Biodiversity Baseline & Impact Assessment for the proposed Droogfontein Solar Photovoltaic (PV 5) Project

Kimberley, Sol Plaatje Local Municipality, Northern Cape Province

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CLIENT

ENVIRONAMICS

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Submitted to	ENVIRONAMICS
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Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.

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1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake a biodiversity baseline and impact assessment for the proposed Droogfontein Solar Photovoltaic (PV) project. The proposed project involves the development of a solar facility and associated infrastructure, located between the towns of Kimberley and Riverton in the Northern Cape province.

The approach was informed by the Environmental Impact Assessment Regulations. 2014 (GNR 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The approach has taken cognisance of the recently published Government Notices 320 (20 March 2020) in terms of NEMA, dated 20 March and 30 October 2020: "*Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation*" (Reporting Criteria). The National Web based Environmental Screening Tool has characterised the terrestrial and aquatic theme sensitivity of the project area as "Very High" and "Low" respectively. The agricultural theme sensitivity has been characterised as "Low" to "Medium".

This report, after taking into consideration the findings and recommendations 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 project.

1.2 Project Description

The following project description is applicable:

- PV Panel Array - To produce up to 200MW direct current and up to 180MW alternating current, the proposed SEF will require numerous linked cells placed behind a protective glass sheet to form a panel. Multiple panels will be required to form the solar PV arrays which will comprise the PV facility. The PV panels will be tilted in order to capture the most sun or using axis tracker structures to follow the sun to increase the Yield;

- Wiring to Inverters - Sections of the PV array will be wired to inverters. The inverter is a pulse width mode inverter that converts direct current (DC) electricity to alternating current (AC) electricity at grid frequency; and

- Connection to the grid - Connecting the array to the electrical grid requires transformation of the voltage from 480V to 33kV to 132kV. The normal components and dimensions of a distribution rated electrical substation will be required. Output voltage from the inverter is approximately 480V and this is fed into step up transformers to 132kV. An onsite facility substation and switching stations will be required on the site to step the voltage up to 132kV, after which the power will be evacuated into the national grid via the proposed new collector substation and power line. The power line route will be assessed within a 300m wide corridor.

  As there are five alternative development areas proposed for the placement of the project development footprint, the developer has identified a suitable grid connection corridor for each of the development areas which connects the facility to an existing power line located near to the development area. All grid connection corridors have a width of 300m. The respective grid connection solutions proposed for each of the alternative development areas are considered to be feasible from a technical and capacity perspective and provides an opportunity for limited linear disturbance within the landscape based on the limited power line infrastructure proposed to be developed (i.e. no power lines longer than 2.5km are required). Refer to the below.

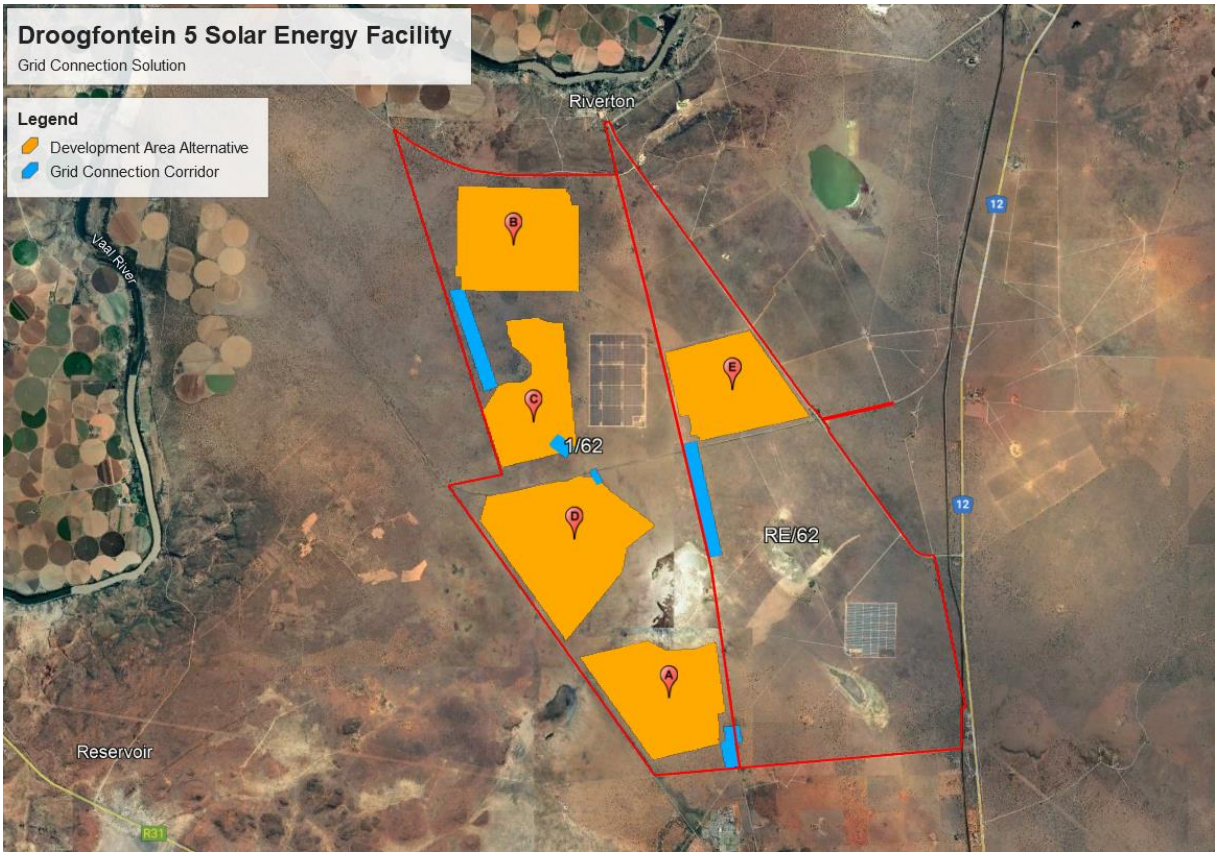


Figure 1-1 Proposed grid connection corridors (indicated in blue) associated with each of the development area options

- Electrical reticulation network – An internal electrical reticulation network will be required and will be lain ~2-4m underground as far as practically possible.
- Supporting Infrastructure – The following auxiliary buildings with basic services including water and electricity will be required:
    - Administration Office (~300m²);
    - Switch gear and relay room (~400m²);
    - Staff lockers and changing room (~200m²);
    - Security control (~60m²);
    - Operations & Maintenance (O&M) room; and
    - Warehouse.
- Battery Energy Storage System (BESS) – The battery energy storage system will make use of Lithium-ion as a preferred technology and will have a capacity of up to 40MW. The extent of the system will be 20m long, 23m high, 2.5m wide. The containers may be single stacked only to reduce the footprint. There may be up to a maximum of 40 containers of BESS. The containers will include cells, HVAC, fire, safety and control systems and will comprise of Lithium-Ion technology providing a maximum capacity of 50MW in total
- Roads – Access will be obtained via the tarred Riverton Road and various gravel farm roads within the area and affected properties. An internal site road network will also be required to provide access to the solar field and associated infrastructure. Roads are expected to be between 8m and 12m wide.

- Fencing - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm. Fencing with a maximum height of 3 meters will be used.

Component	Description / dimensions
Height of PV panels	Up to 3 meters
Area of PV Array	Up to 160 hectares (within the up to 500ha development footprint)
Number of inverters required	To be determined as part of the final facility layout design.
Area occupied by inverter / transformer stations / substations	On-site Facility Substation: up to 3ha Collector Substation: up to 3ha BESS: up to 5ha
Capacity of the on-site substation	33kV / 132kV
Capacity of the collector substation	33kV / 132kV
Capacity of the power line	33kV / 132kV
Area occupied by both permanent and construction laydown areas	Up to 3 hectares
Area occupied by buildings	• Administration Office (~300m²); • Switch gear and relay room (~400m²); • Staff lockers and changing room (~200m²); • Security control (~60m²);
Width of internal roads	Between 8 and 12 meters
Grid connection corridor width	300m
Grid connection corridor length – as associated with each development area alternative	• Option A: up to 600m • Option B: up to 2km • Option C: up to 140m (two power lines of 140m is required) • Option D: up to 145m • Option E: up to 2.3km
Power line servitude width	Up to 32m
Height of fencing	Approximately 3 meters

1.3 Project Area

The project area is located in the Northern Cape Province and falls within the Frances Baard District Municipality and Sol Plaatjie Local Municipality. Kimberly is located approximately 20 km south of the proposed development. The project area can be seen in Figure 1-2 and Figure 1 2, the project area contains all expected infrastructure related to the project.

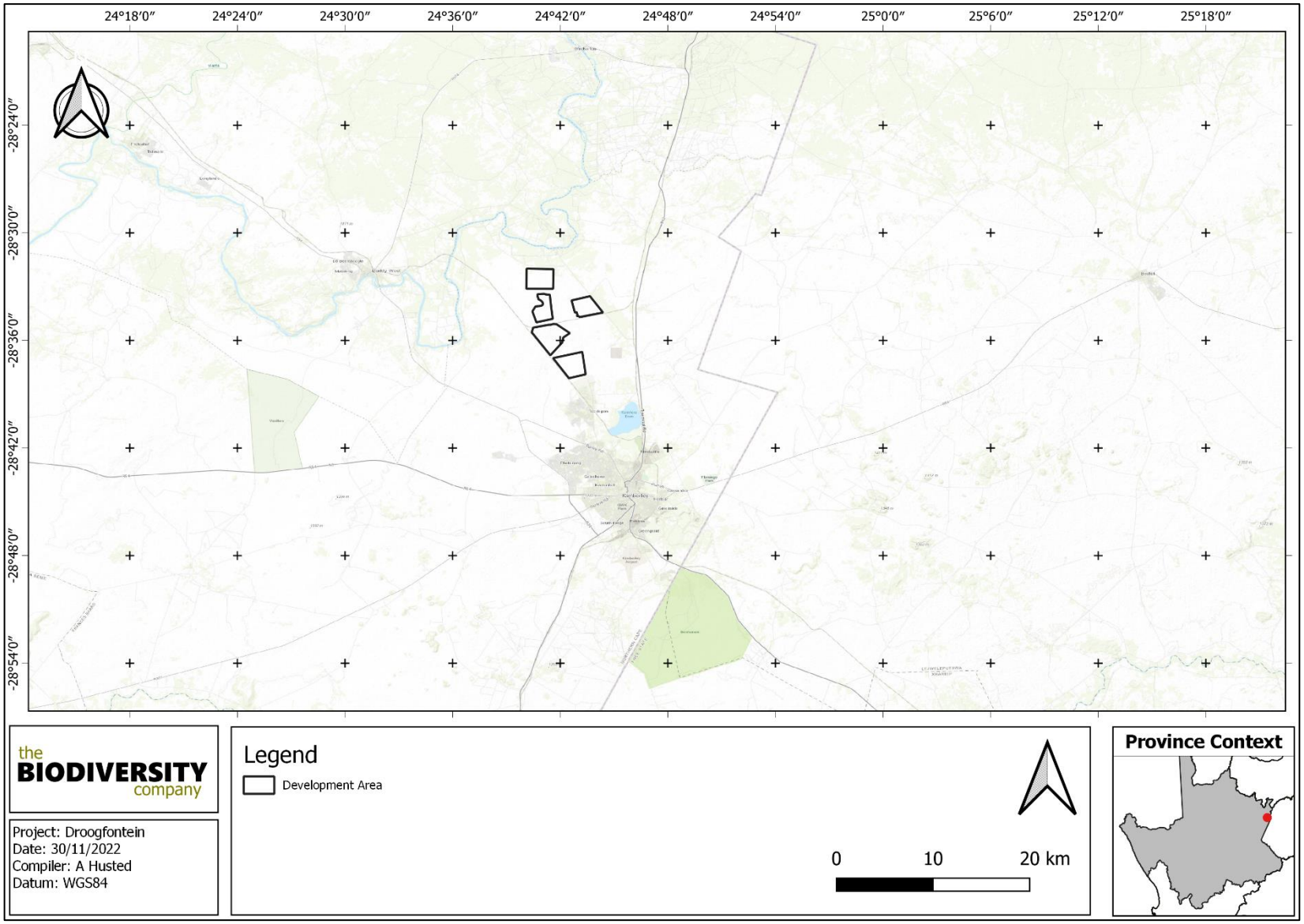


Figure 1-2 Location of the project area

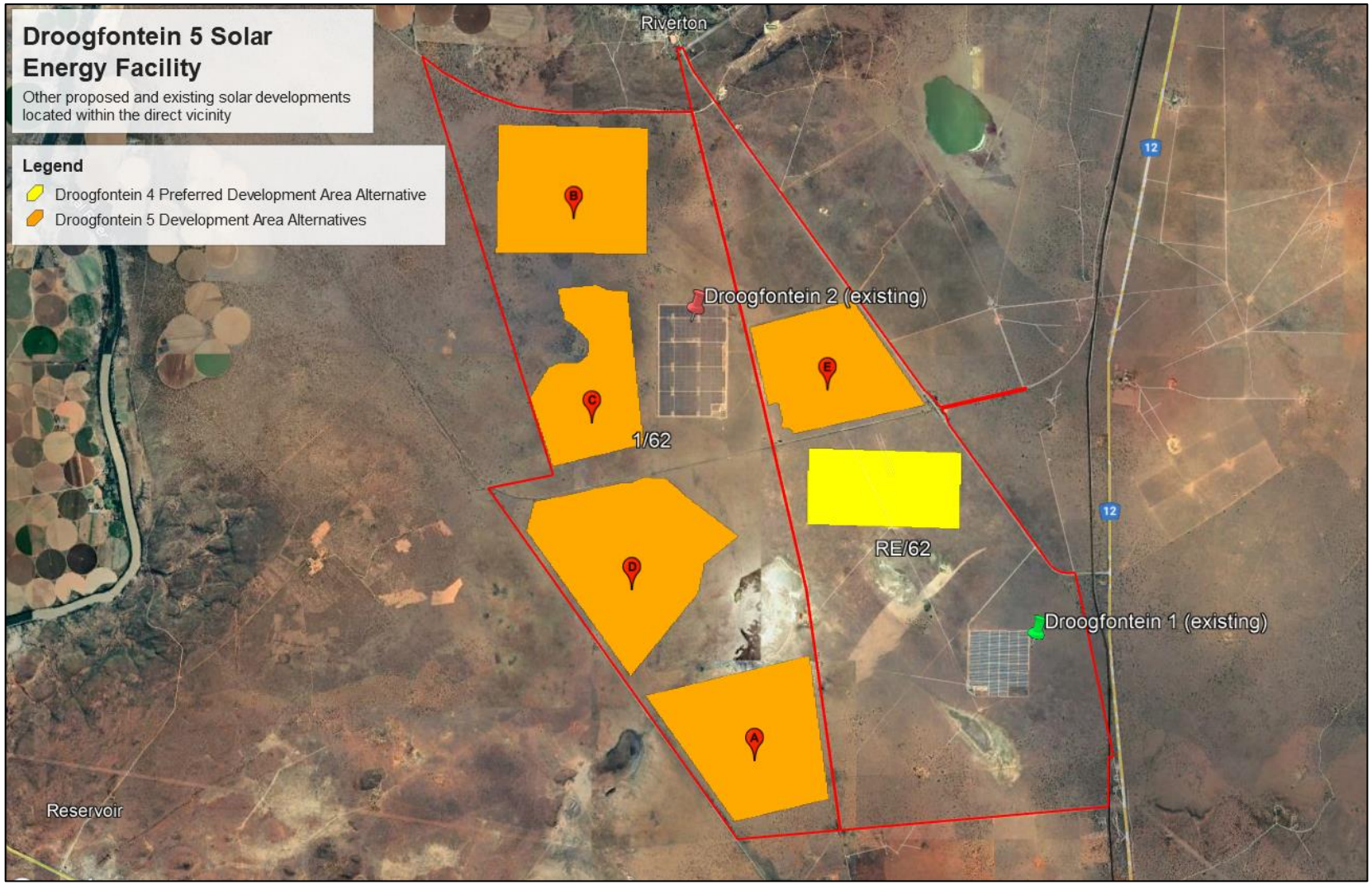


Figure 1-3 ***Map showing the 5 options for the Droogfontein PV 5 development areas in relation to the existing Droogfontein 2 areas as well as the proposed Droogfontein 4 PV area (Provided by Environamics, 2022).***

1.4 Terms of Reference

The Terms of Reference (ToR) included the following:

- Description of the baseline receiving environment specific to the field of expertise (general surrounding area as well as site specific environment);
- Identification and description of any sensitive receptors in terms of relevant specialist disciplines (biodiversity and wetlands) that occur in the project area, and the manner in which these sensitive receptors may be affected by the activity;
- Identify 'significant' ecological, botanical and faunal features within the proposed project areas;
- Identification of conservation significant habitats around the project area which might be impacted;
- Screening to identify any critical issues (potential fatal flaws) that may result in project delays or rejection of the application;
- Provide a map to identify sensitive receptors in the project area, based on available maps and database information;
- Conduct risk assessments relevant to the proposed activity; and
- Impact assessment, mitigation and rehabilitation measures to prevent or reduce the possible impacts.

1.5 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- The assessment area was based on the spatial data provided by the client and any alterations to the route and/or missing GIS information pertaining to the assessment area would have affected the area surveyed;
- The assessment area was only surveyed during a single season visit and therefore, this assessment does not consider temporal trends, however sufficient to derive meaningful baseline;
- Due to the time of sampling (winter) some of the vegetation was dry and most plants had already lost the green summer flush. Also, the spring dominant non-succulent annuals were not detectable;
    - Flora identification is limited due to the lack of aboveground plant parts used to determine species, especially in regard to bulbous plants, the vegetation was dry, and most plants had already lost the green flush;
    - It must be noted that during the survey, only a fraction of the expected geophytes were visible due to their variable emergence patterns; and
- The GPS used in the assessment has an accuracy of 5 m and consequently any spatial features may be offset by 5 m.
- Only a single season survey will be conducted for the respective studies, this would constitute a dry season survey with its limitations;
- Whilst every effort is made to cover as much of the project area as possible, representative sampling is completed and by its nature, it is possible that some plant and animal species that are present across the project area were not recorded during the field investigations.

1.6 Key Legislative Requirements

The legislation, policies and guidelines listed below in Table 1-1 are applicable to the current project. The list below, although extensive, may not be complete and other legislation, policies and guidelines may apply in addition to those listed below.

Table 1-1 A list of key legislative requirements relevant to biodiversity and conservation in the Northern Cape

Region	Legislation / Guideline	Comment
National	The National Environmental Management Act (NEMA) (Act No. 107 of 1998)	Environmental Impact Assessment Regulations. 2014 (GNR 326, 7 April 2017), Appendix 6 requirements
	The National Environmental Management: Biodiversity Act (Act No. 10 of 2004), Threatened or Protected Species Regulations	The protection of species and ecosystems that warrant protection
	Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, GNR 320 of Government Gazette 43310 (March 2020)	The minimum criteria for reporting.
	Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, GNR 1150 of Government Gazette 43855 (October 2020)	Protocol for the specialist assessment and minimum report content requirements.
	The National Environmental Management: Waste Act, 2008 (Act 59 of 2008);	The regulation of waste management to protect the environment.
	National Water Act (NWA) (Act No. 36 of 1998)	The regulation of water uses.
	Alien and Invasive Species Regulations and, Alien and Invasive Species List 20142020, published under NEMBA	The regulation and management of alien invasive species.
	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA)	To provide for control over the utilization of the natural agricultural resources including the vegetation and the combating of weeds and invader plants.
Provincial	Northern Cape Planning and Development Act no. 7 of 1998	To provide for the management and conservation of the province's biophysical environment and protected areas. To inform land use planning, environmental assessments, land and water use authorisations, as well as natural resource management,
	Northern Cape Nature Conservation act no. 9 of 2009	

2 Methods

2.1 Desktop Baseline

The desktop assessment was principally undertaken using a Geographic Information System (GIS) to access the latest available spatial datasets to develop digital cartographs and species lists. These datasets and their date of publishing are provided below.

2.1.1 Ecologically Important Landscape Features

Existing ecologically relevant data layers were incorporated into a GIS to establish how the proposed project might interact with any ecologically important entities. Emphasis was placed around the following spatial datasets:

- National Biodiversity Assessment 2018 (Skowno *et al*, 2019) (NBA) - The purpose of the NBA is to assess the state of South Africa's biodiversity based on best available science, with a view to understanding trends over time and informing policy and decision-making across a range of sectors. The NBA deals with all three components of biodiversity: genes, species, and ecosystems; and assesses biodiversity and ecosystems across terrestrial, freshwater, estuarine and marine environments. The two headline indicators assessed in the NBA are:
    - *Ecosystem Threat Status* – indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition.

