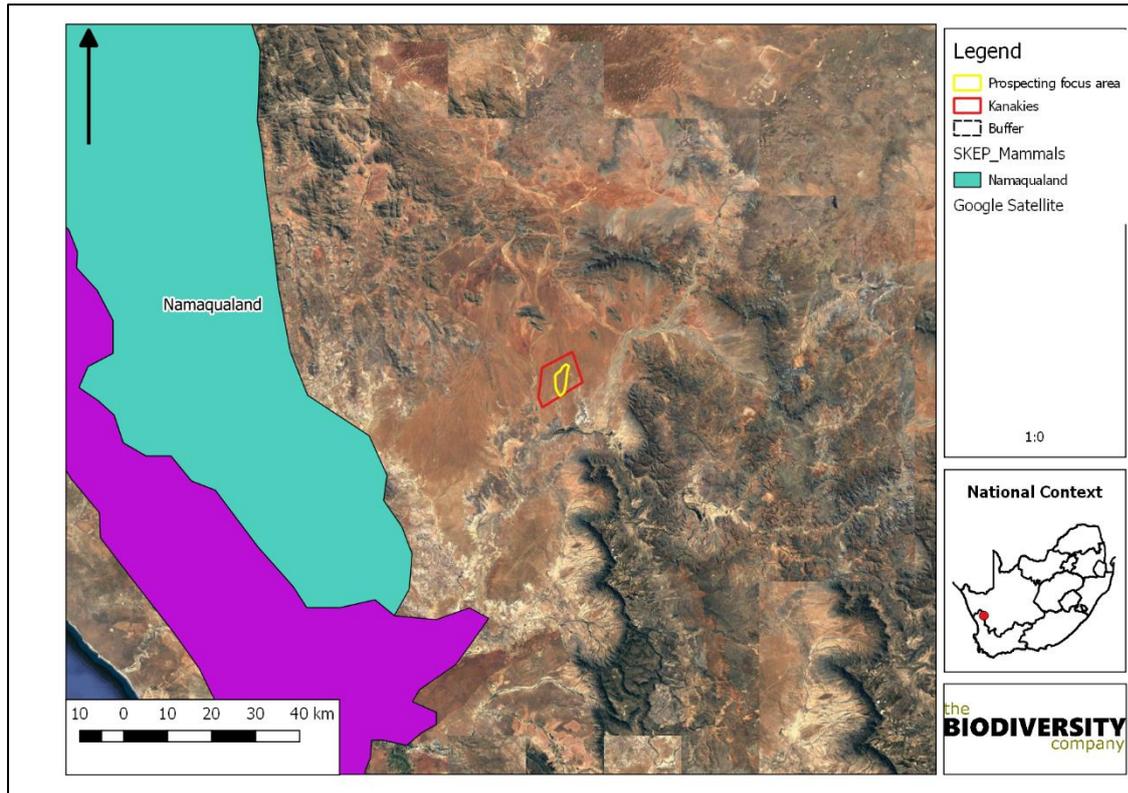


Figure 3: Location of the Kanakies project area in relation to areas of known mammal sensitivity (Driver et al., 2003)

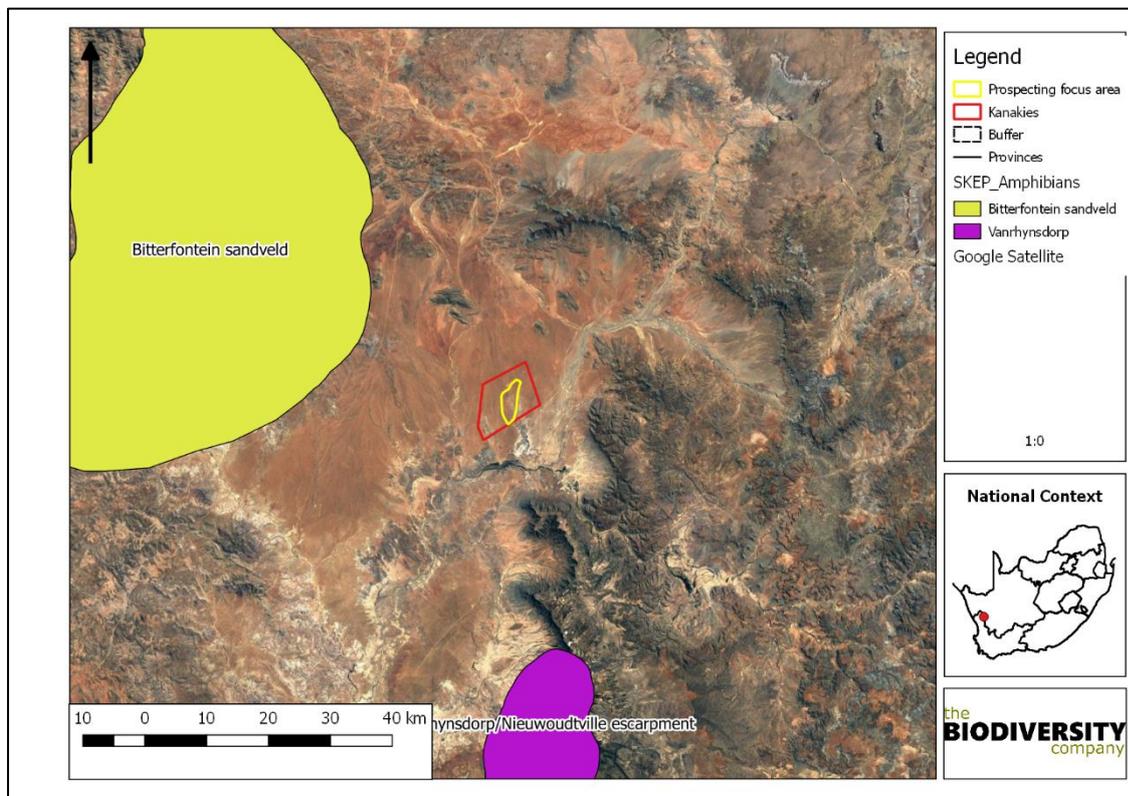


Figure 4: Location of the Kanakies project area in relation to areas of known amphibian importance & sensitivity (Driver et al., 2003)