- *Ecosystem Protection Level* – indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.

- Protected areas - South Africa Protected Areas Database (SAPAD) (DEA, 2021) – The SAPAD Database contains spatial data pertinent to the conservation of South African biodiversity. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. SAPAD is updated on a continuous basis and forms the basis for the Register of Protected Areas, which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.
- National Protected Areas Expansion Strategy (NPAES) (SANBI, 2016) – The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and therefore, of high importance for biodiversity, climate resilience and freshwater protection.
- Northern Cape Biodiversity Sector Plan;
    - The Northern Cape Department of Environment and Nature Conservation has developed the Northern Cape CBA Map which identifies biodiversity priority areas for the province, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). These biodiversity priority areas, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape as a whole.
    - The identification of Critical Biodiversity Areas for the Northern Cape was undertaken using a Systematic Conservation Planning approach. Available data on biodiversity features (incorporating both pattern and process, and covering terrestrial and inland aquatic realms), their condition, current Protected Areas and Conservation Areas, and opportunities and constraints for effective conservation were collated.
    - The Northern Cape Critical Biodiversity Area (CBA) Map updates, revises and replaces all older systematic biodiversity plans and associated products for the province. These include the:
        - Namakwa District Biodiversity Sector Plan;
        - Cape Fine-Scale Plan (only the extent of the areas in the Northern Cape i.e., Bokkeveld and Nieuwoudtville); and
        - Richtersveld Municipality Biodiversity Assessment.
- South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (Van Deventer *et al.,* 2018) – A SAIIAE was established during the NBA of 2018. It is a collection of data layers that represent the extent of river and inland wetland ecosystem types and pressures on these systems.

2.1.2 Desktop Flora Baseline

The Vegetation of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006) and SANBI (2019) was used to identify the vegetation type that would have occurred under natural or pre-anthropogenically altered conditions. Furthermore, the Plants of Southern Africa (POSA) database was accessed to compile a list of expected flora species within the project area (Figure 2-1). The Red List of South African Plants (Raimondo *et al.,* 2009; SANBI, 2020) was utilized to provide the most current national conservation status of flora species.

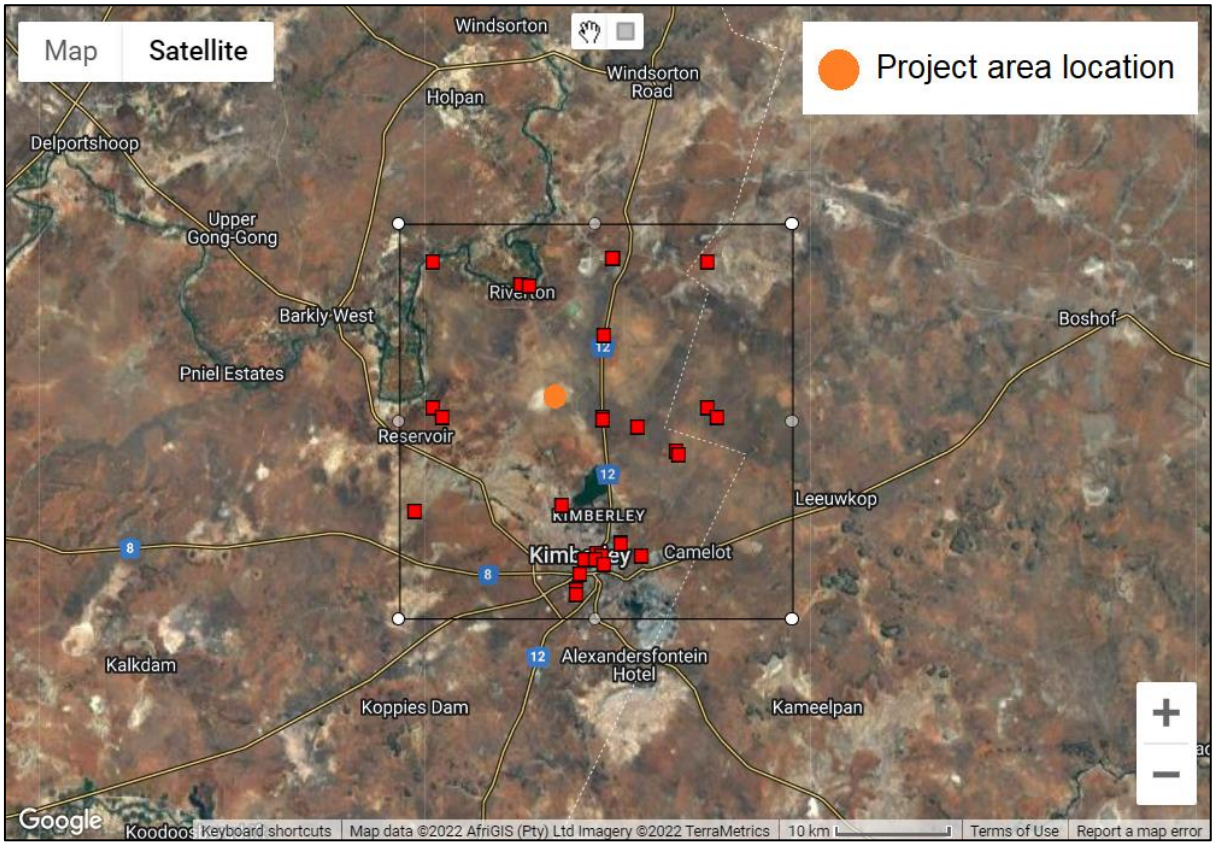


Figure 2-1 ***Map illustrating extent of area used to obtain the expected flora species list from the Plants of South Africa (POSA) database. Orange dot indicates approximate location of the project area. The red squares are cluster markers of botanical records as per POSA data.***

2.1.3 Desktop Faunal Baseline

The faunal desktop assessment comprised of the following, compiling an expected:

- Amphibian list, generated from the IUCN spatial dataset (2017) and FrogMap database (Fitzpatrick Institute of African Ornithology, 2021a), using the 2824 quarter degree square;
- Reptile list, generated from the IUCN spatial dataset (2017) and ReptileMap database (Fitzpatrick Institute of African Ornithology, 2021b), using the 2824 quarter degree square;
- Avifauna list, generated from the SABAP2 dataset by looking at pentads 2830_2435; 2830_2440; 2830_2445; 2835_2435; 2835_2440; 2835_2445; 2840_2435; 2840_2440 and 2840_2445); and
- Mammal list from the IUCN spatial dataset (2017).

2.2 Biodiversity Field Assessment

A single field survey was undertaken in August 2022, which is a dry-season survey, to determine the presence of Species of Conservation Concern (SCC). Effort was made to cover all the different habitat types, within the limits of time and access.

2.2.1 Flora Survey

2.2.1.1 Botanical Baseline

The botanical assessment encompasses an assessment of all the vegetation units and habitat types within the project area. The focus was on an ecological assessment of habitat types as well as identification of any Red Data species within the known distribution of the project area. The South African National Biodiversity Institute (SANBI) provides an electronic database system, namely the Botanical Database of

Southern Africa (BODATSA), to access distribution records on southern African plants. This is a new database which replaces the old Plants of Southern Africa (POSA) database. The POSA database provided distribution data of flora at the quarter degree square (QDS) resolution. The Red List of South African Plants website (SANBI, 2017) was utilized to provide the most current account of the national status of flora. Relevant field guides and texts that were consulted for identification purposes in the field during the surveys included the following:

- Field Guide to the Wild Flowers of the Highveld (Van Wyk & Malan, 1997);
- A field guide to Wild flowers (Pooley, 1998);
- Guide to Grasses of Southern Africa (Van Oudtshoorn, 1999);
- Orchids of South Africa (Johnson & Bytebier, 2015);
- Guide to the Aloes of South Africa (Van Wyk & Smith, 2014);
- Mesembs of the World (Smith *et al*., 1998);
- Medicinal Plants of South Africa (Van Wyk *et al*., 2013);
- Freshwater Life: A field guide to the plants and animals of southern Africa (Griffiths & Day, 2016); and
- Identification guide to southern African grasses. An identification manual with keys, descriptions and distributions (Fish *et al*., 2015).

Additional information regarding ecosystems, vegetation types, and Species of Conservation Concern (SCC) will include the following sources:

- The Vegetation of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2012); and
- Red List of South African Plants (Raimondo *et al*., 2009; SANBI, 2016).

The field work methodology included the following survey techniques:

- Timed meanders;
- Sensitivity analysis based on structural and species diversity; and
- Identification of floral red-data species.

2.2.1.2 Floristic Analysis

The fieldwork and sample sites were placed within targeted areas (i.e. target sites) perceived as ecologically sensitive based on the preliminary interpretation of satellite imagery (Google Corporation) and GIS analysis (which included the latest applicable biodiversity datasets) available prior to the fieldwork. The focus of the fieldwork will therefore be to maximise coverage and navigate to each target site in the field in order to perform a rapid vegetation and ecological assessment at each sample site. Emphasis will be placed on sensitive habitats, especially those overlapping with the proposed project area.

Homogenous vegetation units were subjectively identified using satelite imagery and existing land cover maps. The floristic diversity and search for flora SCC will be conducted through timed meanders within representative habitat units delineated during the scoping fieldwork. Emphasis will be placed mostly on sensitive habitats overlapping with the proposed project area.

The timed random meander method is a highly efficient method for conducting floristic analysis, specifically in detecting flora SCC and maximising floristic coverage. In addition, the method is time and cost effective and highly suited for compiling flora species lists and therefore gives a rapid indication of flora diversity. The timed meander search was performed based on the original technique described by Goff *et al.* (1982). Suitable habitat for SCC will be identified according to Raimondo *et al.* (2009) and targeted as part of the timed meanders.

At each sample site notes were made regarding current impacts (e.g. roads, erosion etc.), subjective recording of dominant vegetation species and any sensitive features (e.g. wetlands, outcrops etc.). In addition, opportunistic observations were made while navigating through the project area.

2.2.2 Fauna Survey

The faunal assessment within this report pertains to herpetofauna (amphibians and reptiles) and mammals. A separate avifauna impact assessment was conducted in April 2022. The faunal field survey comprised of the following techniques:

- *Visual and auditory searches* - This typically comprised of meandering and using binoculars to view species from a distance without them being disturbed; and listening to species calls;
- Active hand-searches - are used for species that shelter in or under particular micro-habitats (typically rocks, exfoliating rock outcrops, fallen trees, leaf litter, bark etc.); and
- Utilization of local knowledge.

Relevant field guides and texts consulted for identification purposes included the following:

- Field Guide to Snakes and other Reptiles of Southern Africa (Branch, 1998);
- A Complete Guide to the Snakes of Southern Africa (Marais, 2004);
- Atlas and Red List of the Reptiles of South Africa, Lesotho and Swaziland (Bates *et al,* 2014);
- A Complete Guide to the Frogs of Southern Africa (du Preez and Carruthers, 2009);
- Smithers' Mammals of Southern Africa (Apps, 2000);
- A Field Guide to the Tracks and Signs of Southern and East African Wildlife (Stuart and Stuart, 2000).

2.3 Terrestrial Site Ecological Importance

The different habitat types within the project area were delineated and identified based on observations during the field assessment, and available satellite imagery. These habitat types were assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of species of conservation concern and their ecosystem processes.

Site Ecological Importance (SEI) is a function of the Biodiversity Importance (BI) of the receptor (e.g., SCC, the vegetation/fauna community or habitat type present on the site) and Receptor Resilience (RR) (its resilience to impacts) as follows.

BI is a function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor as follows. The criteria for the CI and FI ratings are provided in Table 2-1 and Table 2-2, respectively.

Table 2-1 Summary of Conservation Importance (CI) criteria

Conservation Importance	Fulfilling Criteria
Very High	Confirmed or highly likely occurrence of Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Extremely Rare or CR species that have a global extent of occurrence (EOO) of < 10 km^2. Any area of natural habitat of a CR ecosystem type or large area (> 0.1% of the total ecosystem type extent) of natural habitat of an EN ecosystem type. Globally significant populations of congregatory species (> 10% of global population).
High	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km^2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining. Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type. Presence of Rare species. Globally significant populations of congregatory species (> 1% but < 10% of global population).

Medium	Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals. Any area of natural habitat of threatened ecosystem type with status of VU. Presence of range-restricted species. > 50% of receptor contains natural habitat with potential to support SCC.
Low	No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC.
Very Low	No confirmed and highly unlikely populations of SCC. No confirmed and highly unlikely populations of range-restricted species. No natural habitat remaining.

Table 2-2 Summary of Functional Integrity (FI) criteria

Functional Integrity	Fulfilling Criteria
Very High	Very large (> 100 ha) intact area for any conservation status of ecosystem type or > 5 ha for CR ecosystem types. High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches. No or minimal current negative ecological impacts, with no signs of major past disturbance.
High	Large (> 20 ha but < 100 ha) intact area for any conservation status of ecosystem type or > 10 ha for EN ecosystem types. Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches. Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation potential.
Medium	Medium (> 5 ha but < 20 ha) semi-intact area for any conservation status of ecosystem type or > 20 ha for VU ecosystem types. Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.
Low	Small (> 1 ha but < 5 ha) area. Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area. Low rehabilitation potential. Several minor and major current negative ecological impacts.
Very Low	Very small (< 1 ha) area. No habitat connectivity except for flying species or flora with wind-dispersed seeds. Several major current negative ecological impacts.

BI can be derived from a simple matrix of CI and FI as provided in Table 2-3.

Table 2-3 Matrix used to derive Biodiversity Importance (BI) from Functional Integrity (FI) and Conservation Importance (CI)

Biodiversity Importance (BI)		Conservation Importance (CI)				
		Very high	**High**	**Medium**	**Low**	**Very low**
Functional Integrity (FI)	**Very high**	Very high	Very high	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor, as summarised in Table 2-4.

Table 2-4 Summary of Resource Resilience (RR) criteria

Resilience	Fulfilling Criteria
Very High	Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.

High	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Medium	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Low	Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Very Low	Habitat that is unable to recover from major impacts, or species that are unlikely to: (i) remain at a site even when a disturbance or impact is occurring, or (ii) return to a site once the disturbance or impact has been removed.

Subsequent to the determination of the BI and RR, the SEI can be ascertained using the matrix as provided in Table 2-5.

Table 2-5 Matrix used to derive Site Ecological Importance from Receptor Resilience (RR) and Biodiversity Importance (BI)

Site Ecological Importance		Biodiversity Importance (BI)				
		Very high	**High**	**Medium**	**Low**	**Very low**
Receptor Resilience (RR)	Very Low	Very high	Very high	High	Medium	Low
	Low	Very high	Very high	High	Medium	Very low
	Medium	Very high	High	Medium	Low	Very low
	High	High	Medium	Low	Very low	Very low
	Very High	Medium	Low	Very low	Very low	Very low

Interpretation of the SEI in the context of the proposed project is provided in Table 2-6.

Table 2-6 Guidelines for interpreting Site Ecological Importance in the context of the proposed development activities

Site Ecological Importance	Interpretation in relation to proposed development activities
Very High	Avoidance mitigation – no destructive development activities should be considered. Offset mitigation not acceptable/not possible (i.e., last remaining populations of species, last remaining good condition patches of ecosystems/unique species assemblages). Destructive impacts for species/ecosystems where persistence target remains.
High	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Low	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Very Low	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

The SEI evaluated for each taxon can be combined into a single multi-taxon evaluation of SEI for the assessment area. Either a combination of the maximum SEI for each receptor should be applied, or the SEI may be evaluated only once per receptor but for all necessary taxa simultaneously. For the latter, justification of the SEI for each receptor is based on the criteria that conforms to the highest CI and FI, and the lowest RR across all taxa.

3 Results & Discussion

3.1 Desktop Baseline

3.1.1 Ecologically Important Landscape Features

The GIS analysis pertaining to the relevance of the proposed project to ecologically important landscape features is summarised in Table 3-1.

Table 3-1 Summary of relevance of the proposed project to ecologically important landscape features.

Desktop Information Considered	Relevant/Irrelevant	Section
Ecosystem Threat Status	Relevant – Both Options overlap with a Least Concern ecosystem.	3.1.1.1
Ecosystem Protection Level	Relevant – Both Options overlap with a Poorly Protected Ecosystem.	3.1.1.2
Critical Biodiversity Area	Relevant – Both Options overlap with an ONA	3.1.1.3
Renewable Energy Development Zones	Relevant – Both Options overlap with "Approved" areas	3.1.1.4
Powerline Corridor	Relevant – Option A overlaps marginally with the Central Corridor.	3.1.1.5
REDZ	Relevant – Both Options overlap within the Kimberley Solar Renewable Energy Development Zone (Phase 1).	3.1.1.6
South African Inventory of Inland Aquatic Ecosystems	Irrelevant – No Options overlap with any NBA wetlands. Some LC wetlands occur in close proximity	3.1.1.7
National Freshwater Priority Area	Irrelevant – No Options overlap with any NFEPA wetlands. Some wetlands occur in close proximity	3.1.1.8
Strategic Water Source Areas	Irrelevant- The project area is 277 km from the closest SWSA.	-
Protected Areas	Irrelevant – The nearest protected area (Tarentaalrand Safari Lodge) is located approximately 11 km from the project area.	-
National Protected Areas Expansion Strategy	Irrelevant – The project area is located 11 km from the nearest NPAES Protected Areas.	-

3.1.1.1 Ecosystem Threat Status

The Ecosystem Threat Status is an indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. According to the spatial dataset the proposed project overlaps with a LC ecosystem (Figure 3-1).

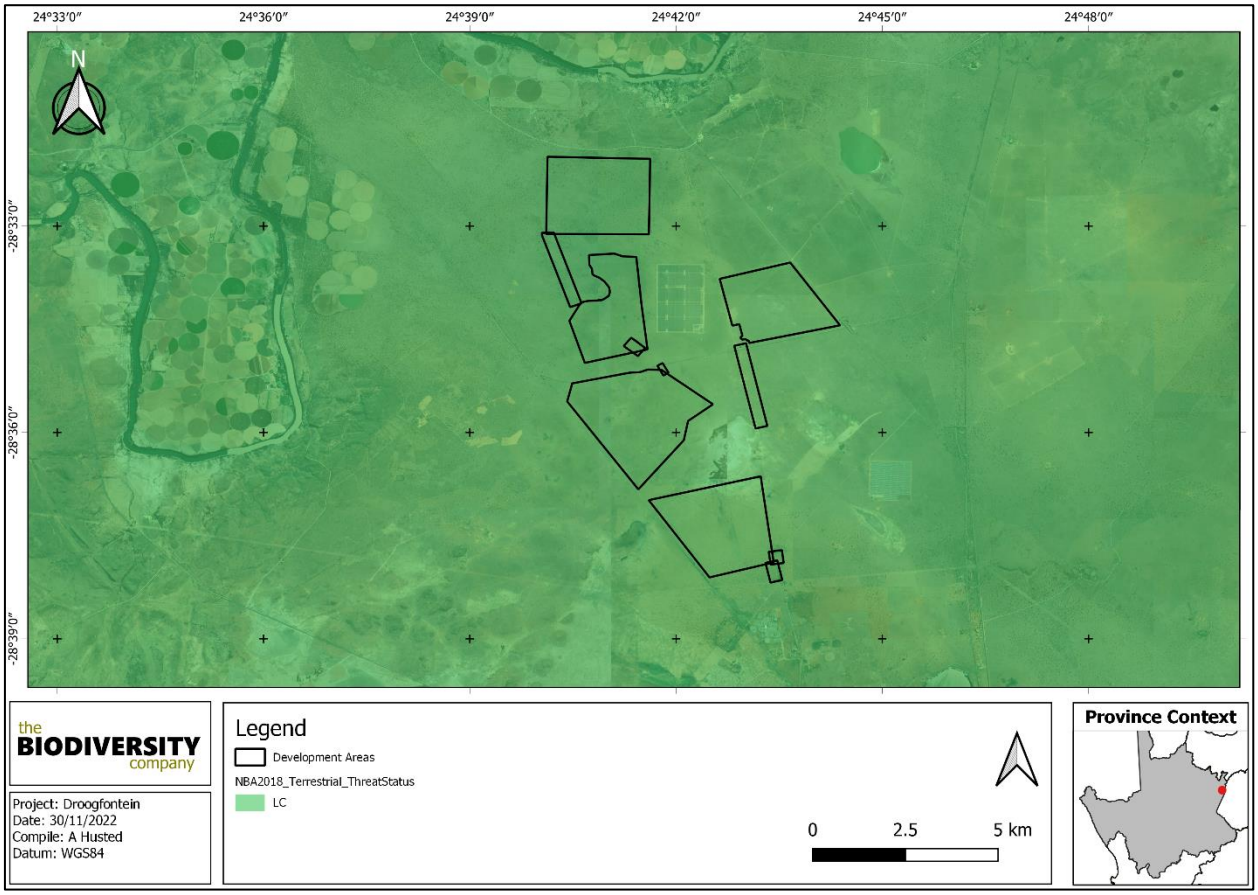


Figure 3-1 Map illustrating the ecosystem threat status associated with the project area

3.1.1.2 Ecosystem Protection Level

This is an indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems. The proposed project overlaps with a PP ecosystem (Figure 3-2).

Figure 3-2 Map illustrating the ecosystem protection level associated with the project area

3.1.1.3 Critical Biodiversity Areas and Ecological Support Areas

The conservation of CBAs is crucial, in that if these areas are not maintained in a natural or near-natural state, biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (SANBI-BGIS, 2017).

The purpose of the Northern Cape BSP (2016) is to inform land-use planning and development on a provincial scale and to aid in natural resource management. One of the outputs is a map of Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). These are classified into different categories, namely CBA1 areas, CBA2 areas, ESA areas and Other Natural Areas (ONAs) based on biodiversity characteristics, spatial configuration, and requirements for meeting targets for both biodiversity patterns and ecological processes.

Figure 3-3 shows the project area superimposed on the Terrestrial CBA maps. The project area overlaps mainly with an ONA and marginally with a CBA1 and a CBA2.

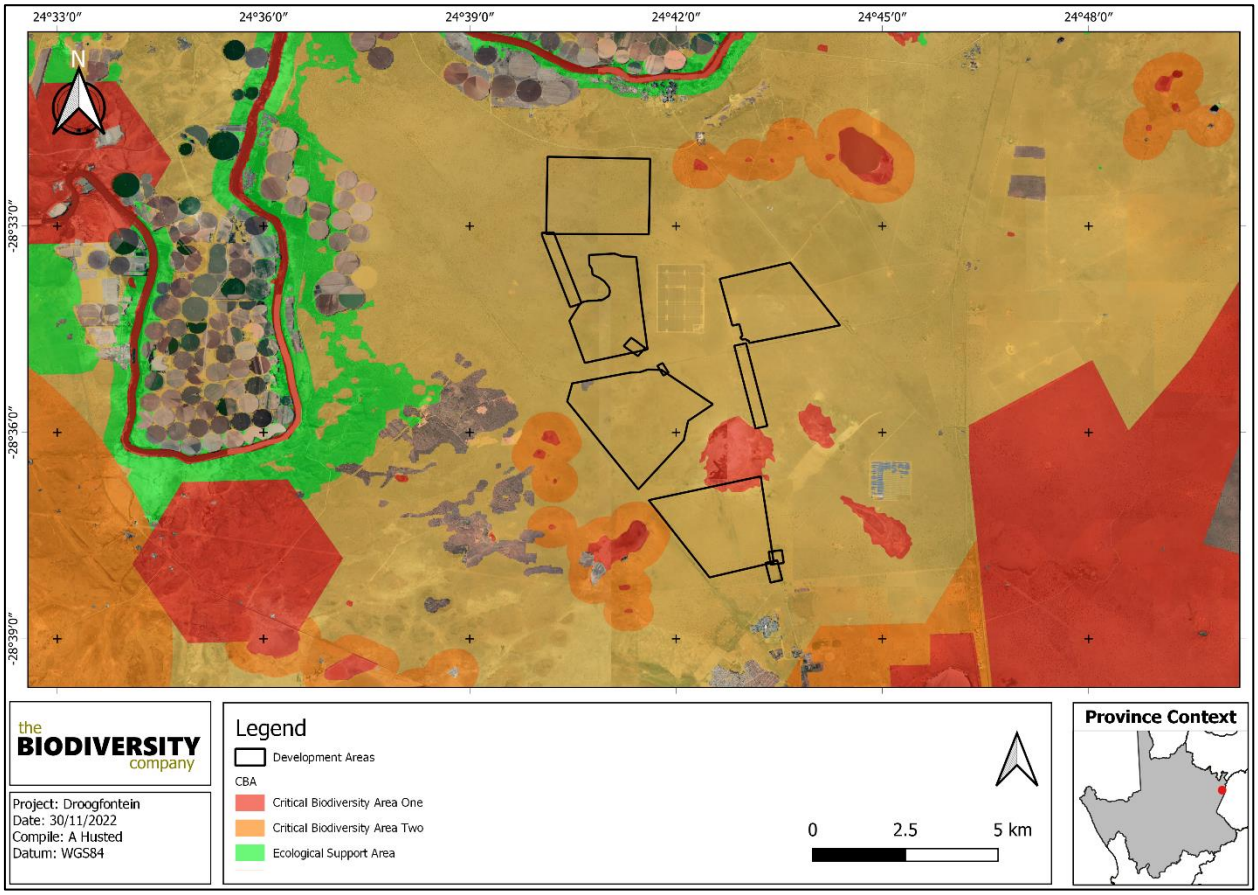


Figure 3-3 Map illustrating the locations of CBAs in the project area

3.1.1.4 Renewable Energy Database

The Renewable Energy Database (http://egis.environment.gov.za/), shows that there are limited other projects in the near vicinity (Figure 3-4). This reduces the overall impact on the habitats in the area. "Approved" projects overlap with the project area.

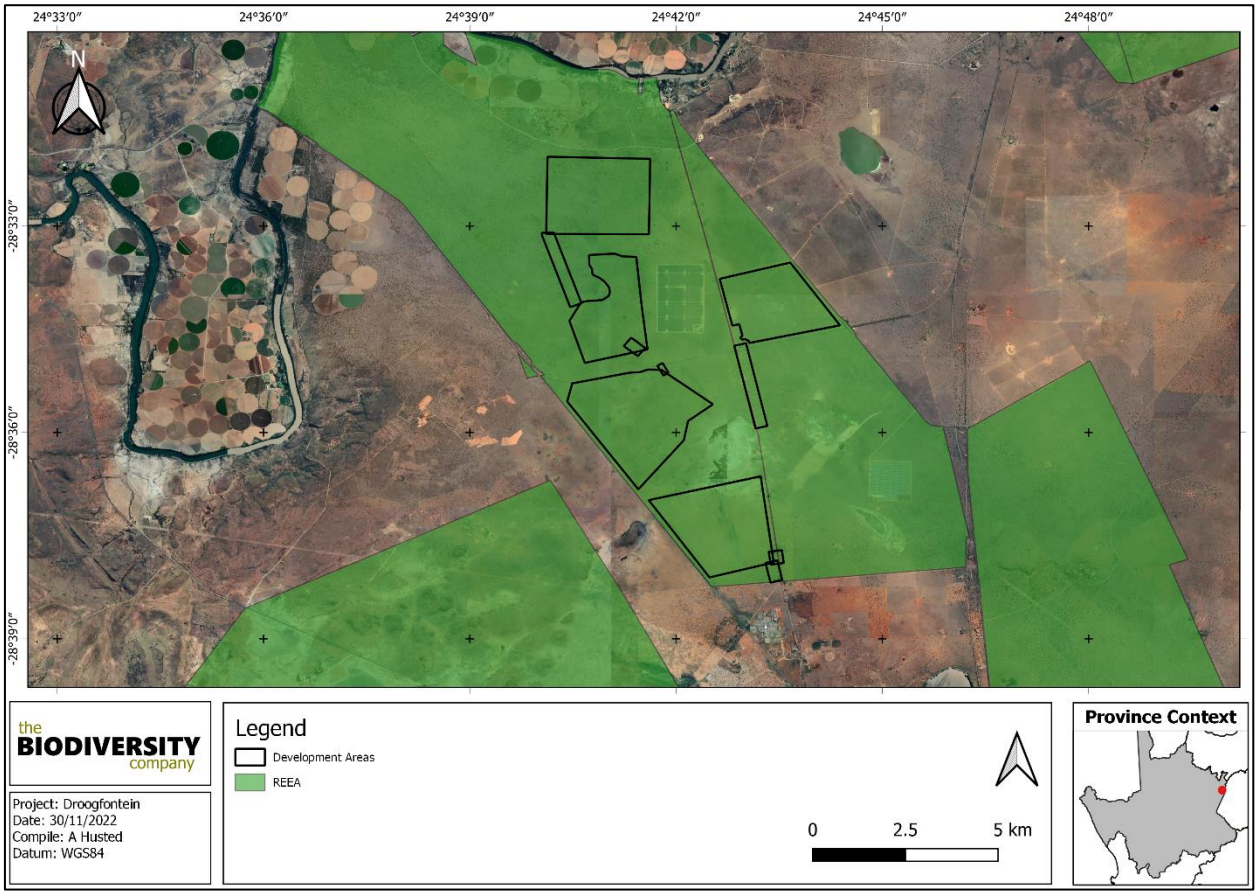


Figure 3-4 The project area in relation to the renewable energy database projects in the area.

3.1.1.5 Strategic Transmission Corridors (EGI)

On the 16 February 2018 minister Edna Molewa published Government Notice No. 113 in Government Gazette No. 41445 which identified 5 strategic transmission corridors important for the planning of electricity transmission and distribution infrastructure as well as procedure to be followed when applying for environmental authorisation for electricity transmission and distribution expansion when occurring in these corridors.

On 29 April 2021, Minister Barbara Dallas Creecy published Government Notice No. 383 in Government Gazette No. 44504, which expanded the eastern and western transmission corridors and gave notice of the applicability of the application procedures identified in Government Notice No. 113, to these expanded corridors. More information on this can be obtained from https://egis.environment.gov.za/egi.

Figure 3-5 shows the Option A proximal o the Central EGI corridor.

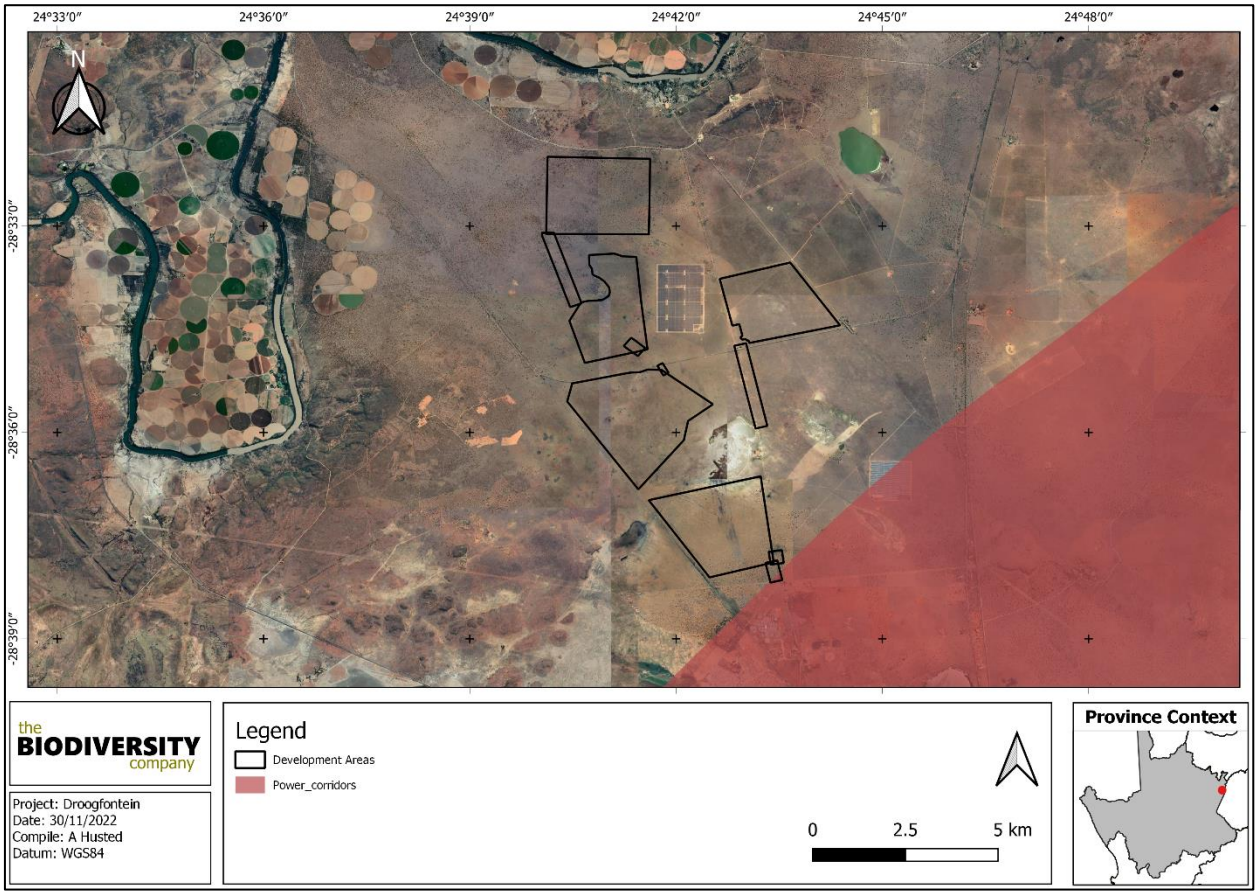


Figure 3-5 The project area in relation to the strategic transmission corridors

3.1.1.6 Renewable Energy Development Zones (REDZ)

In 2018 the Government Notice No. 114 in Government Gazette No. 41445 was published where 8 renewable energy development zones important for the development of large-scale wind and solar photovoltaic facilities were identified. In 2021 an additional 3 sites were included. The REDZs were identified through the undertaking of 2 Strategic Environmental Assessments.

More detailed information can be obtained from https://egis.environment.gov.za/redz. Information here includes the Government Notice No. 142, 144 and 145 in Government Gazette No. 44191 that specifies the procedures to be followed when applying for environmental authorisation for electricity transmission or distribution infrastructure or large-scale wind and solar photovoltaic energy facilities in these REDZs.

The project area falls within the Kimberly Solar REDZ (Figure 3-6).

Figure 3-6 The project area in relation to the Renewable Energy Development Zone spatial data.

3.1.1.7 Hydrological Setting

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the NBA 2018. Ecosystem threat status (ETS) of river and wetland ecosystem types are based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LT, with CR, EN and VU ecosystem types collectively referred to as 'threatened' (Van Deventer *et al.,* 2019; Skowno *et al.,* 2019).

No Options overlap with any NBA wetlands. Some LC wetlands occur in proximity (Figure 3-7).

Figure 3-7 Map illustrating ecosystem threat status of rivers and wetland ecosystems in the project area

3.1.1.8 National Freshwater Ecosystem Priority Area Status

In an attempt to better conserve aquatic ecosystems, South Africa has 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's (NEM:BA) biodiversity goals (Nel *et al.,* 2011).

Figure 3-8 shows no Options overlap with any NFEPA wetlands. Some wetlands occur in close proximity

Figure 3-8 The project area in relation to the National Freshwater Ecosystem Priority Areas

3.1.2 Flora Assessment

This section is divided into a description of the vegetation type expected to occur under natural conditions and the expected flora species.

3.1.2.1 Vegetation Type

This section pertains to the updated SANBI vegetation map of 2019, with the Vegetation Type descriptions by Mucina & Rutherford, 2006 (which are unchanged) for the relevant vegetation type in this report.

The project area is situated in the Savanna biome. The savanna vegetation of South Africa represents the southernmost extension of the most widespread biome in Africa (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the Savanna biome include a seasonal precipitation and a sub-tropical thermal regime with no or usually low incidence of frost (Mucina & Rutherford, 2006).

The savanna biome is the largest biome in South Africa, extending throughout the east and north-eastern areas of the country. Savannas are characterised by a dominant grass layer, over-topped by a discontinuous, but distinct woody plant layer (Mucina & Rutherford, 2006). At a structural level, Africa's savannas can be broadly categorised as either fine-leaved (microphyllous) savannas or broad-leaved savannas. Fine-leaved savannas typically occur on nutrient rich soils and are dominated by microphyllous woody plants of the Mimosaceae family (Common genera include *Vachellia* and *Albizia*) and a generally dense herbaceous layer (Scholes & Walker, 1993).

On a fine-scale vegetation type, the project area overlaps with the Kimberley Thornveld vegetation type (Figure 3-9).

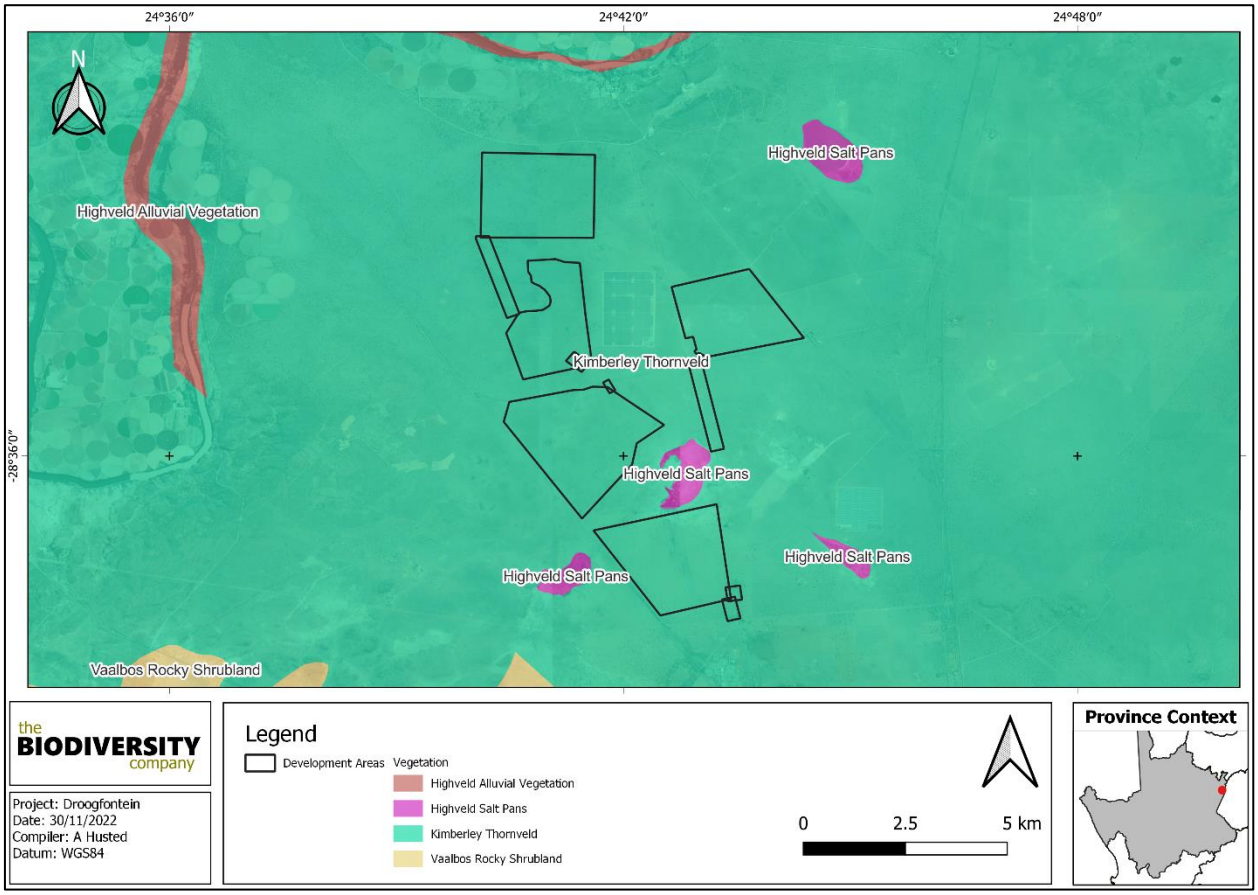


Figure 3-9 Map illustrating the vegetation type associated with the project area

3.1.2.1.1 Kimberley Thornveld

Kimberley Thornveld is distributed across the North-West, Free State and Northern Cape Provinces. It covers most of the Kimberley, Hartswater, Bloemhof and Hoopstad Districts as well as substantial parts of the Warrenton, Christiana, Taung, Boshof and to some extent the Barkly West Districts. Altitudes range from 1 050 to 1 400 m (Mucina & Rutherford, 2006).

Important Plant Taxa in the Kimberley Thornveld (d = dominant)

Based on Mucina and Rutherford's (2006) vegetation classification, important plant taxa are those species that have a high abundance, a frequent occurrence (not being particularly abundant) or are prominent in the landscape within a particular vegetation type. They note the following species are important taxa in the Kimberley Thornveld vegetation type:

Tall Tree: *Vachellia erioloba* (d).