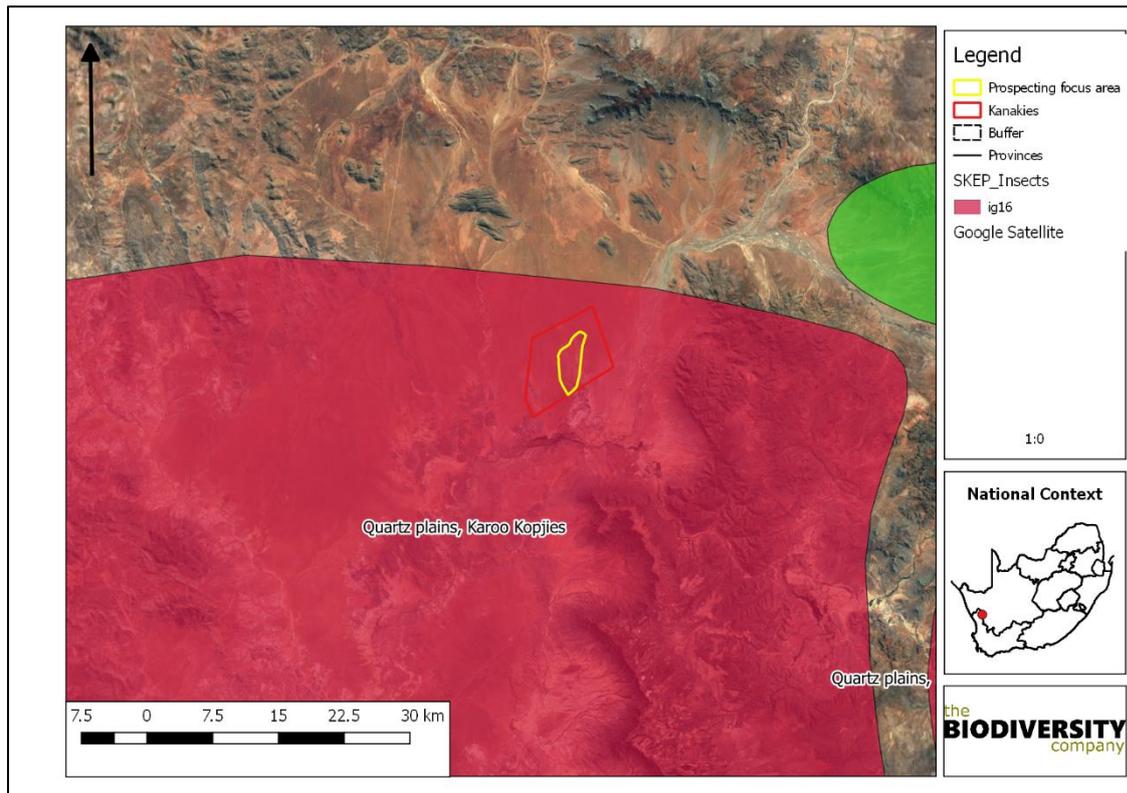


Figure 5: Location of the Kanakies project area in relation to areas of known insect importance & sensitivity (Driver et al., 2003)

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).



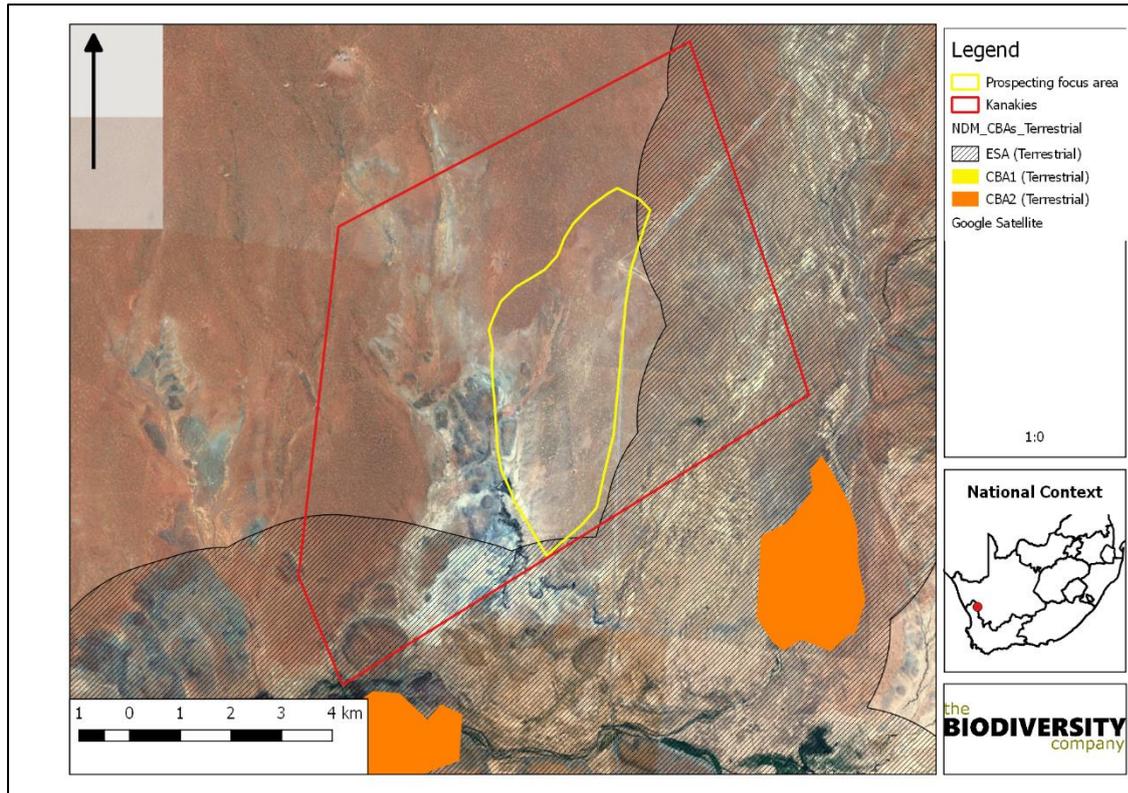


Figure 6: Terrestrial CBA map showing the location of CBA and ESA areas in relation to the Kanakies project area

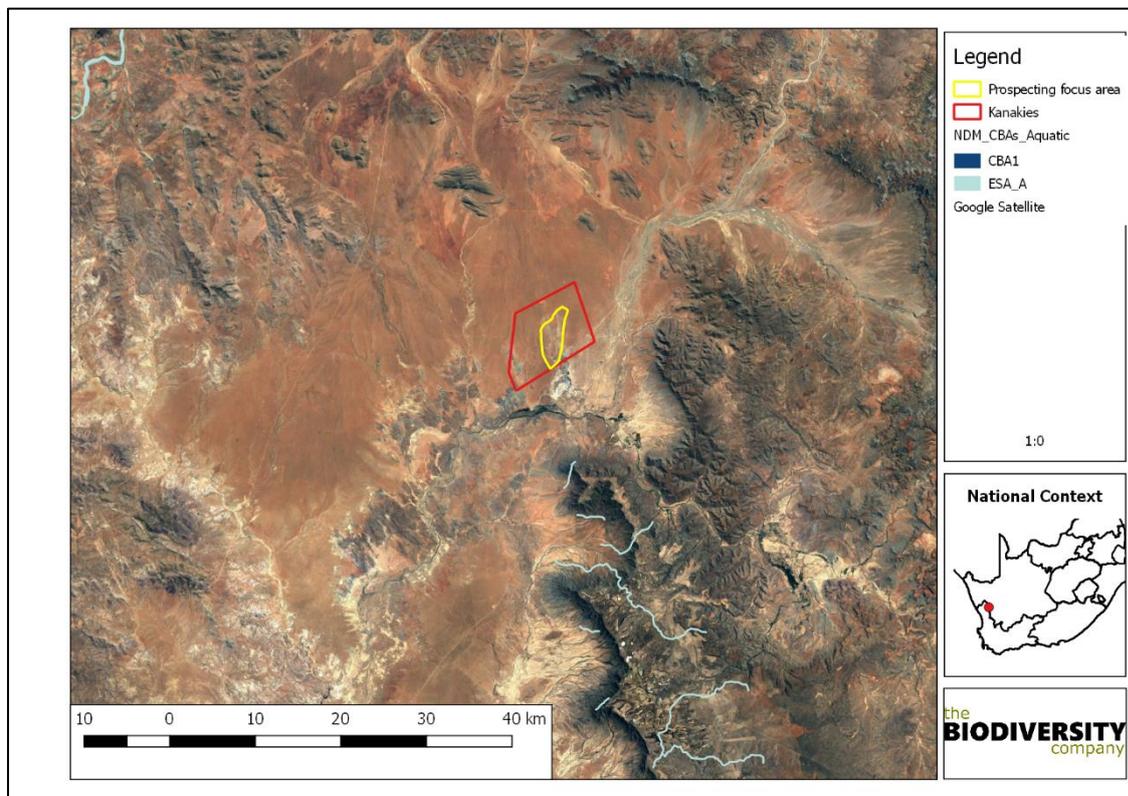


Figure 7: Aquatic CBA map showing the location of CBA and ESA areas in relation to the Kanakies project area

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).

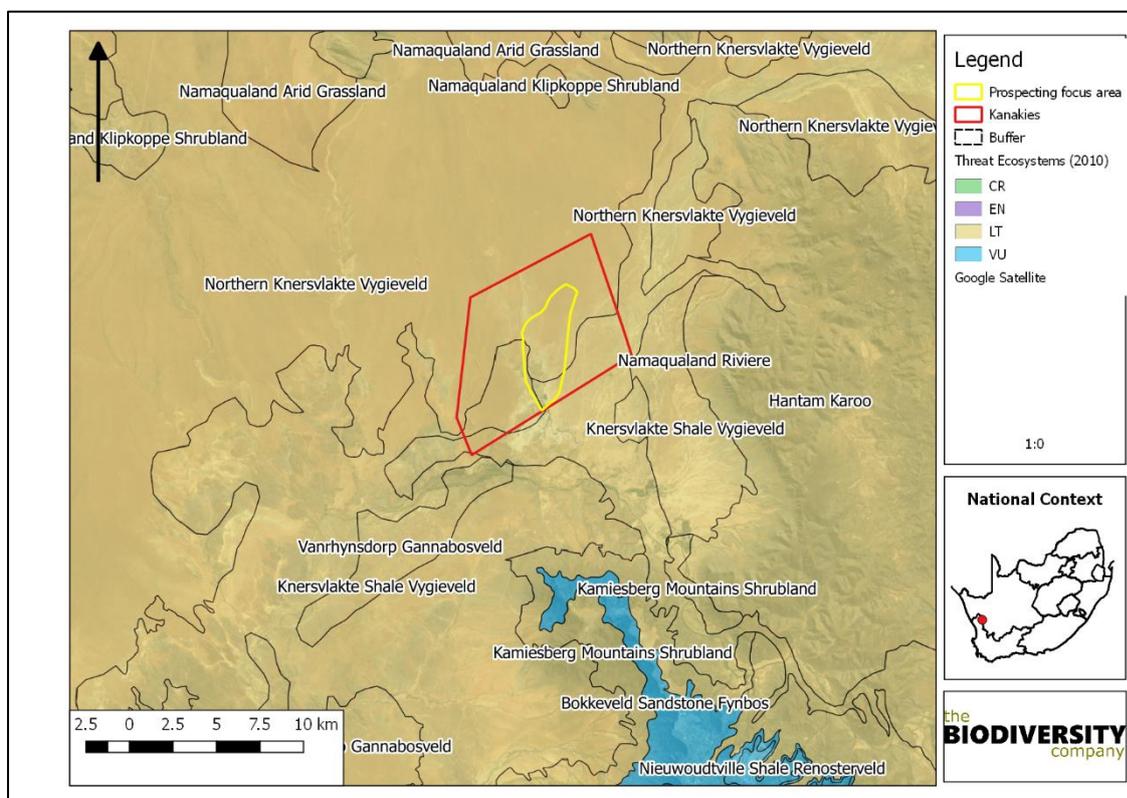


Figure 8: Threat status of the ecosystems associated with Kanakies project area (NBA, 2011)