Small Trees: *Vachellia karroo* (d), *V. mellifera* subsp. *detinens* (d), *V. tortilis* subsp. *heteracantha* (d), *Searsia lancea*.

Tall Shrubs: *Tarchonanthus camphoratus* (d), *Diospyros pallens*, *Ehretia rigida* subsp. *rigida*, *Euclea crispa* subsp. *ovata*, *Grewia flava*, *Lycium arenicola*, *L. hirsutum*, *Searsia tridactyla*.

Low Shrubs: *Vachellia hebeclada* subsp. *hebeclada* (d), *Anthospermum rigidum* subsp. *pumilum*, *Helichrysum zeyheri*, *Hermannia comosa*, *Lycium pilifolium*, *Melolobium microphyllum*, *Pavonia burchellii*, *Peliostomum leucorrhizum*, *Plinthus sericeus*, *Wahlenbergia nodosa*.

Succulent Shrubs: *Aloe hereroensis* var. *hereroensis*, *Lycium cinereum*.

Graminoids: *Eragrostis lehmanniana* (d), *Aristida canescens*, *A. congesta*, *A. mollissima* subsp. argentea, *Cymbopogon pospischilii*, *Digitaria argyrograpta*, *D. eriantha* subsp. *eriantha*, *Enneapogon cenchroides*, *E. scoparius*, *Eragrostis rigidior*, *Heteropogon contortus*, *Themeda triandra*.

Herbs: *Barleria macrostegia*, *Dicoma schinzii*, *Harpagophytum procumbens* subsp. *procumbens*, *Helichrysum cerastioides*, *Hermbstaedtia odorata*, *Hibiscus marlothianus*, *Jamesbrittenia aurantiaca*, *Lippia scaberrima*, *Osteospermum muricatum*, *Vahlia capensis* subsp. *vulgaris*.

Succulent Herbs: *Aloe grandidentata*, *Piaranthus decipiens*.

Biographically important taxa (GW = Griqualand West endemic; K = Kalahari endemic)

Low Shrub: *Blepharis marginata* (GW).

Succulent Shrub: *Euphorbia bergii* (GW).

Graminoid: *Panicum kalaharense* (K).

Herbs: *Helichrysum arenicola* (K), *Neuradopsis bechuanensis* (K).

Succulent Herbs: *Lithops aucampiae* subsp. *aucampiae* (GW), *Tridentea marientalensis* subsp. *marientalensis* (K).

Conservation Status

According to Mucina and Rutherford (2006) Kimberley Thornveld is classified as Least Threatened, according to the NBA status listed as LC and Poorly .Protected. Only 2% of this vegetation type is statutorily conserved in Vaalbos National Park ((now de-proclaimed) as well as in Sandveld, Bloemhof Dam and S.A. Lombard Nature Reserves. About 18% is already transformed, mostly by cultivation. Erosion is very low. Kimberley Thornveld is mostly used for cattle farming or game ranching, and overgrazing leads to encroachment of the *Senegalia mellifera* subsp. *detinens* tree (Mucina & Rutherford, 2006).

3.1.2.2 Expected Flora Species

The POSA database indicates that 678 species of indigenous plants are expected to occur within the project area (The full list of species will be provided in the final report). One (1) SCC based on their conservation status could be expected to occur within the project area and are provided in Table 3-2 below.

Table 3-2 Threatened flora species that may occur within the project area

Family	Taxon	Author	IUCN	Ecology
Euphorbiaceae	*Euphorbia flanaganii*	N.E.Br.	VU	Indigenous; Endemic

3.1.3 Faunal Assessment

3.1.3.1 Amphibians

Based on the IUCN Red List Spatial Data and FrogMap, eleven (11) amphibian species are expected to occur within the area (The full list will be provided in the final assessment). No amphibian SCCs are expected to occur within the project area.

3.1.3.2 Reptiles

Based on the IUCN Red List Spatial Data and the ReptileMAP database, fifty-one (51) reptile species are expected to occur within the area (The full list will be provided in the final assessment). No reptile SCCs are expected to occur within the project area.

3.1.3.3 Mammals

The IUCN Red List Spatial Data lists 59 mammal species that could be expected to occur within the area (The full list will be provided in the final assessment). This list excludes large mammal species that are normally restricted to protected areas. Twelve (12) of these expected species are regarded as threatened

(Table 3-3). Of these 12 SCCs, four (4) have a low likelihood of occurrence based on the lack of suitable habitat in the project area.

Table 3-3 Threatened mammal species that are expected to occur within the project area

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
Aonyx capensis	Cape Clawless Otter	NT	NT	Low
Atelerix frontalis	South African Hedgehog	NT	LC	Moderate
Eidolon helvum	African Straw-coloured Fruit Bat	LC	NT	Low
Felis nigripes	Black-footed Cat	VU	VU	High
Hydrictis maculicollis	Spotted-necked Otter	VU	NT	Low
Leptailurus serval	Serval	NT	LC	Moderate
Panthera pardus	Leopard	VU	VU	Low
Parahyaena brunnea	Brown Hyaena	NT	NT	Moderate
Poecilogale albinucha	African Striped Weasel	NT	LC	Moderate
Redunca fulvorufula	Mountain Reedbuck	EN	LC	Low
Rhinolophus clivosus	Geoffrey's Horseshoe Bat	NT	LC	Moderate
Rhinolophus dentii	Dent's Horseshoe Bat	NT	LC	Moderate

Atelerix frontalis (South African Hedgehog) has a tolerance to a degree for habitat modification and occurs in a wide variety of semi-arid and sub-temperate habitats (IUCN, 2017). Based on the Red List of Mammals of South Africa, Lesotho and Swaziland (2016), South African Hedgehog populations are decreasing due to the threats of electrocution, veld fires, road collisions, predation from domestic pets and illegal harvesting. The presence of disturbed but suitable habitats in the project area contributed to a moderate likelihood of occurrence for this species.

Felis nigripes (Black-footed cat) is endemic to the arid regions of southern Africa (IUCN, 2017). This species is naturally rare, has cryptic colouring, is small in size and is nocturnal. These factors have contributed to a lack of information on this species (IUCN, 2017). The highest densities of this species have been recorded in the more arid Karoo region of South Africa (IUCN, 2017). The habitat in the project area is suitable for the species and the likelihood of occurrence is therefore rated as high.

Leptailurus serval (Serval) occurs widely through sub-Saharan Africa, except for tropical rainforest and the Saharan desert (IUCN, 2017). Servals occupy dense, well-watered grassland and reedbeds and are always near water (Apps, 2012). Outside of protected areas in southern Africa, their habitats are destroyed by agriculture and forestry developments (Apps, 2012). The presence of open habitats in the project area as well as wetlands near the project area contributed to a moderate likelihood of occurrence for this species.

Parahyaena brunnea (Brown Hyaena) is endemic to southern Africa (IUCN, 2017). This species occurs in dry areas, generally with annual rainfall less than 100 mm, particularly along the coast, semi-desert, open scrub and open woodland savanna (IUCN, 2017). Human-wildlife conflict is the main threat to Brown Hyaenas outside of protected areas, where they are persecuted or hunted for the traditional medicine trade (IUCN, 2017). Despite this, given its known ability to persist outside of formally protected areas the likelihood of occurrence of this species in the project area is moderate.

Poecilogale albinucha (African Striped Weasel) occurs from southwestern Uganda and Kenya to the Western Cape in South Africa (IUCN, 2017). It lives in moist grassland or open woodland with soils suitable for digging burrows (Apps, 2012). In southern Africa, this species is generally rare and the main threat is habitat destruction, due to tree plantations, crops and overgrazing (Apps, 2012). African Striped Weasels are also being heavily exploited so that their body parts can be used in traditional charms and magic (Apps,

2012). The presence of open habitat in the project area contributed to a moderate likelihood of occurrence for this species.

Rhinolophus clivosus (Geoffrey's Horseshoe Bat) has a widespread distribution in North, East and southern Africa as well as parts of southwest Asia (IUCN, 2017). In southern Africa it occupies a wide range of habitats and roosts in caves, mines and rock cavities (Apps, 2012). Human disturbance poses a possible threat to large roosts in caves, as well as indirect poisoning due to pesticides, insecticides and other chemicals (Apps, 2012; IUCN, 2017). The tendency of this species to occupy a variety of habitats contributed to a moderate likelihood of occurrence for this species in the project area.

Rhinolophus dentii (Dent's Horseshoe Bat) has a wide but patchy distribution in West and southern Africa (IUCN, 2017). It mostly occupies savanna habitats and drier areas (but not desert) and is dependent on suitable roosting habitats such as caves, rock crevices, thatched roofs, abandoned mines and hollow trees (Apps, 2012; IUCN, 2017). Large roosts in caves may be locally threatened by human disturbance (Apps, 2012: IUCN, 2017). The presence of savanna habitats in the project area contributed to a moderate likelihood of occurrence for this species.

3.2 Field Assessment

The following sections provide the results from the field survey for the proposed development that was undertaken during the 4th to the 7th of August 2022.

3.2.1 Flora Assessment

This section is divided into two sections:

- Indigenous flora; and
- Invasive Alien Plants (IAPs).

3.2.1.1 Indigenous Flora

The species composition of the assessment area was consistent with typical Kimberley Thornveld vegetation type. This is attributed to the limited transformation and disturbance to the area, due to the land use mainly being grazed land for livestock. Distinctive vegetation communities were observed within this vegetation type and can be classified into woody Thornveld, grassy Thornveld and artificial wetlands. Overall, the difference within the Thornveld habitat is mainly the presence (woody) or absence (grassy) of woody (trees) plants. The plant species recorded is by no means comprehensive, and repeated surveys during different phenological periods not covered, may likely yield up to 20% additional flora species for the project area. However, floristic analysis conducted to date is however regarded as a sound representation of the local flora for the project area. Pictures of some plants recorded can be seen in Figure 3-11.

The woody Thornveld floral community was typically dominated by one main woody species, *Vachellia karoo* (Camelthorn), but also had *V. tortilis, V. hebeclada, Ziziphus mucronata, Searsia Lancea, Senegalia mellifera, Ehretia rigida* and *Tarchonanthus camphoratus.*

The herbaceous layer and grasses were similar in each community with species such as*, Eragrostis lehmanniana, Aristida canescens, A. congesta, A. mollissima subsp. argentea, Digitaria argyrograpta, D. eriantha subsp. eriantha, Enneapogon cenchroides, E. scoparius, Eragrostis rigidior, Heteropogon contortus, Themeda triandra, Gazania krebsiana, Boophone disticha, Lycium pilifolium, Melolobium microphyllum, Dicoma schinzii, Harpagophytum procumbens, Gnidia polycephala*

Artificial wetlands included species such as *Typha capensis*.

3.2.1.1.1 Floral Species of Concern

During the field assessment 1 species of protected tree was observed: *Vachellia erioloba* (Camelthorn). The protected trees observed are protected by the List of Protected Tree Species under the National Forests Act, 1998 (Act No. 84 of 1998) (NFA). In terms of the NFA, no person may cut, disturb, damage or

destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate, or in any other manner acquire or dispose of any protected tree or any product derived from a protected tree, except under a licence or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated. Contravention of this declaration is regarded as a first category offence. Several Camelthorn trees occurred naturally spaced throughout the area, mainly located within the woody Thornveld. A heat map showing the Camelthorn density is shown in Figure 3-10.

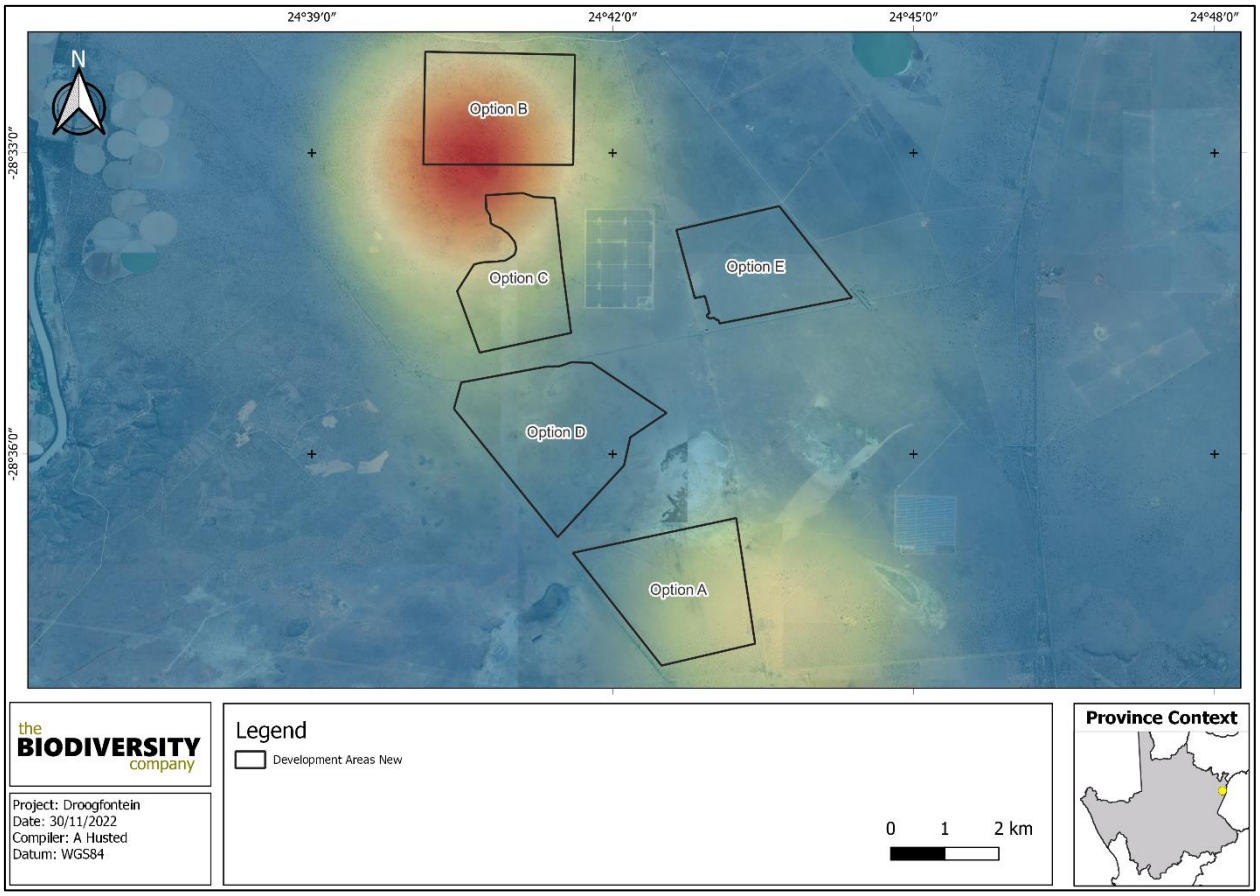


Figure 3-10 Heatmap indicating Camelthorn presence and density, from Red to Blue. Red=High number, Blue=None.

Figure 3-11 Photographs illustrating some of the flora recorded within the assessment area: A) Boophone disticha, B) Tarchonanthus camphoratus, C) Gnidia polycephala, D) Vachellia erioloba (Nationally Protected).

3.2.1.2 Invasive Alien Plants

Invasive Alien Plants (IAPs) tend to dominate or replace indigenous flora, thereby transforming the structure, composition and functioning of ecosystems. Therefore, it is important that these plants are controlled by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species.

NEMBA is the most recent legislation pertaining to alien invasive plant species. In August 2014, the list of Alien Invasive Species was published in terms of the NEMBA. The Alien and Invasive Species Regulations were published in the Government Gazette No. 44182, 24th of February 2021. The legislation calls for the removal and / or control of IAP species (Category 1 species). In addition, unless authorised thereto in terms of the NWA, no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse. Below is a brief explanation of the three categories in terms of the NEMBA:

- *Category 1a*: Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
- *Category 1b*: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.
- *Category 2*: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.
- *Category 3*: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

Note that according to the Alien and Invasive Species Regulations, a person who has under his or her control a category 1b listed invasive species must immediately:

- Notify the competent authority in writing
- Take steps to manage the listed invasive species in compliance with:
    - Section 75 of the NEMBA;
    - The relevant invasive species management programme developed in terms of regulation 4; and
    - Any directive issued in terms of section 73(3) of the NEMBA.

Two species, namely *Opuntia ficus indica* and *Opuntia stricta* were recorded within the project area. Any species are listed under the Alien and Invasive Species List 2020, Government Gazette No. GN1003 as Category 1b. Category 1b species must be controlled by implementing an IAP Management Programme, in compliance of section 75 of the NEMBA, as stated above.

3.2.2 Faunal Assessment

Herpetofauna and mammal observations and recordings are discussed in the information below.

3.2.2.1 Amphibians and Reptiles

No species of amphibian were recorded in the project area during survey period. However, there is the possibility of more species being present, as certain species are secretive and require long-term surveys to ensure capture. Two (2) (Table 3-4) reptile species was recorded during the survey period, this was largely due to the season in which the field survey was carried out as well as the fact that no pitfall trapping was done, surveys relied on opportunistic sightings as opposed to intensive and appropriate sampling methods. The only other method utilised was refuge examinations using visual scanning of terrains to record smaller herpetofauna species that often conceal themselves under rocks, in fallen logs, rotten tree stumps, in leaf litter, rodent burrows, ponds, old termite mounds, this method was also not intensively applied in the field.

Table 3-4 Summary of herpetofauna species recorded within the project area.

Species	Common Name	Conservation Status		NC Nature Conservation Act No. 9 Of 2009
		Regional (SANBI, 2016)	IUCN (2022)	
Naja nivea	Cape Cobra	LC	LC	-
Stigmochelys pardalis	Leopard Tortoise	LC	LC	-

3.2.2.2 Mammals

Nine (9) mammal species were observed during the survey of the project area (Table 3-5) based on either direct observation or the presence of visual tracks and signs (Figure 3-12). None of the species recorded are regarded as SCCs form an international or national perspective but all are protected provincially.

Personal communication with the Landowner confirmed the presence of Black-footed Cat (*Felis nigripes*), however no direct observations were made during diurnal and nocturnal surveys. The presence of this SCC should be confirmed.