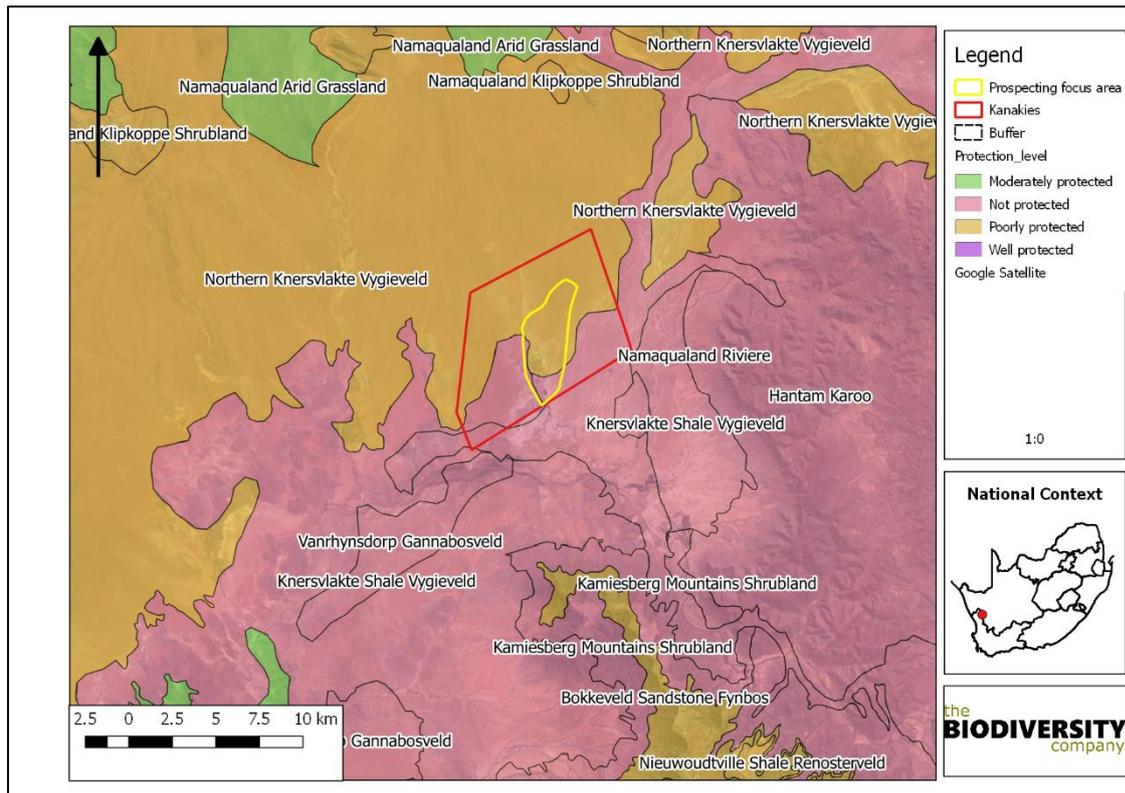


Figure 9: Protection level of the ecosystems associated with the Kanakies project area (NBA, 2011)

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).



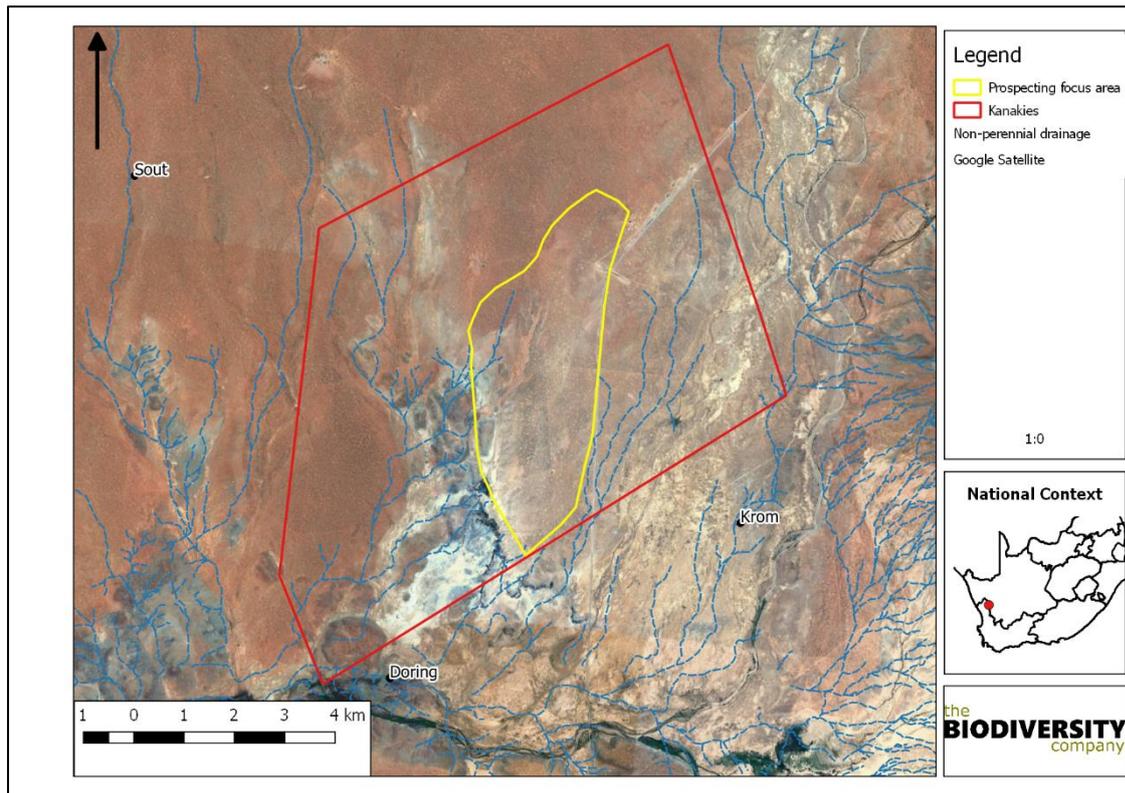


Figure 10: Drainage lines associated with the Kanakies project area

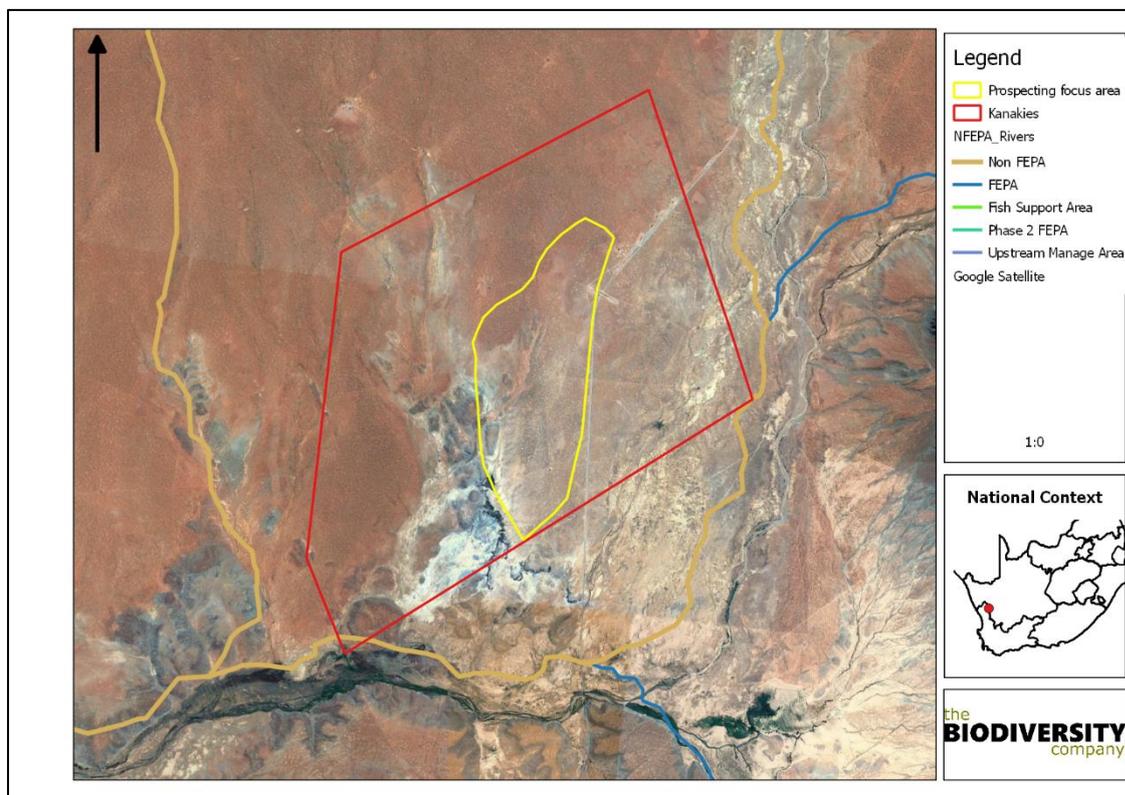


Figure 11: Kanakies project area in relation to river FEPAs

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.

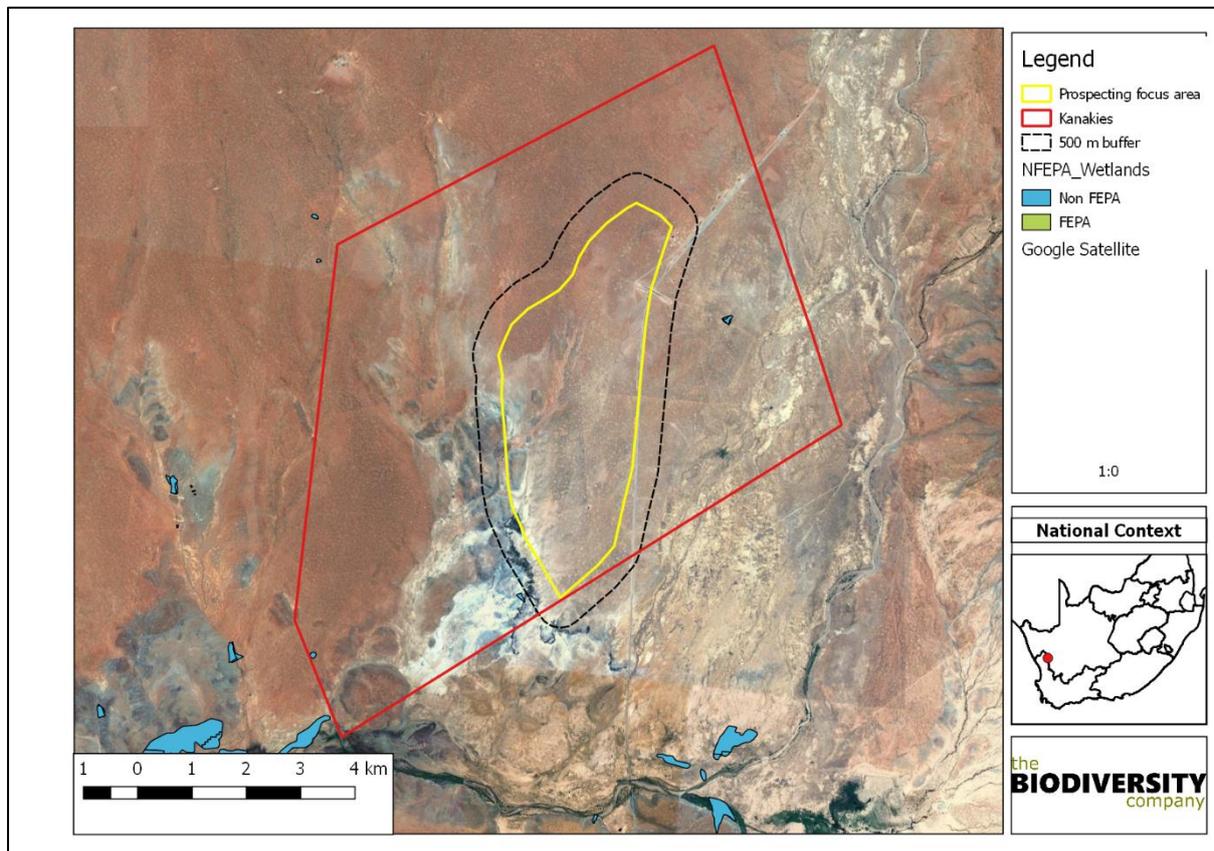


Figure 12: Kanankies project area in relation to wetland FEPAs

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).