Table 3-5 Summary of mammal species recorded within the project area

Species	Common Name	Conservation Status		NC Nature Conservation Act No. 9 Of 2009
		Regional (SANBI, 2016)	IUCN (2022)	
Canis mesomelas	Black-backed Jackal	LC	LC	Schedule 4
Cryptomys hottentotus	Southern African Mole-rat	LC	LC	Schedule 2
Hystrix africaeaustralis	Cape Porcupine	LC	LC	Schedule 2
Lepus saxatilis	Scrub Hare	LC	LC	Schedule 2
Orycteropus afer	Aardvark	LC	LC	Schedule 1
Pedetes capensis	Springhare	LC	LC	Schedule 2
Raphicerus campestris	Steenbok	LC	LC	Schedule 2
Sylvicapra grimmia	Common Duiker	LC	LC	Schedule 2
Xerus inauris	South African Ground Squirrel	LC	LC	Schedule 2

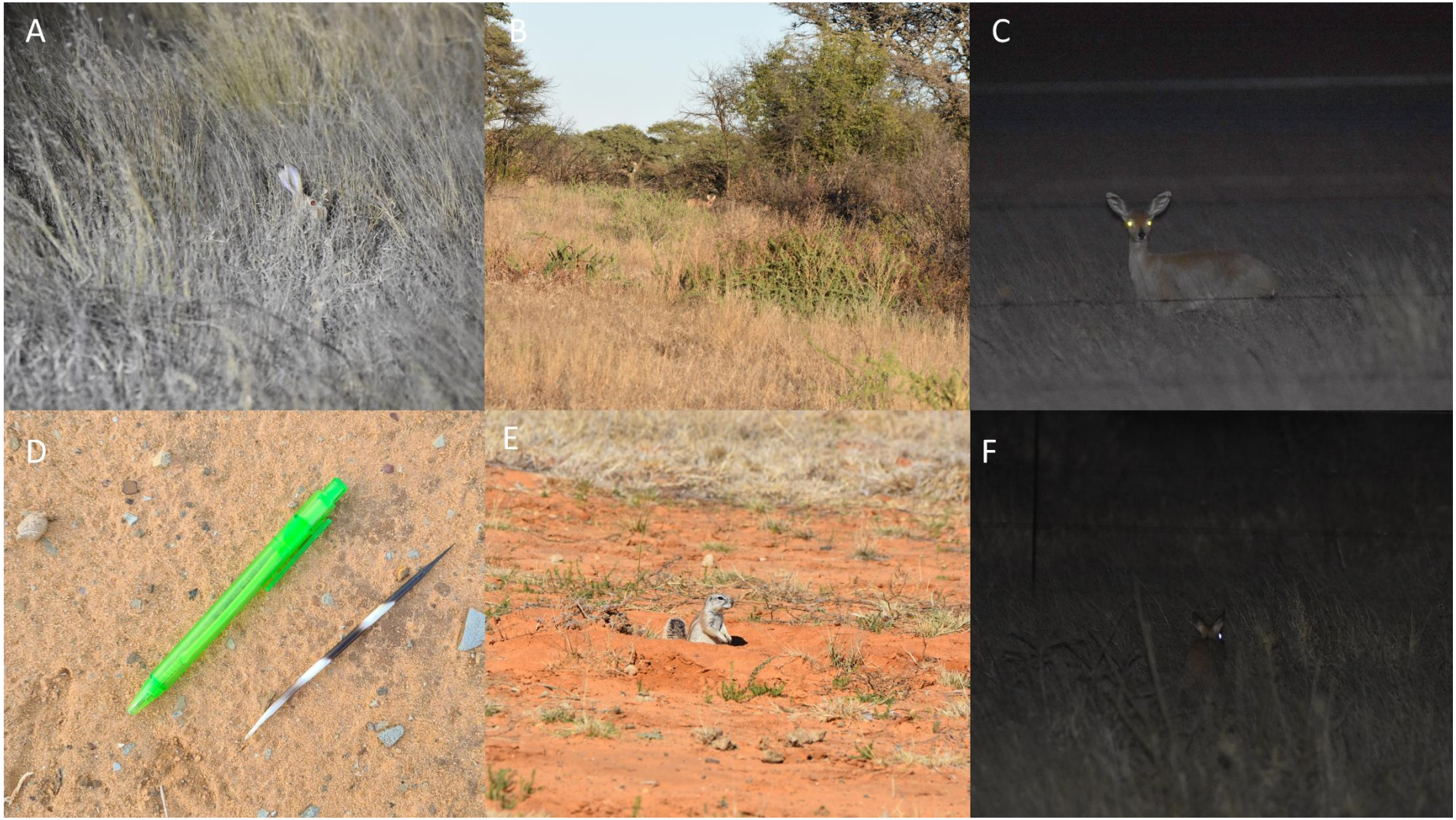


Figure 3-12 ***Some of the mammal species recorded during the field assessment: A) Scrub Hare (Lepus saxatilis, B) Common Duiker (Sylvicapra grimmia), C) Steenbok (Raphicerus campestris) , D) Cape Porcupine (Hystrix africaeaustralis), E) South African Ground Squirrel (Xerus inauris) and F) Springhare (Pedetes capensis)***

3.2.3 Habitat Assessment and Site Ecological Importance

3.2.3.1 Habitat Assessment

The main habitat types identified across the project area were initially identified largely based on aerial imagery. These main habitat types were refined based on the field coverage and data collected during the survey; the delineated habitats can be seen in Figure 3-13. Emphasis was placed on limiting timed meander searches along the proposed project area within the natural habitats and therefore habitats with a higher potential of hosting SCC. The habitats observed, coincide with the vegetation types as described by Mucina & Rutherford in 2006 and SANBI (2019) due to the lack of large-scale transformation, these are discussed in detail in the sections that follow. A summary of habitat types delineated within the project area can be seen in Table 3-6

Table 3-6 Summary of habitat types delineated within the project area

Habitat Type	Description	Ecosystem Processes and Services	Habitat Sensitivity
Thornveld (Woody)	Terrain consists of a low to zero slope with deep soils. Variable in the presence or absence of Woody species and shrub density. Semi-natural, but slightly disturbed due to the grazing by livestock and also human infringement.	Provides crucial ecological services to the area/region, including runoff and erosion control enabling rainwater percolation, nutrient cycling within the topsoil layers supporting the healthy functioning of indigenous flora and re-seeding processes, carbon sequestration, and foraging and nesting resources for livestock and local indigenous fauna species. Aids in the filtration of water permeating through the soil into the drainage lines. Important corridor for fauna dispersion within the landscape. The unit acts as a greenland which supports viable plant species populations and is also used for foraging by fauna. Woody species assists in nitrogen fixation.	High
Water Resources	Low to no slope with alluvial soils. Depressions where surface water collects.	Water Points, functions as important Water resources. Provides refuge and grazing areas, especially during the dry seasons Provides surface water within the landscape.	High
Koppie	Moderately steep slopes with shallow soils. Distinct and unique habitat features within area.	Capture and filter precipitation and run-off. Provides unique habitat for numerous species. Provides greater heterogeneity in regional habitat and microclimate.	High
Thornveld (Grassy)	Terrain consists of a low to zero slope with deep soils. Variable in the presence or absence of grass species and shrub density. Semi-natural, but slightly disturbed due to the grazing by livestock and also human infringement.	Provides grazing and foraging resources for indigenous fauna and livestock. Aids in the filtration of water permeating through the soil into the drainage lines. Important corridor for fauna dispersion within the landscape. Acts as buffer for high sensitivity areas. The unit acts as a greenland which supports viable plant species populations and is also used for foraging by fauna.	Medium
Artificial wetlands	An artificial system formed through a leaking pipe through which channels through, which surface water naturally collates and flows.	Water Paths, functions as important water resources. Provides surface water within the landscape.	Medium

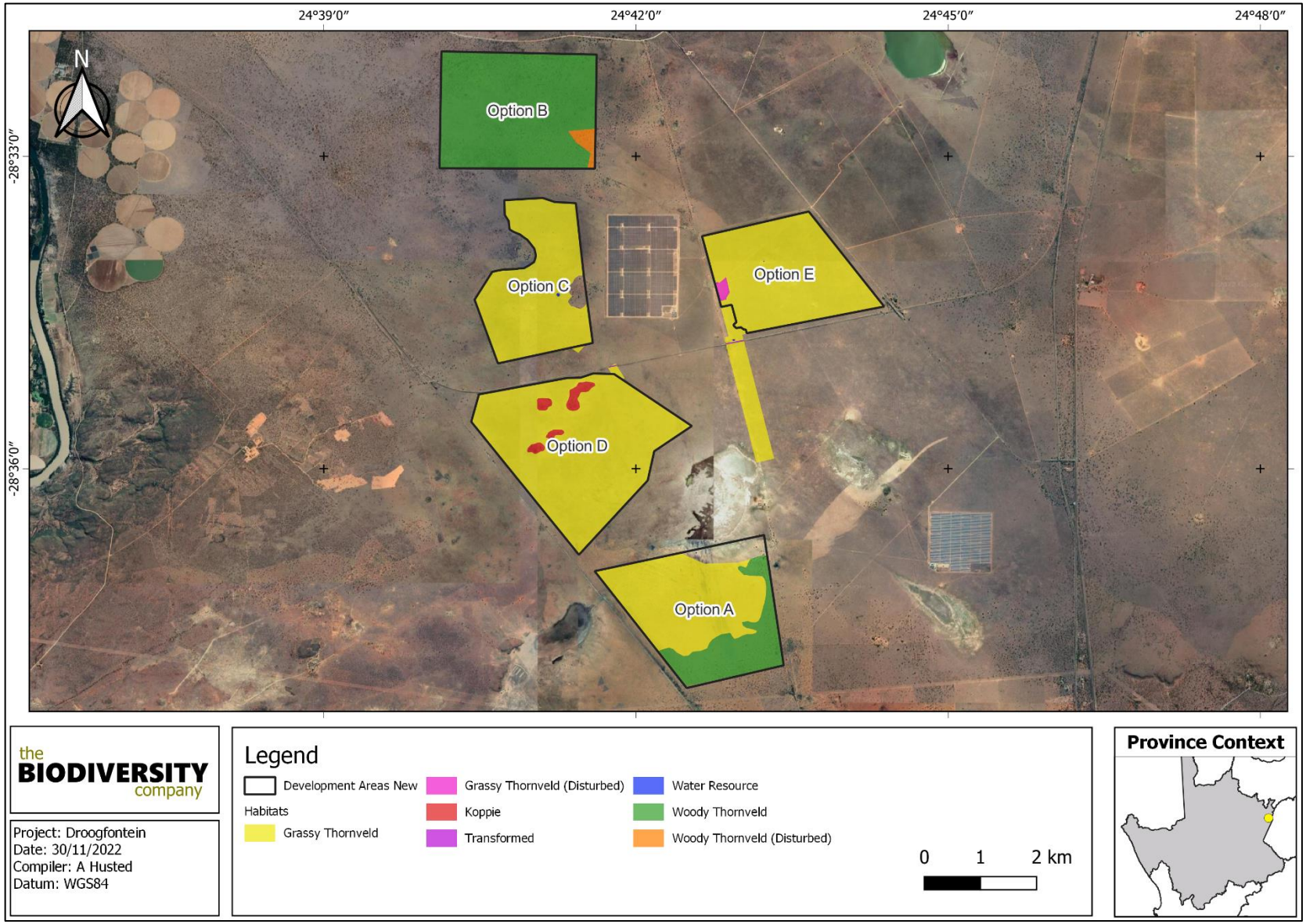


Figure 3-13 Habitats identified in the project area.

3.2.3.1.1 Woody Thornveld

This habitat is Thornveld with a distinct woody component comprising of large trees. The habitat has not been disturbed by much, except for the historic and current grazing (Figure 3-14 and Figure 3-15). This habitat type is regarded as semi-natural, but slightly disturbed due to the grazing by livestock, mismanagement and also human infringement.

The current ecological condition of this habitat with regard to the main driving forces, are intact, which is evident in the amount of, and importance of the species recorded in the flora and faunal assessment, and also to the type of plant species recorded corresponding to the vegetation type as described by Mucina (2006). Even though this habitat is partly disturbed, it supports largely intact vegetation, including a high density of Camelthorn (*Vachellia erioloba*) which is protected Nationally. This habitat type acts as a viable greenland used for foraging and reproduction, corridor for fauna dispersion within the landscape. Its current state may be regarded as ESA.

Option A contained a small portion of this habitat, whereas the entire Option B comprised of this habitat.

Figure 3-14 Woody Thornveld from Option A

Figure 3-15 Woody Thornveld from Option B

3.2.3.1.2 Koppie

This habitat includes areas that are stony and rocky ridges/hills with a slope different from the surrounding areas, bedrock protruding from the soil layer and only occurred in Option D (Figure 3-16and Figure 3-17). The habitat is used by faunal species as fine-scale habitats and is important for several lifestages. These habitats can be considered as ecological hotspots being an important habitat for fauna and flora, especially plants as well as reptiles. The habitat has been infringed upon by livestock, which has had an impact on this habitat, although minor. This habitat forms part of a unique landscape within the region and provides refugia, food and a more natural environment.

Figure 3-16 Koppie habitat from Option D

Figure 3-17 Koppie habitat from Option D

3.2.3.1.3 Grassy Thornveld

This habitat is Thornveld without a distinct woody component, and has not been disturbed by much, except for the historic and current grazing (Figure 3-21 and Figure 3-19). The habitat has the same ecological condition as the woody Thornveld, and acts as a greenland which supports viable plant species populations and is also used for foraging by fauna.

This habitat occupied the largest portion of Option A, C, D, and E and is considered a viable area for development, due to the lack of woody plant species.

Figure 3-18 Grassy Thornveld

Figure 3-19 Grassy Thornveld

3.2.3.1.4 Water Resources and Artificial Wetlands

Water resources are classed as wetlands and are identified in the wetland report. These mainly occur in the form of depressions and even though somewhat disturbed, the ecological integrity, importance and functioning of these areas play a crucial role as a water resource system (Figure 3-20). The preservation of this system is the most important aspect to consider for the proposed development. A high density of the provincially protected *Ammocharis coranica.*

The artificial wetland habitat exists due to leaking bulk water pipelines between Kimberly and Riverton(Figure 3-21 and Figure 3-22).

These habitats are further discussed within the Wetland Report.

Figure 3-20 Depression from the PAOI

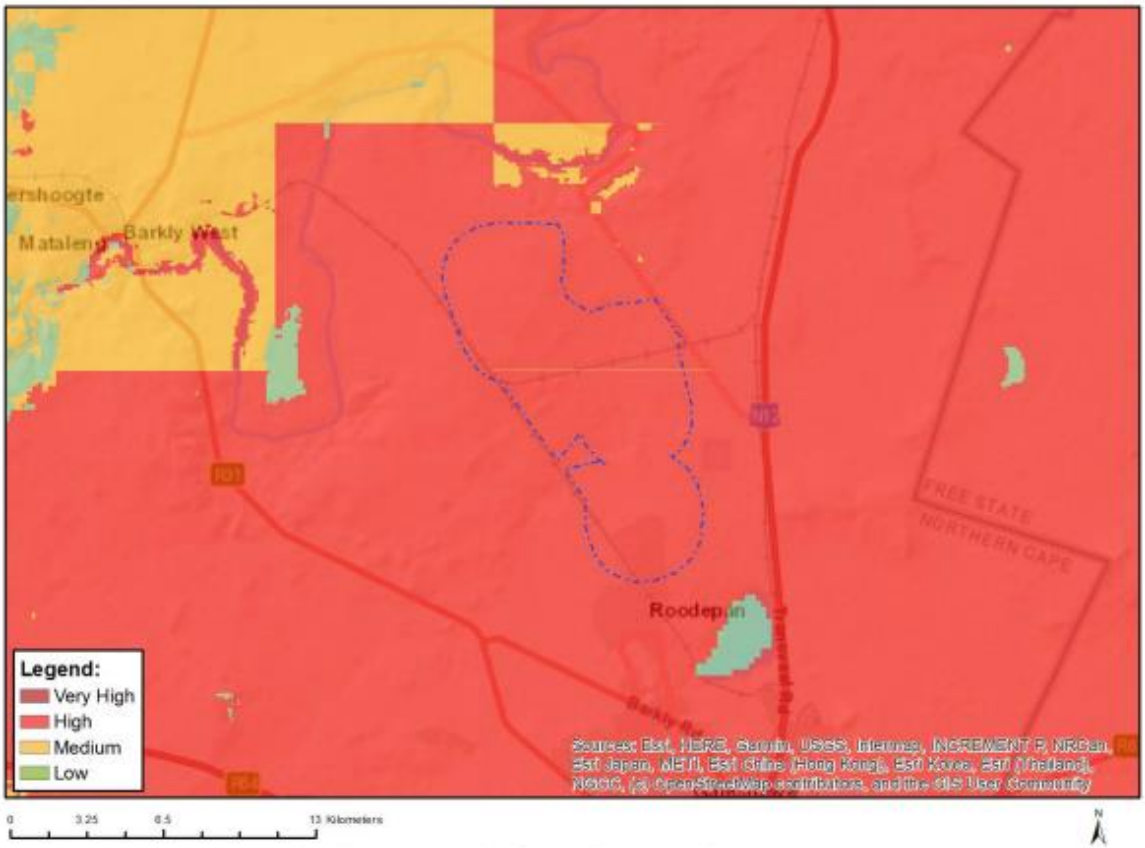
Figure 3-21 One of the sources of the water

Figure 3-22 Artificial wetland within the project area

3.2.4 Site Ecological Importance

The animal species theme sensitivity is High (Figure 3-23) and this is attributed to the associated avifaunal species. The plant species theme sensitivity for the development area is predominantly classified as Medium sensitivity (Figure 3-24). The biodiversity theme sensitivity, as indicated in the screening report (Figure 3-25) was derived to be predominantly Low for the development, with the exception of a Very High portion proximal to Option A, (Figure 3-25).

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Neotis ludwigii
High	Aves-Sagittarius serpentarius
High	Aves-Gyps africanus
Medium	Aves-Sagittarius serpentarius
Medium	Aves-Gyps africanus
Medium	Aves-Neotis ludwigii

Figure 3-23 Animal Species Theme Sensitivity for the development area, National Web based Environmental Screening Tool.

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY

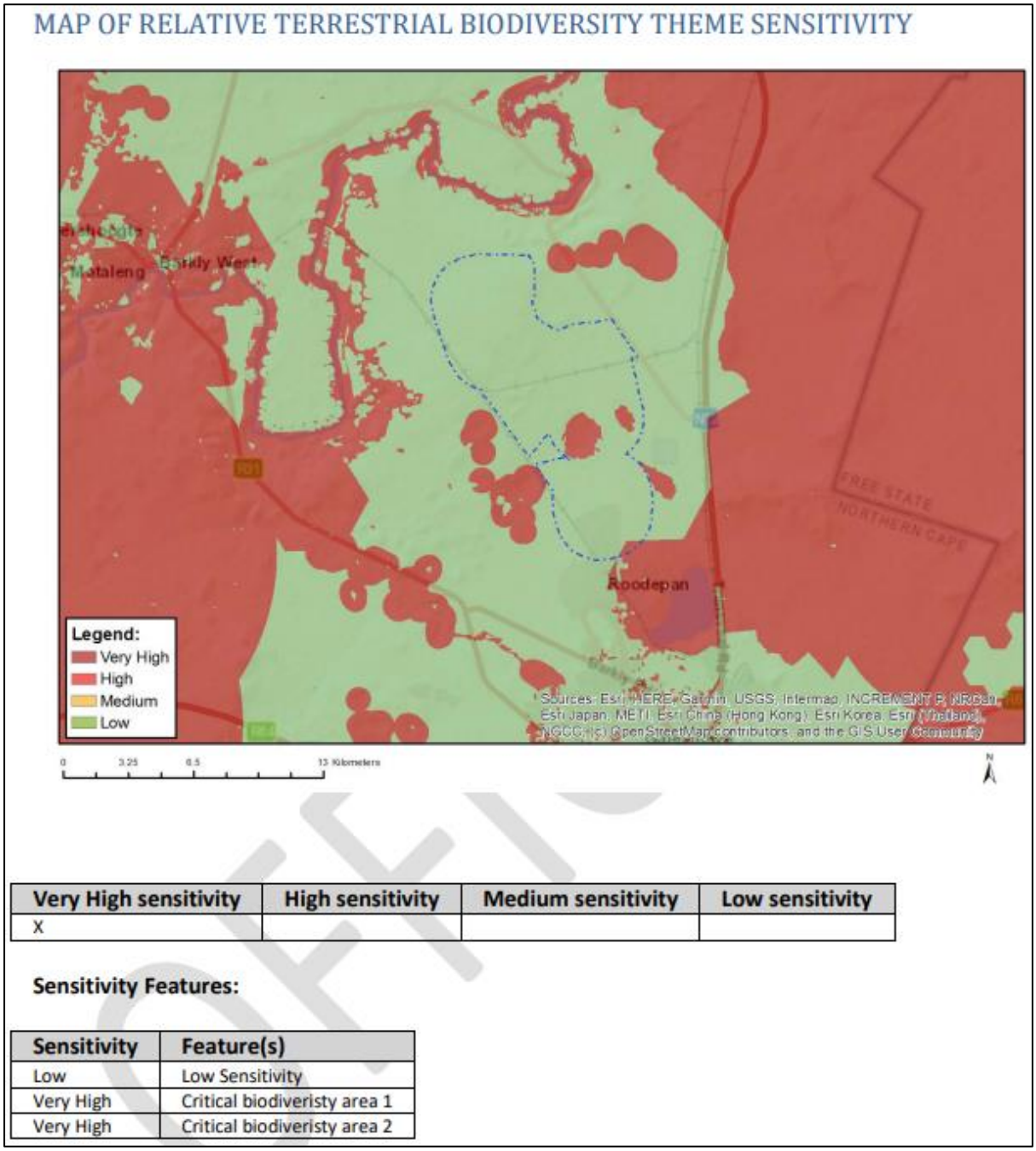
Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Medium	Sensitive species 257

Figure 3-24 Plant Species Theme Sensitivity for the development area, National Web based Environmental Screening Tool.



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Very High	Critical biodiveristy area 1
Very High	Critical biodiveristy area 2

Figure 3-25 Terrestrial Biodiversity Theme Sensitivity for Option B, National Web based Environmental Screening Tool.

The completion of the terrestrial biodiversity assessment found that the Woody Thornveld habitats which overlap with the screening report is of High sensitivity and thus disputes the screening report in that regard. The location and extent of these habitats are illustrated in Figure 3-13. Based on the criteria provided in Section 2.3 of this report, all habitats within the assessment area of the proposed project were allocated a sensitivity category (Table 3-7). The sensitivities of the habitat types delineated are illustrated in Figure 3-26.

Table 3-7 SEI Summary of habitat types delineated within field assessment area of project area

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
Woody Thornveld, Water Resources & Koppie	Medium > 50% of receptor contains natural habitat with potential to support SCC	Medium Medium semi-intact area for any conservation status of ecosystem type Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	Medium	Low Woody Species	High
Grassy Thornveld	Medium > 50% of receptor contains natural habitat with potential to support SCC	Medium Medium semi-intact area for any conservation status of ecosystem type Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	Medium	Medium	Medium
Artificial Wetlands	Low	Medium	Low	Medium	Low

Table 3-8 Guidelines for interpreting Site Ecological Importance in the context of the proposed development activities

Site Ecological Importance	Interpretation in relation to proposed development activities
High	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Low	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.