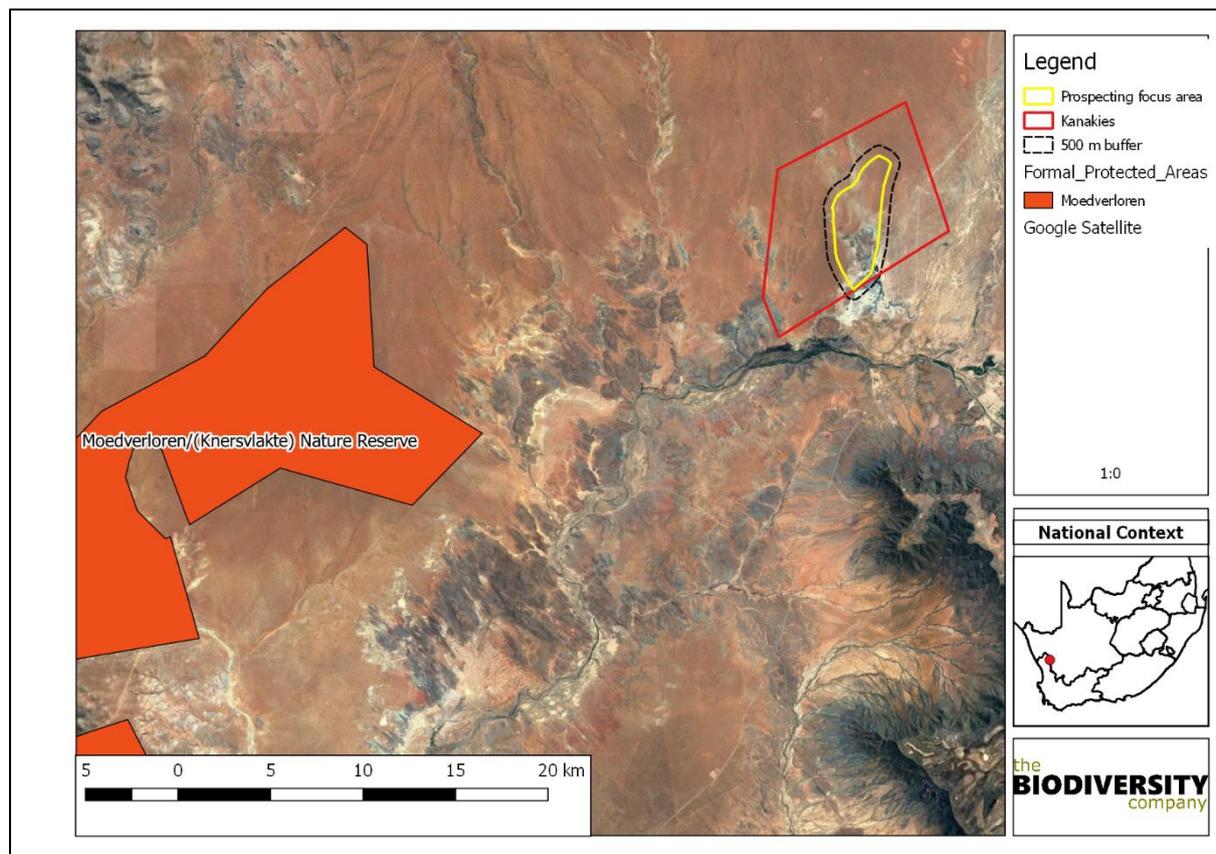


Figure 13: Formally protected areas in relation to the Kanakies project area

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 & 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 encroachment by alien invasive vegetation (Mucina & Rutherford, 2006).

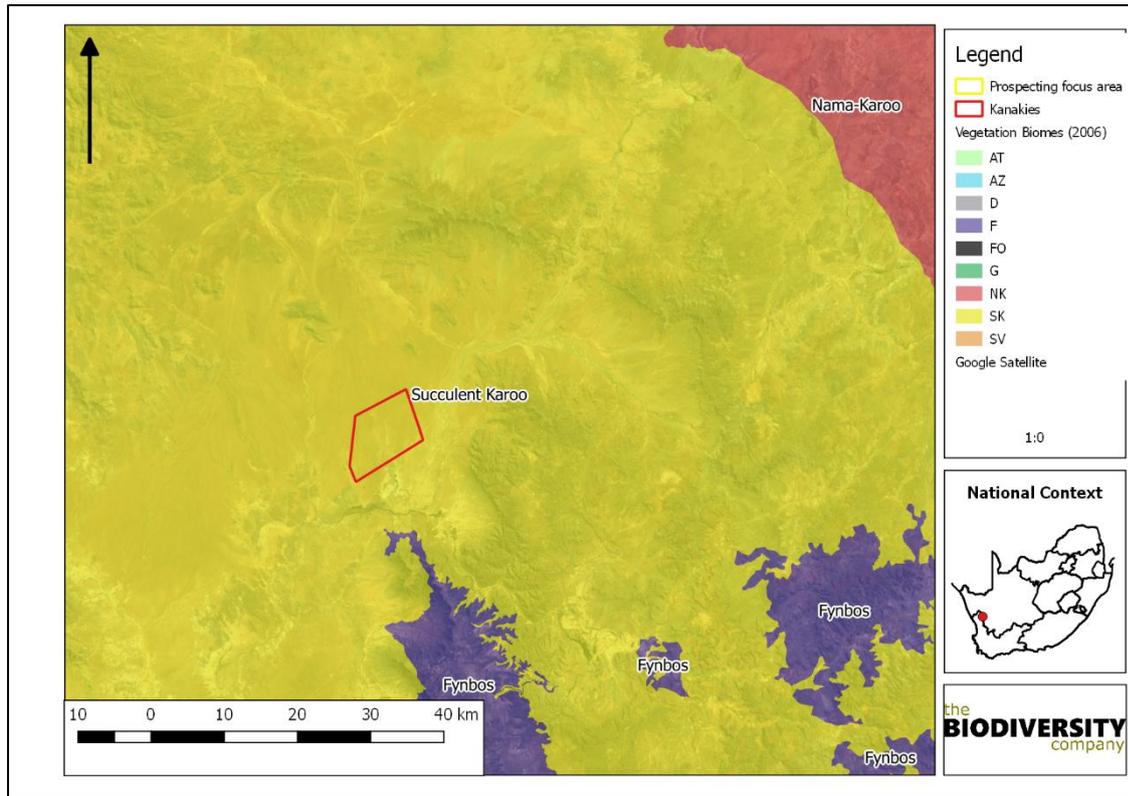


Figure 14: Location of the Kanakies project area within the Succulent Karoo biome

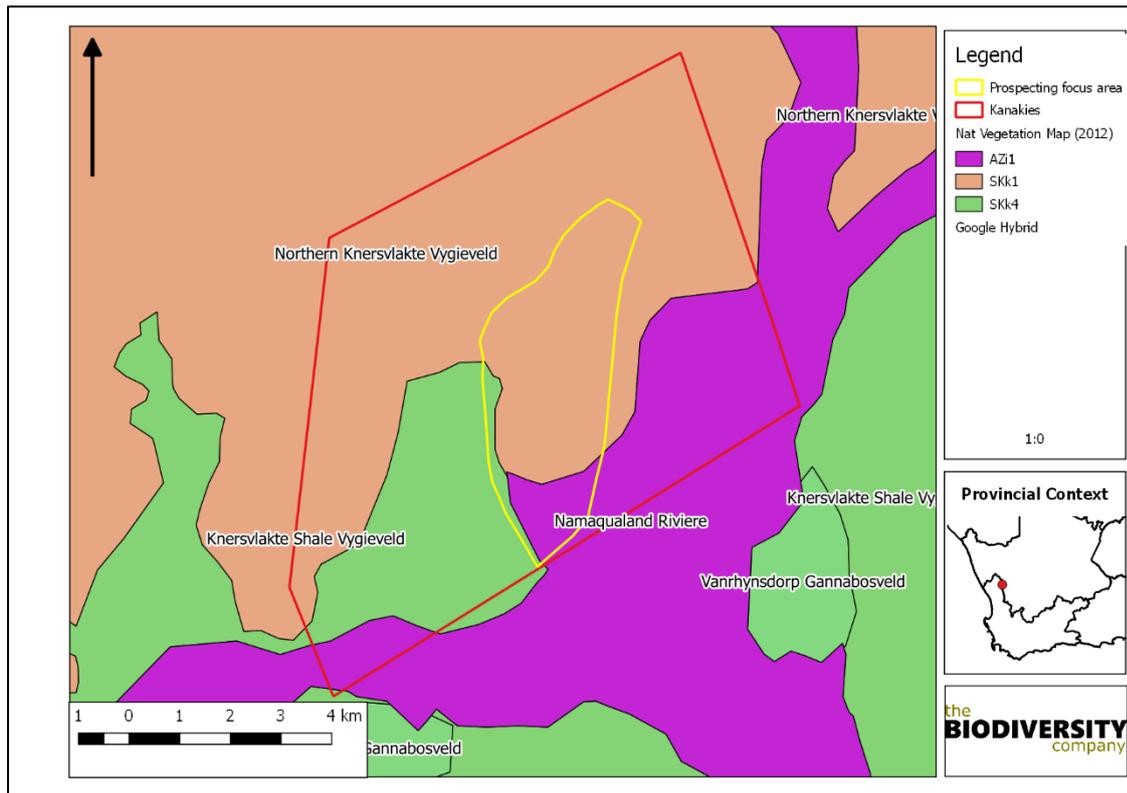


Figure 15: Kanakies project area showing the different vegetation communities (Mucina & Rutherford, 2006)

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



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Species	Threat status	SA Endemic	Likelihood of Occurrence
<i>Strumaria massoniella</i> (D.& U.Müll.-Doblies) Snijman	VU	Yes	Moderate
<i>Tylecodon nolteei</i> Lavranos	VU	Yes	Low
<i>Othonna intermedia</i> Compton	NT	Yes	Low
<i>Babiana vanzijliae</i> L.Bolus	NT	Yes	Unlikely
<i>Lachenalia barkeriana</i> U.Müll.-Doblies, B.Nord. & D.Müll.-Doblies	NT	Yes	Moderate
<i>Leucadendron loranthifolium</i> (Salisb. ex Knight) I. Williams	NT	Yes	Unlikely
<i>Lithops divergens</i> L.Bolus	NT	Yes	Moderate
<i>Oedera multipunctata</i> (DC.) Anderb. & K.Bremer	NT	Yes	Unlikely
<i>Oxalis senecta</i> T.M.Salter	NT	Yes	Moderate
<i>Stapelia paniculata</i> Willd. subsp. <i>paniculata</i>	NT	Yes	Unlikely
<i>Strumaria perryae</i> Snijman	Critically Rare	Yes	Low
<i>Antimima nordenstamii</i> (L.Bolus) H.E.K.Hartmann	Rare	Yes	Low
<i>Argyroderma subalbum</i> (N.E.Br.) N.E.Br.	Rare	Yes	Moderate
<i>Argyroderma theartii</i> Van Jaarsv.	Rare	Yes	Moderate
<i>Babiana pilosa</i> G.J.Lewis	Rare	Yes	Low
<i>Bulbine fallax</i> Poelln.	Rare	Yes	Moderate
<i>Bulbine fragilis</i> G.Will.	Rare	Yes	Low
<i>Bulbine wiesei</i> L.I.Hall	Rare	Yes	Moderate
<i>Cephalophyllum staminodosum</i> L.Bolus	Rare	Yes	Moderate
<i>Crassula multiceps</i> Harv.	Rare	Yes	Moderate
<i>Drosanthemum ramosissimum</i> (Schltr.) L.Bolus	Rare	Yes	Moderate
<i>Ferraria ovata</i> (Thunb.) Goldblatt & J.C.Manning	Rare	Yes	Moderate
<i>Gethyllis gregoriana</i> D.Müll.-Doblies	Rare	Yes	Moderate
<i>Gethyllis lata</i> L.Bolus subsp. <i>lata</i>	Rare	Yes	Moderate
<i>Lachenalia kliprandensis</i> W.F.Barker	Rare	Yes	Low
<i>Moraea fenestrata</i> (Goldblatt) Goldblatt	Rare	Yes	Unlikely
<i>Phyllobolus chrysophthalmus</i> Gerbaulet & Struck	Rare	Yes	Low
<i>Tylecodon tenuis</i> (Toelken) Bruyns	Rare	Yes	Moderate
<i>Ursinia pygmaea</i> DC.	Rare	Yes	Moderate
<i>Dioscorea elephantipes</i> (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 occurrence
		Regional (Eskom, 2016)	Global (IUCN, 2017)	
<i>Circus maurus</i>	Harrier, Black	EN	VU	Moderate
<i>Neotis ludwigii</i>	Bustard, Ludwig's	EN	EN	Good
<i>Polemaetus bellicosus</i>	Eagle, Martial	EN	VU	Low
<i>Afrotis afra</i>	Korhaan, Southern Black	VU	VU	Good
<i>Aquila verreauxii</i>	Eagle, Verreaux's	VU	LC	Good
<i>Ciconia nigra</i>	Stork, Black	VU	LC	Low
<i>Cursorius rufus</i>	Courser, Burchell's	VU	LC	Good
<i>Falco biarmicus</i>	Falcon, Lanner	VU	LC	Good
<i>Sagittarius serpentarius</i>	Secretarybird	VU	VU	Good
<i>Anthropoides paradiseus</i>	Crane, Blue	NT	VU	Low
<i>Calendulauda barlowi</i>	Lark, Barlow's	NT	Unlisted	Low
<i>Certhilauda brevirostris</i>	Lark, Agulhas Long-billed	NT	Unlisted	Low
<i>Eupodotis vigorsii</i>	Korhaan, Karoo	NT	LC	Good
<i>Oxyura maccoa</i>	Duck, Maccoa	NT	NT	Low
<i>Calidris ferruginea</i>	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 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 rated as highly likely to occur in the project area (Table 3). The only exception is *Panthera pardus* (Leopard) which, according to 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 Occurrence
		Regional (SANBI, 2016)	IUCN (2017)	
<i>Felis nigripes</i>	Black-footed Cat	VU	VU	High
<i>Panthera pardus</i>	Leopard	VU	VU	Low
<i>Graphiurus ocellatus</i>	Spectacled Dormouse	NT	LC	High
<i>Parotomys littledalei</i>	Littledale's Whistling Rat	NT	LC	High
<i>Pelea capreolus</i>	Grey Rhebok	NT	LC	High
<i>Poecilogale albinucha</i>	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)
<i>Amellus microglossus</i> DC.	LC	No
<i>Brownanthus vaginatus</i> (Lam.) Chess. & M.Pignal	LC	No
<i>Cephalophyllum framesii</i> L.Bolus	LC	No
<i>Didelta carnosa</i> (L.f.) Aiton var. <i>carnosa</i>	LC	No
<i>Hoodia gordonii</i> (Masson) Sweet ex Decne.	DD	No
<i>Lampranthus uniflorus</i> (L.Bolus) L.Bolus	LC	No
<i>Ruschia spinosa</i>	LC	No
<i>Salsola decussata</i> C.A.Sm. ex Botsch.	LC	No
<i>Stoeberia frutescens</i> (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)
<i>Alopochen aegyptiacus</i>	Goose, Egyptian	Unlisted	LC
<i>Calendulauda albescens</i>	Lark, Karoo	Unlisted	LC
<i>Cercomela schlegelii</i>	Chat, Karoo	Unlisted	LC
<i>Chersomanes albofasciata</i>	Lark, Spike-heeled	Unlisted	LC
<i>Corvus albus</i>	Crow, Pied	Unlisted	LC
<i>Corvus capensis</i>	Crow, Cape	Unlisted	LC
<i>Falco rupicoloides</i>	Kestrel, Greater	Unlisted	LC
<i>Falco rupicolus</i>	Kestrel, Rock	Unlisted	Unlisted