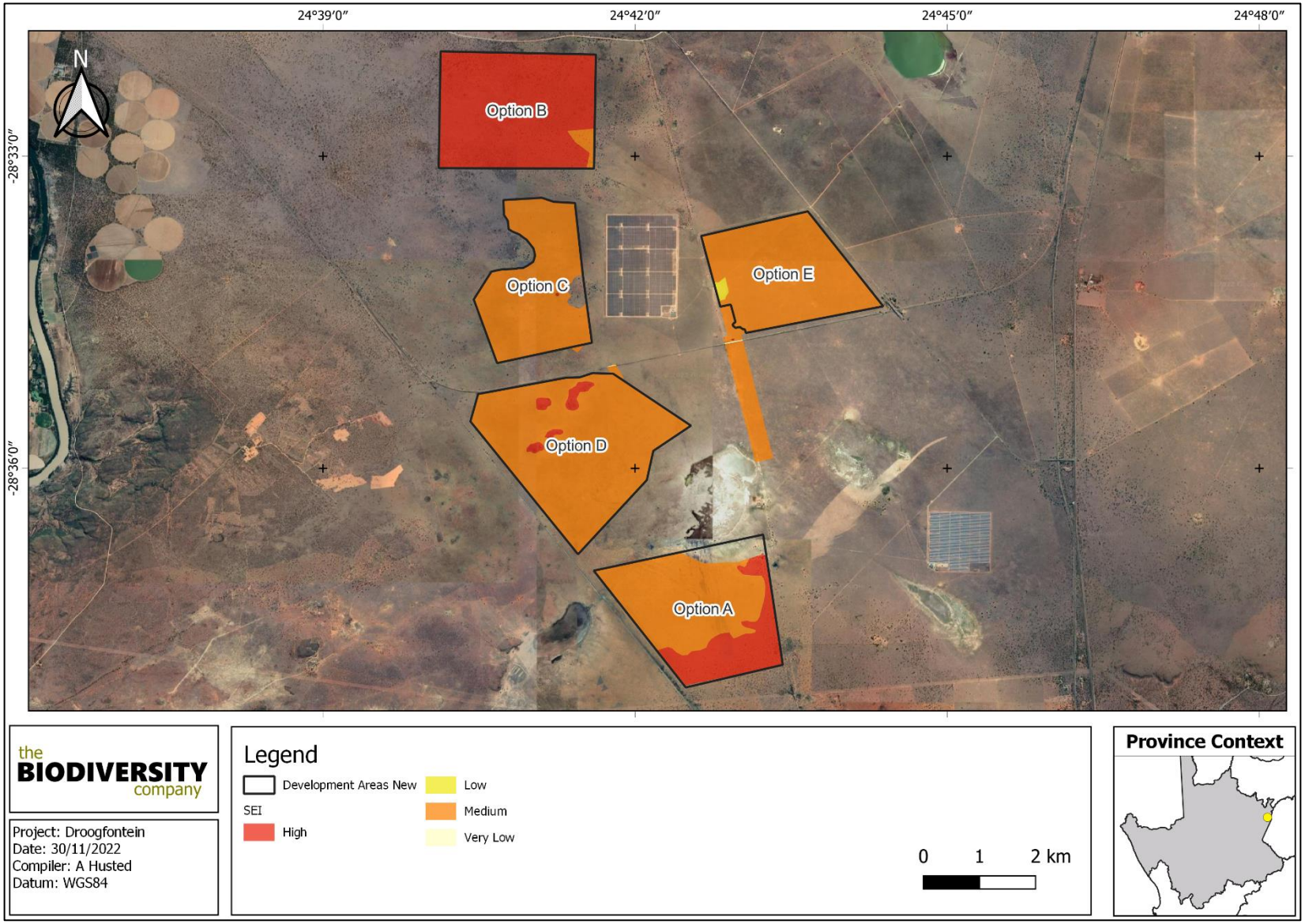


Figure 3-26 Sensitivity of the project area

4 Impact Assessment and Management Plan

The sections below serve to outline and summarise the types of perceived impacts from the proposed activities on the terrestrial biodiversity and ecology of the Project Area. The associated significance of each impact is evaluated as relevant to the local biodiversity and the likely project activities.

4.1 Biodiversity Risk Assessment

4.1.1 Impact Assessment Considerations and Procedure

The project activities will have a negative effect on the natural environment of the area. Anthropogenic activities drive habitat destruction leading to the displacement of fauna and flora and possibly causing direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, nesting sites and wildlife movement corridors such as rivers, streams and drainage lines, or other locally important features. The removal of natural vegetation is likely to reduce the habitat available for all types of fauna species and hence reduce animal populations and species compositions within the area.

Potential impacts were evaluated against the data captured during the desktop assessment and field survey to identify associated relevance to the habitats within the area. The relevant impacts associated with the proposed activities were then subjected to a prescribed impact assessment methodology as provided by the client, which is available on request. The planning, decommissioning and/or rehabilitation phases were not considered based on the nature of the likely activities and the associated negatable impacts expected during these phases. Present Impacts to Biodiversity

Considering the anthropogenic activities and influences within the landscape, several negative impacts to biodiversity were observed within the project area (Figure 4-1). These include;

- Farm roads and main roads (and associated traffic and wildlife road mortalities);
- Grazing and trampling of natural vegetation by livestock;
- Invasive species; and
- Fences and associated maintenance.

Figure 4-1 Negative impacts identified across the project area: A) Trampling by livestock, B) Wood harvesting, C) Livestock and Fences. and D) Secondary Road

4.1.2 Anticipated Impacts

The impacts anticipated for the proposed activities are considered in order to predict and quantify these impacts and assess & evaluate the magnitude on the identified terrestrial biodiversity (Table 4-1).

Table 4-1 Anticipated impacts for the proposed activities on terrestrial biodiversity

Main Impact	Project activities that are likely to cause the impact	Secondary impacts anticipated
Destruction, fragmentation and degradation of habitats and ecosystems	Physical removal of vegetation, including protected species	Displacement/loss of flora & fauna (including possible SCC)
	Access roads and servitudes	Increased potential for soil erosion
	Soil dust precipitation	Habitat fragmentation
	Dumping of waste products	Increased potential for the establishment of IAP vegetation
	Random events such as fire (cooking fires or cigarettes)	Erosion
Spread and/or establishment of Invasive Alien Plants	Vegetation removal	Habitat loss for native flora & fauna (including SCC)
	Vehicles and people spreading seed	Spreading of potentially dangerous diseases due to invasive and pest species
	Unsanitary conditions surrounding infrastructure, promoting the establishment of alien and/or invasive rodents	Alteration of fauna assemblages due to habitat modification
	Creation of infrastructure suitable for breeding activities of alien and/or invasive birds	Displacement of indigenous bird species
Direct mortality of fauna	Clearing of vegetation and the mass dumping of earth waste	Loss of habitat
		Loss of ecosystem services
	Roadkill due to vehicle collision	Increase in rodent populations and associated disease risk. Deterioration of local ecology
	Pollution of water resources due to dust effects, chemical spills, etc.	
	Intentional killing of fauna for food or sale	
Reduced dispersal/migration of fauna	Loss of landscape used as corridor	Reduced dispersal/migration of fauna
		Loss of ecosystem services
	Compacted roads	Reduced plant seed dispersal
	Removal of vegetation	
Environmental pollution due to water runoff, spills from vehicles and erosion	Chemical (organic/inorganic) spills	Pollution in watercourses and the surrounding environment
	Erosion	Faunal mortality (direct and indirect)
		Groundwater pollution
		Loss of ecosystem services
Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, dust, and light pollution	Operation of machinery (Large earth moving machinery, vehicles)	Disruption/alteration of ecological life cycles due to noise
		Loss of ecosystem services
	Vehicles	Loss of ecosystem services
Staff and others interacting directly with fauna (potentially dangerous) or the poaching of animals	All unregulated/supervised activities outdoors	Loss of SCCs

4.1.3 Unplanned Events

The planned activities will have anticipated impacts as discussed; however, unplanned events may occur on any project and may have potential impacts which will need management.

Table 4-2 is a summary of the findings of an unplanned event assessment from a terrestrial ecology perspective. Note, not all potential unplanned events may be captured herein, and this must therefore be managed throughout all phases according to recorded events.

Table 4-2 Summary of unplanned events for terrestrial biodiversity

Unplanned Event	Potential Impact	Mitigation
Spills into the surrounding environment	Contamination of habitat as well as water resources associated with a spillage.	A spill response kit must be available at all times. The incident must be reported on and if necessary, a biodiversity specialist must investigate the extent of the impact and provide rehabilitation recommendations.
Fire	Uncontrolled/unmanaged fire that spreads to the surrounding natural areas.	Appropriate/Adequate fire management plan need to be implemented.
Erosion caused by water runoff from the surface	Erosion on the side of the road	Storm water management plan must be compiled and implemented.

4.1.4 Loss of Irreplaceable Resources

The proposed activities linked to the OHL and associated structures are likely to be of a low impact and relatively small footprint, however it is the creation of a construction/maintenance road that is expected to have a more considerable impact. Careful placement of certain footprints/roads is therefore important so as to minimise the damage to natural resources.

The proposed activities will be conducted over the several habitats. These areas encompass indigenous vegetation that may be considered largely functional in nature and as such any irresponsible and/or medium to high impact activities may result in the loss of the following resources:

- Nationally Protected trees;
- SCC fauna species (through direct mortality during clearing and construction activities);
- Foraging and traversing routes, and/or nesting sites, relevant to the wide diversity of fauna that frequent the areas; and
- As the area is in a largely functional state, the loss of these resources would be considered significant. Therefore, mitigations must be put in place and implemented to prevent the total destruction of any valuable natural resources.

4.1.5 Alternatives

Five alternative options were provided. Option C and Option E are the preferred option as it will result in less loss of high sensitivity area.

4.1.6 No-Go Scenario

The current land use is livestock grazing and the associated impacts caused by this, to the terrestrial ecology could amount to be medium to high intensity if poorly managed. If the land use is well managed, then the long-term impacts to the local ecology will continue to be low - this will require that grazing areas are rotated, grazing capacities are sustained, and stocking densities are controlled. Under the current circumstances, the 'no-go' alternative is considered to represent a low-medium long-term negative impact on the environment. However, it is noted that if the current land uses are left unmanaged for the foreseeable future, it is probable that the ecological integrity and functioning of the grassland area will deteriorate.

4.1.7 Identification of Additional Potential Impacts

4.1.7.1 Construction Phase

The following potential main impacts on the biodiversity, were considered for the construction phase of the proposed development, for **Option C and E, as they are the preferred options**. This phase refers

to the period during construction when the proposed features are constructed; and is considered to have the largest direct impact on biodiversity. The main anticipated impact includes the clearing of vegetation, proliferation of alien plant species along the roads and cleared areas as well as the severing of movement corridors for fauna, and the fragmentation of habitat. The following potential impacts to terrestrial biodiversity were considered:

- Destruction, further loss and fragmentation of the of habitats, ecosystems and vegetation community, including protected tree species;
- Introduction of alien species, especially plants;
- Displacement of the indigenous faunal community (including SCC) due to habitat loss, direct mortalities, and disturbance (road collisions, noise, dust, light, vibration, and poaching).

All likely impacts are rated as Medium-High negative significance pre-mitigation but may be reduced to Low-Medium significance through the proper implementation of effective mitigation measures. The most important mitigation measures for this phase are as follows:

- Ensure that the site footprint is as small as possible and responsibly positioned, the development area must be properly fenced off during construction
- Protected plants must be avoided or destruction permits obtained;
- Land clearing must be done over at least three days and conducted linearly and successively from the north to the south; and
- No trapping, killing, or poisoning of any wildlife is to be allowed and signs must be put up to enforce this. Monitoring must take place in this regard.

4.1.7.2 Operational Phase

The operational phase of the impact of daily activities, for **Option C and E,** is anticipated to further spread the IAP, as well as the deterioration of the habitats due to the increase of dust and edge effect impacts. Dust reduces the ability of plants to photosynthesize and thus leads to degradation/retrogression of the veld. Moving maintenance vehicles do not only cause sensory disturbances to fauna, affecting their life cycles and movement, but will lead to direct mortalities due to collisions.

The following potential impacts were considered:

- Continued fragmentation and degradation of natural habitats and ecosystems;
- Continuing spread of IAP and weed species; and
- Ongoing displacement and direct mortalities of the faunal community (including SCC) due to continued disturbance (road collisions, noise, light, dust, vibration, poaching, etc.).

All potential impacts may be reduced from a significance rating of High to Low with the proper implementation of ongoing mitigation measures. The most important mitigation measures to implement during this phase include:

- The continual usage of the same roadways, parking areas and walkways, and the following of speed limits;
- The responsible management of all waste; and
- An IAP management and habitat rehabilitation plan must be implemented and updated annually.

Table 4-3 Assessment of significance of impacts on the terrestrial fauna and flora associated with the construction phase, pre-mitigation.

Impact	Pre Mitigation							
	Extent	Probability	Duration	Reversibility	Irreplaceability	Cumulative Effect	Magnitude/ Intensity	**Significance**
Destruction, loss and fragmentation of habitats, ecosystems and the vegetation community.	2	4	4	3	3	3	2	
	Local/district: Will affect the local area or district.	Definite: Impact will certainly occur (Greater than a 75% chance of occurrence).	Permanent: The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.	Barely reversible: The impact is unlikely to be reversed even with intense mitigation measures.	Significant loss of resources: The impact will result in significant loss of resources.	Medium cumulative impact: The impact would result in minor cumulative effects.	Medium: Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).	**Negative Medium Impact**
Introduction of IAP species and invasive fauna.	2	3	3	2	2	3	2	
	Local/district: Will affect the local area or district.	Probable: The impact will likely occur (Between a 50% to 75% chance of occurrence).	Long term: The impact and its effects will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).	Partly reversible: The impact is partly reversible but more intense mitigation measures are required.	Marginal loss of resource: The impact will result in marginal loss of resources.	Medium cumulative impact: The impact would result in minor cumulative effects.	Medium: Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).	**Negative Medium Impact**
Displacement of the indigenous faunal community (including SCC) due to habitat loss, direct mortalities, and disturbance (road collisions, noise, dust, light, vibration, and poaching).	2	4	3	2	2	3	2	
	Local/district: Will affect the local area or district.	Definite: Impact will certainly occur (Greater than a 75% chance of occurrence).	Long term: The impact and its effects will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).	Partly reversible: The impact is partly reversible but more intense mitigation measures are required.	Marginal loss of resource: The impact will result in marginal loss of resources.	Medium cumulative impact: The impact would result in minor cumulative effects.	Medium: Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).	**Negative Medium Impact**

Table 4-4 Assessment of significance of impacts on the terrestrial fauna and flora associated with the construction phase, post-mitigation.

Impact	Post Mitigation							
	Extent	Probability	Duration	Reversibility	Irreplaceability	Cumulative Effect	Magnitude/ Intensity	**Significance**
Destruction, loss and fragmentation of habitats, ecosystems and the vegetation community.	1	3	2	2	2	2	2	
	Site: The impact will only affect the site.	Probable: The impact will likely occur (Between a 50% to 75% chance of occurrence).	Medium term: The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).	Partly reversible: The impact is partly reversible but more intense mitigation measures are required.	Marginal loss of resource: The impact will result in marginal loss of resources.	Low cumulative impact: The impact would result in insignificant cumulative effects.	Medium: Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).	**Negative Low Impact**
Introduction of IAP species and invasive fauna.	1	2	2	2	2	1	2	
	Site: The impact will only affect the site.	Possible: The impact may occur (Between a 25% to 50% chance of occurrence).	Medium term: The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).	Partly reversible: The impact is partly reversible but more intense mitigation measures are required.	Marginal loss of resource: The impact will result in marginal loss of resources.	Negligible cumulative impact: The impact would result in negligible to no cumulative effects.	Medium: Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).	**Negative Low Impact**
Displacement of the indigenous faunal community (including SCC) due to habitat loss, direct mortalities, and disturbance (road collisions, noise, dust, light, vibration, and poaching).	2	3	2	2	2	2	2	
	Local/district: Will affect the local area or district.	Probable: The impact will likely occur (Between a 50% to 75% chance of occurrence).	Medium term: The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).	Partly reversible: The impact is partly reversible but more intense mitigation measures are required.	Marginal loss of resource: The impact will result in marginal loss of resources.	Low cumulative impact: The impact would result in insignificant cumulative effects.	Medium: Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).	**Negative Low Impact**

Table 4-5 Assessment of significance of potential impacts on terrestrial fauna and flora associated with the operational phase, pre-mitigation

Impact	Pre Mitigation							
	Extent	Probability	Duration	Reversibility	Irreplaceability	Cumulative Effect	Magnitude/ Intensity	**Significance**
Continued fragmentation and degradation of natural habitats and ecosystems.	2	3	3	3	3	3	2	
	Local/district: Will affect the local area or district.	Probable: The impact will likely occur (Between a 50% to 75% chance of occurrence).	Long term: The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).	Barely reversible: The impact is unlikely to be reversed even with intense mitigation measures.	Significant loss of resources: The impact will result in significant loss of resources.	Medium cumulative impact: The impact would result in minor cumulative effects.	Medium: Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).	**Negative Medium Impact**
Continuing spread of IAP and weed species.	2	3	3	2	2	3	2	
	Local/district: Will affect the local area or district.	Probable: The impact will likely occur (Between a 50% to 75% chance of occurrence).	Long term: The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).	Partly reversible: The impact is partly reversible but more intense mitigation measures are required.	Marginal loss of resource: The impact will result in marginal loss of resources.	Medium cumulative impact: The impact would result in minor cumulative effects.	Medium: Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).	**Negative Medium Impact**
Ongoing displacement and direct mortalities of the faunal community (including SCC) due to continued disturbance (road collisions, noise, light, dust, vibration, poaching, etc.).	2	3	3	3	2	3	2	
	Local/district: Will affect the local area or district.	Probable: The impact will likely occur (Between a 50% to 75% chance of occurrence).	Long term: The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).	Barely reversible: The impact is unlikely to be reversed even with intense mitigation measures.	Marginal loss of resource: The impact will result in marginal loss of resources.	Medium cumulative impact: The impact would result in minor cumulative effects.	Medium: Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).	**Negative Medium Impact**

Table 4-6 Assessment of significance of potential impacts on terrestrial fauna and flora associated with the operational phase, post-mitigation

Impact	Post Mitigation							
	Extent	Probability	Duration	Reversibility	Irreplaceability	Cumulative Effect	Magnitude/ Intensity	**Significance**
Continued fragmentation and degradation of natural habitats and ecosystems.	1	2	2	2	2	3	2	
	Site: The impact will only affect the site.	Possible: The impact may occur (Between a 25% to 50% chance of occurrence).	Medium term: The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).	Partly reversible: The impact is partly reversible but more intense mitigation measures are required.	Marginal loss of resource: The impact will result in marginal loss of resources.	Medium cumulative impact: The impact would result in minor cumulative effects.	Medium: Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).	**Negative Low Impact**
Continuing spread of IAP and weed species.	1	2	2	2	2	2	2	
	Site: The impact will only affect the site.	Possible: The impact may occur (Between a 25% to 50% chance of occurrence).	Medium term: The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).	Partly reversible: The impact is partly reversible but more intense mitigation measures are required.	Marginal loss of resource: The impact will result in marginal loss of resources.	Low cumulative impact: The impact would result in insignificant cumulative effects.	Medium: Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).	**Negative Low Impact**
Ongoing displacement and direct mortalities of the faunal community (including SCC) due to continued disturbance (road collisions, noise, light, dust, vibration, poaching, etc.).	2	2	3	2	2	3	2	
	Local/district: Will affect the local area or district.	Possible: The impact may occur (Between a 25% to 50% chance of occurrence).	Long term: The impact and its effects will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).	Partly reversible: The impact is partly reversible but more intense mitigation measures are required.	Marginal loss of resource: The impact will result in marginal loss of resources.	Medium cumulative impact: The impact would result in minor cumulative effects.	Medium: Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).	**Negative Low Impact**

4.1.7.3 Cumulative Impacts

The impacts of projects are often assessed by comparing the post-project situation to a pre-existing baseline. Where projects can be considered in isolation this provides a good method of assessing a project's impact. However, in areas where baselines have already been affected, or where future development will continue to add to the impacts pre-existing in an area or region, it is appropriate to consider the cumulative effects of development or disturbance activities. This is similar to the concept of shifting baselines, which describes how the environmental baseline at a specific point in time may actually represent a significant change from the original state of the system. This section describes the potential cumulative impacts of the project on local fauna and flora specifically.