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

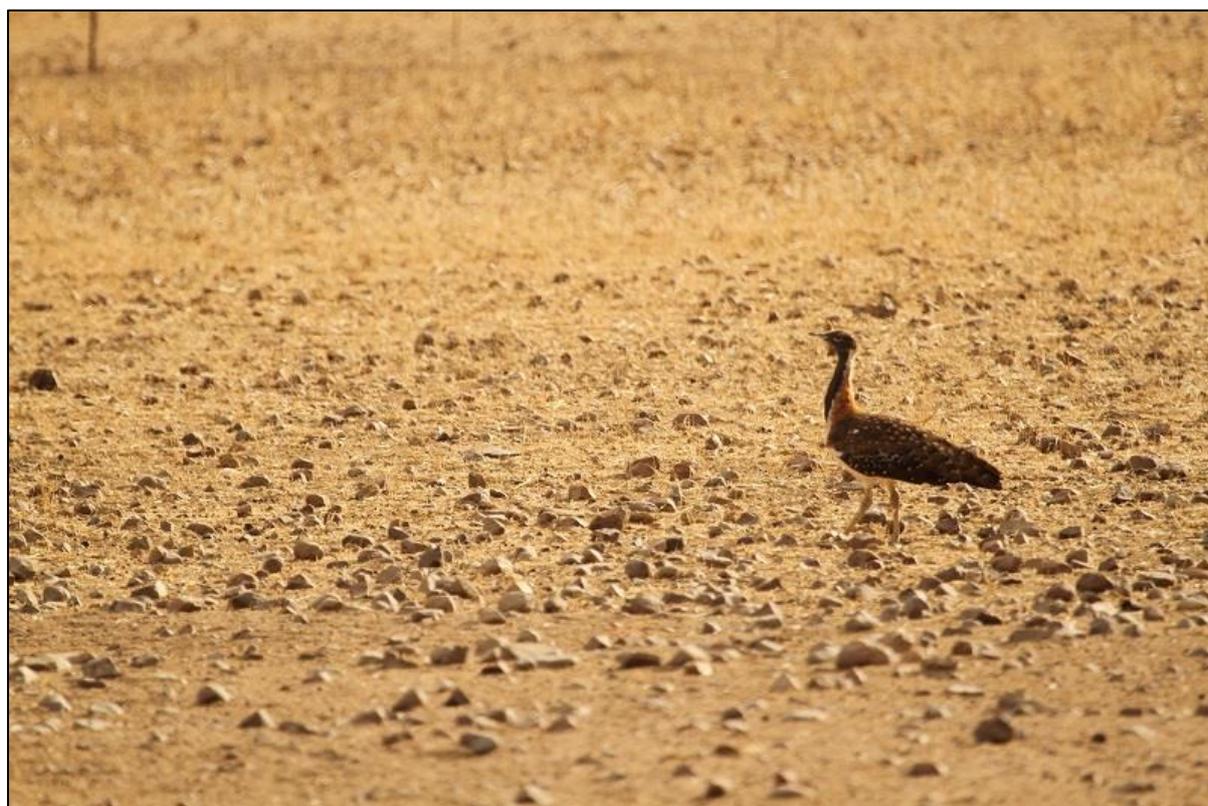


Figure 17: *Neotis ludwigii* (Ludwig's bustard) observed near to Loeriesfontein during the March 2017 survey

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)
<i>Canis mesomelas</i>	Black-backed Jackal	LC	LC
<i>Lepus saxatilis</i>	Scrub Hare	LC	LC
<i>Procavia capensis</i>	Rock Hyrax	LC	LC
<i>Raphicerus campestris</i>	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)

IMPACT DESCRIPTION: Loss of plant species of conservation concern				
Predicted for project phase:		Prospecting		
Dimension	Rating	Motivation		
PRE-MITIGATION				
Duration	Permanent (7)	Permanent destruction of plant species of conservation concern	Consequence: Extremely detrimental (-20)	Significance: Major - negative (-120)
Extent	International (7)	Loss of SA endemic plant species		
Intensity x type of impact	Very high - negative (-6)	Loss of plant species with limited extent of occurrence		
Probability	Highly probable (6)	Construction of roads and clearing of project footprint		
MITIGATION:				
<ul style="list-style-type: none"> - 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 				
POST-MITIGATION				



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)



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Extent	Local (3)	Alien invasive species will most likely become established 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 machinery 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:				
<ul style="list-style-type: none"> - 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 sensitivity, 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.



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APPENDIX A: EXPECTED PLANT SPECIES

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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



APPENDIX B: EXPECTED AVIFAUNAL SPECIES

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



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



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



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



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



APPENDIX C: EXPECTED MAMMAL SPECIES

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



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



APPENDIX D: EXPECTED REPTILE AND AMPHIBIAN SPECIES

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