Cumulative impacts are assessed within the context of the extent of the proposed project area, other similar developments and activities in the area (existing and in-process), and general habitat loss and transformation resulting from any other activities in the area. Localised cumulative impacts include those from operations that are close enough (within 30 km) to potentially cause additive effects on the local environment or any sensitive receptors (relevant operations include nearby large road networks, other solar PV facilities, and power infrastructure). Relevant impacts include the overall reduction of foraging and habitat where reproduction takes place, dust deposition, noise and vibration, disruption of functional corridors of habitat important for movement and migration, disruption of waterways, groundwater drawdown, increase risk of collisions; and groundwater and surface water quality depletion.

Long-term cumulative impacts associated with the site development activities can lead to the loss of endemic and threatened species, including natural habitat and vegetation types, and these impacts can even lead to the degradation of conserved areas such as the adjacent game parks and reserves. In order to spatially quantify the cumulative effects of the proposed development, the project in isolation is compared with the overall effects of surrounding development (including total transformation and transformation as a result of new and proposed developments of a similar type, i.e., solar).

The total area within the 30 km buffer around the project area amounts to 303,763.04 ha, but when considering the transformation (34,062.04 ha) that has taken place within this radius, 269,701 ha of intact habitat remains according to the 2018 National Biodiversity Assessment. Therefore, the area within 30 km of the project has experienced approximately 11.21% loss in natural habitat. Considering this context, the project footprint for the options (according to the provided layout), and similar project exists in the 30 km region measuring a maximum of 36,449.32 ha, which includes the project options (as per the latest South African Renewable Energy EIA Application Database). This means that the total amount of remaining habitat lost as a result of solar projects in the region amounts to 22.6% (the sum of all related developments as a percentage of the total remaining habitat). Table 4-7 outlines the calculation procedure for the spatial assessment of cumulative impacts.

Table 4-7 Loss of habitat within a 30 km radius of the project

	Total Habitat (ha)	Total Loss (ha)	Tot. Remaining Habitat (ha) (Remnants)	Total Historical Loss	Cumulative Projects (ha)	Tot. Remaining Habitat (ha)	Cumulative Habitat Lost
Approximate Solar development cumulative effects (Spatial)	303,763.04	34,062.04	269,701.00	**11.21%**	68,729.11	**235,033.9**	**22.6 %**

The overall cumulative impact assessment is presented in Table 4-8 and Table 4-9and below. Note that this also accounts for the relative importance of the habitats within and adjacent to the project area, in the context of the value of the regional habitat. Approximately 11.21% of the habitat has already been lost, and as discussed above the proposed solar developments will result in a cumulative loss of approximately 22.6% from only similar developments (approved and in process) in the area, as such the cumulative impact from the proposed development is rated as "high", with overall medium

significance (Figure 4-2). This means that the careful spatial management and planning of the entire region must be a priority, and existing large infrastructure projects must be carefully monitored over the long term.

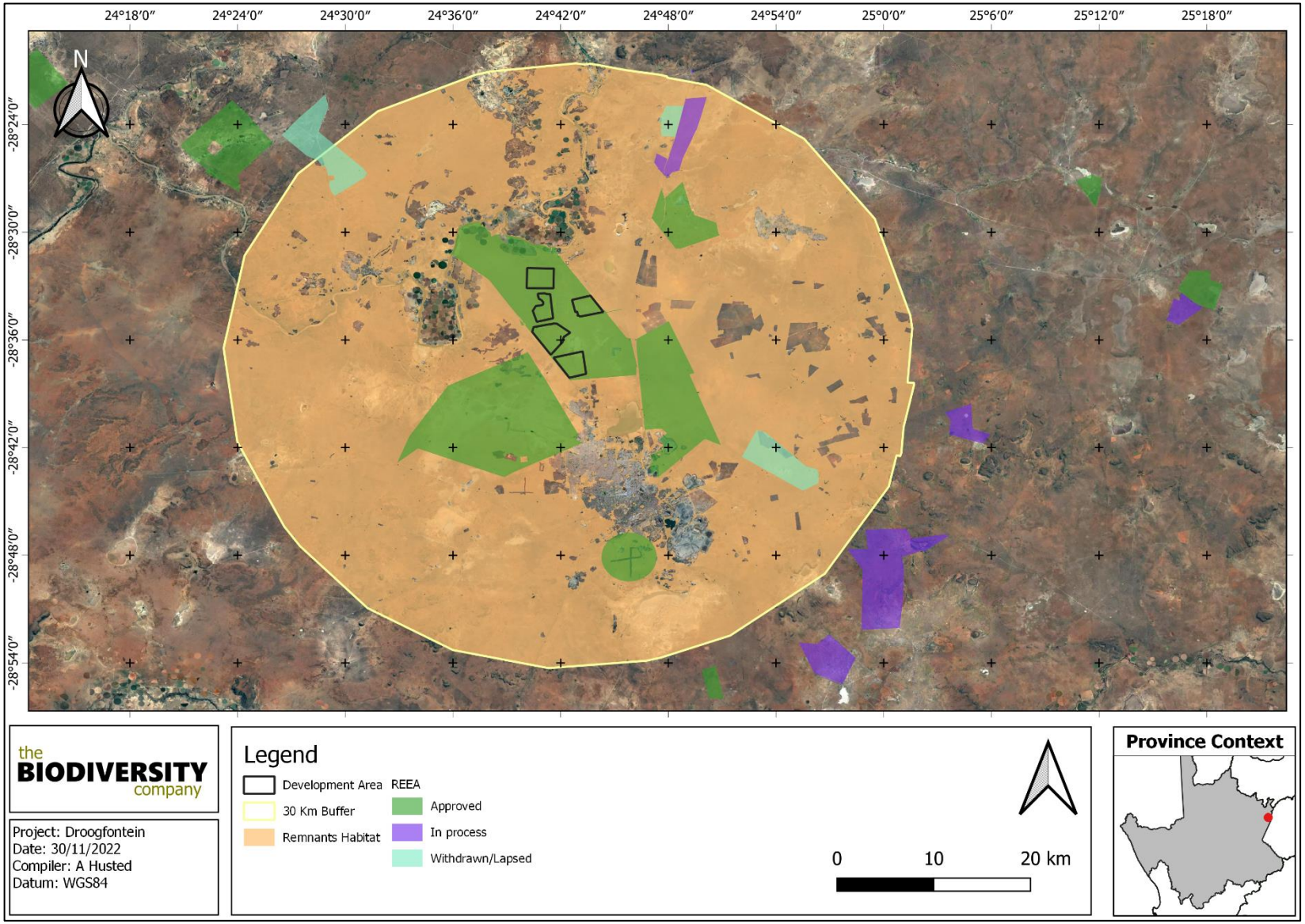


Figure 4-2 Map illustrating the additional renewable energy developments within the landscape overlaid onto the remnant vegetation types

Table 4-8 Assessment of the cumulative impacts to biodiversity associated with the proposed project, in isolation.

Impact	Project in Isolation							
	Extent	Probability	Duration	Reversibility	Irreplaceability	Cumulative Effect	Magnitude/ Intensity	**Significance**
	1	4	2	2	3	2	2	
Loss of habitat, and disruption of surrounding ecological corridors.	Site: The impact will only affect the site.	Definite: Impact will certainly occur (Greater than a 75% chance of occurrence).	Medium term: The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).	Partly reversible: The impact is partly reversible but more intense mitigation measures are required.	Significant loss of resources: The impact will result in significant loss of resources.	Low cumulative impact: The impact would result in insignificant cumulative effects.	Medium: Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).	**Negative Low Impact**

Table 4-9 Assessment of the cumulative impacts to biodiversity associated with the proposed project, cumulatively.

Impact	Cumulative Effect							
	Extent	Probability	Duration	Reversibility	Irreplaceability	Cumulative Effect	Magnitude/ Intensity	**Significance**
	3	4	3	3	3	4	2	
Loss of habitat, and disruption of surrounding ecological corridors.	Province/region: Will affect the entire province or region.	Definite: Impact will certainly occur (Greater than a 75% chance of occurrence).	Long term: The impact and its effects will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).	Barely reversible: The impact is unlikely to be reversed even with intense mitigation measures.	Significant loss of resources: The impact will result in significant loss of resources.	High cumulative impact: The impact would result in significant cumulative effects	Medium: Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).	**Negative Medium Impact**

4.1.8 Biodiversity Management Plan

The aim of the management outcomes is to present the mitigations in such a way that the can be incorporated into the Environmental Management Programme (EMPr), allowing for more successful implementation and auditing of the mitigations and monitoring guidelines. Table 4-10 presents the recommended mitigation measures and the respective timeframes, targets and performance indicators for the terrestrial study.

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

- Prevent the further loss and fragmentation of vegetation communities and the CBA areas in the vicinity of the project area;
- As far as possible, reduce the negative fragmentation effects of the development and enable safe movement of faunal species;
- Prevent the direct and indirect loss and disturbance of faunal species and community (including potentially occurring species of conservation concern); and
- Follow the guidelines for interpreting Site Ecological Importance (SEI).

Table 4-10 Mitigation measures including requirements for timeframes, roles and responsibilities for the terrestrial study

Impact Management Actions	Implementation		Monitoring	
	Phase	Responsible Party	Aspect	Frequency
Management outcome: Vegetation and Habitats				
Areas rated as High sensitivity outside of the direct project development areas should be declared as 'no-go' areas during the life of the project, and all efforts must be made to prevent access to these areas from construction workers and machinery. The infrastructure should be realigned to prioritise development within medium sensitivity areas. Mitigated development in High sensitivity areas is permissible, this includes brush-cutting beneath panels and not complete vegetation clearance. Areas rated as Medium sensitivity (or Low) should be prioritised for development.	Life of operation	Project manager, Environmental Officer	Development footprint	Ongoing
Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further than that proposed for the project. Clearing of vegetation should be minimized and avoided where possible. Brush cutting of vegetation beneath the panels should be, implemented, otherwise controlled grazing by small livestock like sheep. Technology alternatives should preferably avoid the clearing of vegetation underneath the panels	Life of operation	Project manager, Environmental Officer	Areas of indigenous vegetation	Ongoing
Where possible, existing access routes and walking paths must be made use of.	Construction/Operational Phase	Environmental Officer & Design Engineer	Roads and paths used	Ongoing
All laydown, chemical toilets etc. should be restricted to medium sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/closure phase has been concluded. No storage of vehicles or equipment will be allowed outside of the designated project areas.	Construction/Operational Phase	Environmental Officer & Design Engineer	Laydown areas	Ongoing
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood and wind events. This will also reduce the likelihood of encroachment by alien invasive plant species.	Operational phase	Environmental Officer & Contractor	Assess the state of rehabilitation and encroachment of alien vegetation	Quarterly for up to two years after the closure
Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion, or could be sustainably provided to the surrounding communities.	Operational and Decommissioning phase	Environmental Officer & Contractor	Woody material under powerline and in SS footprint	During Phase
A hydrocarbon spill management plan must be put in place, to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment may occur on site, unless necessary. All contaminated soil / yard	Life of operation	Environmental Officer & Contractor	Spill events, Vehicles dripping.	Ongoing

stone shall be treated in situ or removed and be placed in containers. Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them leaking and entering the environment.				
Storm Water run-off & Discharge Water Quality monitoring A carefully considered surface water/drainage management plan must be developed for the site including attention to the use of environmentally friendly cleaning chemicals for cleaning of panels during the operational phase.	Life of operation	Environmental Officer & Design Engineer	Water Quality and presence of erosion	Ongoing
It should be made an offence for any staff to take/ bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.	Life of operation	Project manager, Environmental Officer	Any instances	Ongoing
Consult a fire expert and compile and implement a fire management plan to minimise the risk of veld fires around the project site	Life of operation	Environmental Officer & Contractor	Fire Management	During Phase
Any individual of the protected plants that was observed needs a relocation or destruction permit in order for any individual that may be removed or destroyed due to the development. Preferably, the trees/plants should be avoided. Hi visibility flags must be placed near any protected plants in order to avoid any damage or destruction of the species. If left undisturbed the sensitivity and importance of these species needs to be part of the environmental awareness program.	Life of operation	Project manager, Environmental Officer Lodge Manager	Protected Plant species	Ongoing
Management outcome: Fauna				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency
The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments, • Signs must be put up to enforce this	Construction/Operational Phase	Project manager, Environmental Officer	Infringement into these areas	Ongoing
Noise must be kept to an absolute minimum during the evenings and at night, to minimize all possible disturbances to amphibian species and nocturnal mammals	Construction/Operational Phase	Environmental Officer	Noise levels	Ongoing
No trapping, killing, or poisoning of any wildlife is to be allowed. • Signs must be put up to enforce this;	Life of operation	Environmental Officer	Evidence of trapping etc	Ongoing
Outside lighting should be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided and sodium vapor (green/red) lights should be used wherever possible. Try incorporating motion detection lights as much as possible to reduce the duration of illumination. Heights of light columns to be minimised to reduce light spill. Baffles, hoods, or louvres to also be used to reduce light spill	Construction/Operational Phase	Project manager, Environmental Officer & Design Engineer	Light pollution and period of light.	Ongoing

All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited.	Life of operation	Health and Safety Officer	Compliance to the training.	Ongoing
Any holes/deep excavations must be dug and planted in a progressive manner; • Should the holes overnight they must be covered temporarily to ensure no small fauna species fall in and subsequently inspected prior to backfilling	Planning and construction	Environmental Officer & Contractor, Engineer	Presence of trapped animals and open holes	Ongoing
A qualified environmental control officer must be on site when construction begins. A site walk through is recommended by a suitably qualified ecologist prior to any construction activities, preferably during the wet season and any SSC should be noted. In situations where the threatened and protected plants must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated	Construction Phase	Environmental Officer, Contractor	Presence of any floral or faunal species.	During phase
Once the development layout has been confirmed, the open areas must be fenced off appropriately pre-construction in order to allow animals to move or be moved into these areas before breaking ground activities occur. Construction activities must take place systemically, especially in relation to the game farm area.	Planning/Construction Phase	Environmental Officer & Design Engineer	Areas not to be developed and construction direction	Ongoing
Wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed, the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area	Planning and construction	Environmental Officer & Contractor, Engineer	Fauna movement corridor	Ongoing
Fencing mitigations: • Top 2 strands must be smooth wire • Routinely retention loose wires • Minimum 30cm between wires Place markers on fences	Planning, construction, and operation	Environmental Officer & Contractor, Engineer	Monitor fences for slack wires	Ongoing

Management outcome: Alien Vegetation and fauna				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency
Compilation of and implementation of an alien vegetation management plan.	Life of operation	Project manager, Environmental Officer & Contractor	Assess presence and encroachment of alien vegetation	Twice a year

The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas	Construction/Operational Phase	Project manager, Environmental Officer & Contractor	Footprint Area	Life of operation
Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site	Life of operation	Environmental Officer & Health and Safety Officer	Presence of waste	Life of operation
A pest control plan must be put in place and implemented; it is imperative that poisons not be used due to the likely presence of SCCs	Life of operation	Environmental Officer & Health and Safety Officer	Evidence or presence of pests	Life of operation
Management outcome: Dust				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency
Dust-reducing mitigation measures must be put in place and strictly adhered to. This includes wetting of exposed soft soil surfaces. • No non environmentally friendly suppressants may be used, as this could result in pollution of water sources	Life of operation	Contractor	Dustfall	Dust monitoring program.
Management outcome: Waste management				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency
Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site. • Refuse bins will be emptied and secured; • Temporary storage of domestic waste shall be in covered waste skips; and • Maximum domestic waste storage period will be 10 days.	Construction Phase	Environmental Officer & Health and Safety Officer	Presence of waste	Life of operation
Toilets at the recommended Health and Safety standards must be provided. These should be emptied twice a day, to prevent staff from using the surrounding vegetation.	Construction Phase	Environmental Officer & Health and Safety Officer	Number of toilets per staff member. Waste levels	Daily
The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility. Under no circumstances may domestic waste be burned on site	Construction Phase	Environmental Officer & Health and Safety Officer	Availability of bins and the collection of the waste.	Ongoing
Refuse bins will be emptied and secured. Temporary storage of domestic waste shall be in covered waste skips. Maximum domestic waste storage period will be 10 days.	Construction Phase	Environmental Officer, Contractor & Health and Safety Officer	Management of bins and collection of waste	Ongoing
Suitable temporary solid waste facilities are to be incorporated into the design to prevent unsanitary conditions. These are to be cleared weekly and waste collected by the local waste management department. The residents must be encouraged to recycle.	Operational Phase	Project manager	Management of bins and collection of waste	Ongoing

Management outcome: Environmental awareness training				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency
All personnel and contractors to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of Red / Orange List species, their identification, conservation status and importance; and biology, habitat requirements and management requirements in the EA and EMPr. The avoidance and protection of the wetland areas must be included into a site induction. Contractors and employees must all undergo the induction and made aware of the "no-go" to be avoided.	Life of operation	Health and Safety Officer	Compliance to the training.	Ongoing
Management outcome: Erosion				
Impact Management Actions	**Implementation**		**Monitoring**	
	Phase	Responsible Party	Aspect	Frequency
Speed limits must be put in place to reduce erosion. • Reducing the dust generated by the listed activities above, especially the earthmoving machinery, through wetting the soil surface; putting up signs to enforce speed limit; and speed bumps built to force slow speeds; • Signs must be put up to enforce this.	Life of operation	Project manager, Environmental Officer	Water Runoff from road surfaces	Ongoing
Where possible, existing access routes and walking paths must be made use of.	Life of operation	Project manager, Environmental Officer	Routes used within the area	Ongoing
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation, to prevent erosion during flood events and strong winds.	Life of operation	Project manager, Environmental Officer	Re-establishment of indigenous vegetation	Progressively
A stormwater management plan must be compiled and implemented.	Life of operation	Project manager, Environmental Officer	Management plan	Before construction phase: Ongoing

5 Recommendations

The following recommendations are provided:

- Compilation of a search and rescue plan for *Vachellia erioloba* (Camelthorn), with intent to rescue as many individuals as feasible. A permit is required for the removal, relocation and/or destruction of the species.
- A search and rescue plan needs to be implemented for the proposed project for the floral and faunal component, especially for Black Footed Cat.

6 Conclusion and Impact Statement

6.1 Conclusion

The project area has received limited impacts, both currently and historically. The Woody Thornveld habitat units can be regarded as important, not only within the within the local landscape, but also regionally; as they are the only remaining areas used for habitat, reproduction foraging and movement corridors for fauna. The habitat sensitivity of the woody Thornveld is regarded as high, due to floral and faunal species recorded as well as the role of this intact habitat to biodiversity within the local landscape, not to mention the sensitivity according to various ecological datasets, the high sensitivity areas still:

- Serve as and represent ONA, as identified by the conservation plan, however, may be considered as ESA;
- Provide overall intermediate ecological benefits for the area; and
- Support various organisms (including SCC) and may play an important role in the ecosystem if left to recover from the superficial impacts.

The completion of the terrestrial biodiversity assessment found that the woody Thornveld habitats which overlap with the screening report is of high sensitivity and thus disputes the screening report in that regard, these areas are considered important for their ecological role in the region.

The ecological integrity, importance and functioning of these areas play a crucial role and an important habitat for various fauna and flora. The preservation of this systems is the most important aspect to consider for the proposed project, even more so due to the sensitivity of the areas. These habitats need to be protected and improved due to the role of this crucial and limited habitat, as well as a water resource within this disturbed local area.

Option C and Option E are the two preferred options due to the predominantly Medium sensitivity associated with these areas. A considerable extent of Option D is suitable for development, and also a portion of Option A also due to the assigned Medium sensitivity areas. It is recommended that Option B not be considered for development, and also areas assigned a High sensitivity within the other options. A consideration to avoid development of Option A and (more so) Option B is the presence of the Nationally Protected Tree, Camelthorn (*Vachellia Erioloba*) but also other woody plants.

6.2 Impact Statement

The main expected impacts of the proposed infrastructure will include the following:

- Habitat loss and fragmentation;
- Degradation of surrounding habitat;
- Disturbance and displacement caused during the construction and maintenance phases; and
- Direct mortality during the construction phase.

Mitigation measures as described in this report must be implemented to reduce the significance of the risk. Considering that the area that has been identified as being of significance for biodiversity maintenance and ecological processes (Moderate and High sensitivity), development may proceed but with caution and only with the implementation of mitigation measures.

Considering the above-mentioned information, no fatal flaws are evident for the proposed project. It is the opinion of the specialists that the project location, may be favourably considered on condition that all prescribed mitigation measures and supporting recommendations are implemented.

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8 Appendix Items

8.1 Appendix A – Flora species expected to occur in the project area.

Family	Species	Author1	Rank1	Sp2	IUCN	Ecology
Cucurbitaceae	*Acanthosicyos naudinianus*	(Sond.) C.Jeffrey			LC	Indigenous
Amaranthaceae	*Achyranthes aspera*	L.	var.	aspera		Not indigenous; Naturalised
Lamiaceae	*Acrotome inflata*	Benth.			LC	Indigenous
Passifloraceae	*Adenia repanda*	(Burch.) Engl.			LC	Indigenous
Asteraceae	*Adenostemma caffrum*	DC.			LC	Indigenous
Amaranthaceae	*Aerva leucura*	Moq.			LC	Indigenous
Cyperaceae	*Afroscirpoides dioeca*	(Kunth) Garcia-Madr.				Indigenous
Poaceae	*Agrostis lachnantha*	Nees	var.	lachnantha	LC	Indigenous
Hyacinthaceae	*Albuca dyeri*	(Poelln.) J.C.Manning & Goldblatt			LC	Indigenous; Endemic
Hyacinthaceae	*Albuca prasina*	(Ker Gawl.) J.C.Manning & Goldblatt				Indigenous
Hyacinthaceae	*Albuca sp.*					
Hyacinthaceae	*Albuca virens*	(Ker Gawl.) J.C.Manning & Goldblatt	subsp.	virens	LC	Indigenous
Hyacinthaceae	*Albuca virens*	(Ker Gawl.) J.C.Manning & Goldblatt	subsp.	arida	LC	Indigenous
Rosaceae	*Alchemilla elongata*	Eckl. & Zeyh.	var.	elongata	NE	Indigenous
Orobanchaceae	*Alectra pumila*	Benth.			LC	Indigenous
Asphodelaceae	*Aloe grandidentata*	Salm-Dyck			LC	Indigenous
Asphodelaceae	*Aloe hereroensis*	Engl.				Indigenous
Asphodelaceae	*Aloe maculata*	All.	subsp.	maculata	LC	Indigenous
Asphodelaceae	*Aloe sp.*					
Aizoaceae	*Aloinopsis rubrolineata*	(N.E.Br.) Schwantes			LC	Indigenous; Endemic
Amaranthaceae	*Alternanthera pungens*	Kunth				Not indigenous; Naturalised
Amaranthaceae	*Alternanthera sessilis*	(L.) DC.				Not indigenous; Naturalised; Invasive
Malvaceae	*Althaea ludwigii*	L.			LC	Indigenous
Amaranthaceae	*Amaranthus deflexus*	L.				Not indigenous; Naturalised
Amaranthaceae	*Amaranthus dinteri*	Schinz	subsp.	dinteri	NE	Indigenous
Amaranthaceae	*Amaranthus muricatus*	(Moq.) Hieron.				Not indigenous; Naturalised
Amaranthaceae	*Amaranthus praetermissus*	Brenan			LC	Indigenous
Amaranthaceae	*Amaranthus schinzianus*	Thell.			LC	Indigenous
Amaranthaceae	*Amaranthus thunbergii*	Moq.			LC	Indigenous
Amaranthaceae	*Amaranthus viridis*	L.				Not indigenous; Naturalised

Asteraceae	*Amellus strigosus*	(Thunb.) Less.	sub sp.	strigosus	LC	Indigenous; Endemic
Asteraceae	*Amellus tridactylus*	DC.	sub sp.	tridactylus	LC	Indigenous; Endemic
Amaryllidaceae	*Ammocharis coranica*	(Ker Gawl.) Herb.			LC	Indigenous
Asteraceae	*Amphiglossa triflora*	DC.			LC	Indigenous
Boraginaceae	*Anchusa riparia*	A.DC.			LC	Indigenous
Poaceae	*Andropogon schirensis*	Hochst. ex A.Rich.			LC	Indigenous
Asteraceae	*Anthemis cotula*	L.				Not indigenous; Naturalised
Poaceae	*Anthephora pubescens*	Nees			LC	Indigenous
Rubiaceae	*Anthospermum rigidum*	Eckl. & Zeyh.	sub sp.	rigidum	LC	Indigenous
Menispermaceae	*Antizoma angustifolia*	(Burch.) Miers ex Harv.			LC	Indigenous
Scrophulariaceae	*Aptosimum elongatum*	(Hiern) Engl.			LC	Indigenous
Scrophulariaceae	*Aptosimum indivisum*	Burch. ex Benth.			LC	Indigenous
Scrophulariaceae	*Aptosimum marlothii*	(Engl.) Hiern			LC	Indigenous
Asteraceae	*Arctotheca calendula*	(L.) Levyns			LC	Indigenous
Asteraceae	*Arctotis venusta*	Norl.			LC	Indigenous
Papaveraceae	*Argemone ochroleuca*	Sweet	sub sp.	ochroleuca		Not indigenous; Naturalised; Invasive
Fabaceae	*Argyrolobium pauciflorum*	Eckl. & Zeyh.			LC	Indigenous
Poaceae	*Aristida adscensionis*	L.			LC	Indigenous
Poaceae	*Aristida congesta*	Roem. & Schult.	sub sp.	barbicollis	LC	Indigenous
Poaceae	*Aristida congesta*	Roem. & Schult.	sub sp.	congesta	LC	Indigenous
Poaceae	*Aristida meridionalis*	Henrard			LC	Indigenous
Poaceae	*Aristida mollissima*	Pilg.	sub sp.	mollissima	LC	Indigenous
Poaceae	*Aristida scabrivalvis*	Hack.	sub sp.	scabrivalvis	LC	Indigenous
Poaceae	*Aristida sp.*					
Poaceae	*Aristida stipitata*	Hack.	sub sp.	graciliflora	LC	Indigenous
Poaceae	*Aristida stipitata*	Hack.	sub sp.	spicata	LC	Indigenous
Poaceae	*Aristida vestita*	Thunb.			LC	Indigenous
Asparagaceae	*Asparagus bechuanicus*	Baker			LC	Indigenous
Asparagaceae	*Asparagus cooperi*	Baker			LC	Indigenous
Asparagaceae	*Asparagus glaucus*	Kies			LC	Indigenous
Asparagaceae	*Asparagus laricinus*	Burch.			LC	Indigenous
Asparagaceae	*Asparagus suaveolens*	Burch.			LC	Indigenous
Asparagaceae	*Asparagus virgatus*	Baker			LC	Indigenous
Apocynaceae	*Aspidoglossum interruptum*	(E.Mey.) Bullock			LC	Indigenous

Aspleniaceae	*Asplenium cordatum*	(Thunb.) Sw.			LC	Indigenous
Amaranthaceae	*Atriplex erosa*	G.Bruckn. & I.Verd.			LC	Indigenous; Endemic
Amaranthaceae	*Atriplex lindleyi*	Moq.	sub sp.	inflata		Not indigenous; Naturalised; Invasive
Amaranthaceae	*Atriplex rosea*	L.				Not indigenous; Naturalised
Amaranthaceae	*Atriplex semibaccata*	R.Br.				Not indigenous; Naturalised; Invasive
Amaranthaceae	*Atriplex suberecta*	I.Verd.			LC	Not indigenous; Naturalised; Invasive
Amaranthaceae	*Atriplex vestita*	(Thunb.) Aellen	var.	appendiculata	LC	Indigenous
Iridaceae	*Babiana bainesii*	Baker			LC	Indigenous
Iridaceae	*Babiana hypogaea*	Burch.			LC	Indigenous
Pottiaceae	*Barbula sp.*					
Acanthaceae	*Barleria bechuanensis*	C.B.Clarke			LC	Indigenous; Endemic
Acanthaceae	*Barleria rigida*	Willd. ex Nees			LC	Indigenous
Acanthaceae	*Barleria rigida*	Willd. ex Nees	var.	rigida		Indigenous
Bartramiaceae	*Bartramia compacta*	Hornsch.	var.	compacta		Indigenous
Elatinaceae	*Bergia sp.*					
Asteraceae	*Berkheya pinnatifida*	(Thunb.) Thell.	sub sp.	pinnatifida	LC	Indigenous; Endemic
Asteraceae	*Bidens biternata*	(Lour.) Merr. & Sherff				Not indigenous; Naturalised
Acanthaceae	*Blepharis integrifolia*	(L.f.) E.Mey. ex Schinz	var.	integrifolia	LC	Indigenous
Acanthaceae	*Blepharis marginata*	(Nees) C.B.Clarke			LC	Indigenous; Endemic
Nyctaginaceae	*Boerhavia cordobensis*	Kuntze				Not indigenous; Naturalised
Nyctaginaceae	*Boerhavia diffusa*	L.	var.	diffusa		Not indigenous; Naturalised
Nyctaginaceae	*Boerhavia sp.*					
Fabaceae	*Bolusanthus speciosus*	(Bolus) Harms			LC	Indigenous
Capparaceae	*Boscia albitrunca*	(Burch.) Gilg & Gilg-Ben.			LC	Indigenous
Poaceae	*Brachiaria brizantha*	(A.Rich.) Stapf			LC	Indigenous
Poaceae	*Brachiaria eruciformis*	(Sm.) Griseb.			LC	Indigenous
Poaceae	*Brachiaria marlothii*	(Hack.) Stent			LC	Indigenous
Poaceae	*Brachiaria nigropedata*	(Ficalho & Hiern) Stapf			LC	Indigenous
Poaceae	*Brachiaria serrata*	(Thunb.) Stapf			LC	Indigenous
Poaceae	*Bromus sp.*					
Bryaceae	*Bryum argenteum*	Hedw.				Indigenous
Bryaceae	*Bryum torquescens*	Bruch ex De Not.				Indigenous
Scrophulariaceae	*Buddleja saligna*	Willd.			LC	Indigenous
Boraginaceae	*Buglossoides arvensis*	(L.) I.M.Johnst.				Not indigenous; Naturalised
Asphodelaceae	*Bulbine abyssinica*	A.Rich.			LC	Indigenous

Asphodelaceae	*Bulbine asphodeloides*	(L.) Spreng.			LC	Indigenous
Asphodelaceae	*Bulbine narcissifolia*	Salm-Dyck			LC	Indigenous
Cyperaceae	*Bulbostylis hispidula*	(Vahl) R.W.Haines	sub sp.	pyriformis	LC	Indigenous
Fabaceae	*Calobota cuspidosa*	(Burch.) Boatwr. & B.-E.van Wyk			LC	Indigenous
Poaceae	*Cenchrus ciliaris*	L.			LC	Indigenous
Poaceae	*Cenchrus spinifex*	Cav.			NE	Not indigenous; Naturalised; Invasive
Caryophyllaceae	*Cerastium capense*	Sond.			LC	Indigenous
Apocynaceae	*Ceropegia differens*	Bruyns	sub sp.	differens		Indigenous; Endemic
Scrophulariaceae	*Chaenostoma halimifolium*	Benth.			LC	Indigenous
Scrophulariaceae	*Chaenostoma patrioticum*	(Hiern) Kornhall			LC	Indigenous
Scrophulariaceae	*Chaenostoma sp.*					
Fabaceae	*Chamaecrista biensis*	(Steyaert) Lock			LC	Indigenous
Fabaceae	*Chamaecrista capensis*	(Thunb.) E.Mey.	var.	capensis	LC	Indigenous
Fabaceae	*Chamaecrista capensis*	(Thunb.) E.Mey.				Indigenous
Verbenaceae	*Chascanum hederaceum*	(Sond.) Moldenke	var.	hederaceum	LC	Indigenous
Verbenaceae	*Chascanum pinnatifidum*	(L.f.) E.Mey.	var.	pinnatifidum	LC	Indigenous
Verbenaceae	*Chascanum pinnatifidum*	(L.f.) E.Mey.				Indigenous
Pteridaceae	*Cheilanthes eckloniana*	(Kunze) Mett.			LC	Indigenous
Pteridaceae	*Cheilanthes hirta*	Sw.	var.	brevipilosa		Indigenous
Amaranthaceae	*Chenopodiastrum murale*	(L.) S.Fuentes, Uotila & Borsch				Not indigenous; Naturalised; Invasive
Amaranthaceae	*Chenopodium giganteum*	D.Don				Not indigenous; Naturalised
Amaranthaceae	*Chenopodium opulifolium*	Schrad. ex W.D.J.Koch & Ziz	var.	opulifolium		Not indigenous; Naturalised
Poaceae	*Chloris virgata*	Sw.			LC	Indigenous
Agavaceae	*Chlorophytum fasciculatum*	(Baker) Kativu			LC	Indigenous
Apiaceae	*Choritaenia capensis*	Benth.			LC	Indigenous; Endemic
Asteraceae	*Chrysocoma ciliata*	L.			LC	Indigenous
Asteraceae	*Chrysocoma obtusata*	(Thunb.) Ehr.Bayer			LC	Indigenous
Poaceae	*Chrysopogon serrulatus*	Trin.			LC	Indigenous
Asteraceae	*Cineraria aspera*	Thunb.			LC	Indigenous
Asteraceae	*Cineraria lyratiformis*	Cron			LC	Indigenous
Cucurbitaceae	*Citrullus lanatus*	(Thunb.) Matsum. & Nakai			LC	Indigenous
Bruchiaceae	*Cladophascum gymnomitrioides*	(Dixon) Dixon				Indigenous
Ranunculaceae	*Clematis brachiata*	Thunb.			LC	Indigenous
Cleomaceae	*Cleome angustifolia*	Forssk.	sub sp.	diandra	LC	Indigenous

Cleomaceae	*Cleome gynandra*	L.			LC	Indigenous
Cleomaceae	*Cleome monophylla*	L.			LC	Indigenous
Cleomaceae	*Cleome rubella*	Burch.			LC	Indigenous
Cucurbitaceae	*Coccinia rehmannii*	Cogn.			LC	Indigenous
Cucurbitaceae	*Coccinia sessilifolia*	(Sond.) Cogn.			LC	Indigenous
Poaceae	*Coelachyrum yemenicum*	(Schweinf.) S.M.Phillips			LC	Indigenous
Colchicaceae	*Colchicum burkei*	(Baker) J.C.Manning & Vinn.			LC	Indigenous
Colchicaceae	*Colchicum leistneri*	(U.Mull.-Doblies & D.Mull.-Doblies) C.Archer			LC	Indigenous
Colchicaceae	*Colchicum melanthioides*	(Willd.) J.C.Manning & Vinn.	subsp.	melanthioides	LC	Indigenous
Combretaceae	*Combretum erythrophyllum*	(Burch.) Sond.			LC	Indigenous
Commelinaceae	*Commelina africana*	L.	var.	africana	LC	Indigenous
Commelinaceae	*Commelina africana*	L.	var.	barberae	LC	Indigenous
Commelinaceae	*Commelina benghalensis*	L.			LC	Indigenous
Commelinaceae	*Commelina livingstonii*	C.B.Clarke			LC	Indigenous
Nyctaginaceae	*Commicarpus pentandrus*	(Burch.) Heimerl			LC	Indigenous
Nyctaginaceae	*Commicarpus sp.*					
Convolvulaceae	*Convolvulus boedeckerianus*	Peter			LC	Indigenous; Endemic
Convolvulaceae	*Convolvulus multifidus*	Thunb.			LC	Indigenous; Endemic
Convolvulaceae	*Convolvulus ocellatus*	Hook.	var.	ocellatus	LC	Indigenous
Convolvulaceae	*Convolvulus sagittatus*	Thunb.			LC	Indigenous
Asteraceae	*Conyza podocephala*	DC.				Indigenous
Asteraceae	*Conyza scabrida*	DC.				Indigenous
Corbichoniaceae	*Corbichonia decumbens*	(Forssk.) Exell			LC	Indigenous
Malvaceae	*Corchorus asplenifolius*	Burch.			LC	Indigenous
Caryophyllaceae	*Corrigiola litoralis*	L.	subsp.	litoralis	NE	Indigenous
Asteraceae	*Cotula anthemoides*	L.			LC	Indigenous
Asteraceae	*Cotula microglossa*	(DC.) O.Hoffm. & Kuntze ex Kuntze			LC	Indigenous; Endemic
Asteraceae	*Cotula sp.*					
Crassulaceae	*Cotyledon campanulata*	Marloth			LC	Indigenous; Endemic
Crassulaceae	*Cotyledon orbiculata*	L.	var.	dactylopsis	LC	Indigenous; Endemic
Asteraceae	*Crassothonna cylindrica*	(Lam.) B.Nord.			LC	Indigenous
Crassulaceae	*Crassula capitella*	Thunb.	subsp.	nodulosa	LC	Indigenous
Amaryllidaceae	*Crinum bulbispermum*	(Burm.f.) Milne-Redh. & Schweick.			LC	Indigenous

Amaryllidaceae	*Crinum lugardiae*	N.E.Br.			LC	Indigenous
Fabaceae	*Crotalaria barnabassii*	Dinter ex Baker f.				Indigenous
Fabaceae	*Crotalaria burkeana*	Benth.			LC	Indigenous
Fabaceae	*Crotalaria griquensis*	L.Bolus			LC	Indigenous
Fabaceae	*Crotalaria lotoides*	Benth.			LC	Indigenous
Fabaceae	*Crotalaria sphaerocarpa*	Perr. ex DC.	subsp.	sphaerocarpa	LC	Indigenous
Cucurbitaceae	*Cucumis heptadactylus*	Naudin			LC	Indigenous; Endemic
Cucurbitaceae	*Cucumis myriocarpus*	Naudin	subsp.	leptodermis	LC	Indigenous
Cucurbitaceae	*Cucumis myriocarpus*	Naudin	subsp.	myriocarpus	LC	Indigenous
Cucurbitaceae	*Cucumis zeyheri*	Sond.			LC	Indigenous
Fabaceae	*Cullen biflora*	(Harv.) C.H.Stirt.			DD	Indigenous
Fabaceae	*Cullen tomentosum*	(Thunb.) J.W.Grimes			LC	Indigenous
Convolvulaceae	*Cuscuta appendiculata*	Engelm.			LC	Indigenous; Endemic
Tecophilaeaceae	*Cyanella lutea*	L.f.				Indigenous
Apiaceae	*Cyclospermum leptophyllum*	(Pers.) Sprague ex Britton & P.Wilson				Not indigenous; Naturalised
Poaceae	*Cymbopogon caesius*	(Hook. & Arn.) Stapf			LC	Indigenous
Poaceae	*Cymbopogon marginatus*	(Steud.) Stapf ex Burtt Davy			LC	Indigenous
Poaceae	*Cymbopogon nardus*	(L.) Rendle			LC	Indigenous
Poaceae	*Cymbopogon pospischilii*	(K.Schum.) C.E.Hubb.			NE	Indigenous
Apocynaceae	*Cynanchum orangeanum*	(Schltr.) N.E.Br.			LC	Indigenous
Apocynaceae	*Cynanchum virens*	(E.Mey.) D.Dietr.			LC	Indigenous
Poaceae	*Cynodon dactylon*	(L.) Pers.			LC	Indigenous
Poaceae	*Cynodon incompletus*	Nees			LC	Indigenous; Endemic
Cyperaceae	*Cyperus capensis*	(Steud.) Endl.			LC	Indigenous; Endemic
Cyperaceae	*Cyperus decurvatus*	(C.B.Clarke) C.Archer & Goetgh.			LC	Indigenous
Cyperaceae	*Cyperus esculentus*	L.	var.	esculentus	LC	Indigenous
Cyperaceae	*Cyperus fastigiatus*	Rottb.			LC	Indigenous
Cyperaceae	*Cyperus laevigatus*	L.			LC	Indigenous
Cyperaceae	*Cyperus margaritaceus*	Vahl	var.	margaritaceus	LC	Indigenous
Cyperaceae	*Cyperus marlothii*	Boeckeler			LC	Indigenous
Cyperaceae	*Cyperus textilis*	Thunb.			LC	Indigenous; Endemic
Cyperaceae	*Cyperus usitatus*	Burch.			LC	Indigenous
Lobeliaceae	*Cyphia stenopetala*	Diels			LC	Indigenous
Amaranthaceae	*Cyphocarpa angustifolia*	(Moq.) Lopr.			LC	Indigenous
Vitaceae	*Cyphostemma hereroense*	(Schinz) Desc. ex Wild & R.B.Drumm.			LC	Indigenous
Solanaceae	*Datura ferox*	L.				Not indigenous; Naturalised; Invasive

Solanaceae	*Datura stramonium*	L.				Not indigenous; Naturalised; Invasive
Hyacinthaceae	*Daubenya comata*	(Burch. ex Baker) J.C.Manning & A.M.van der Merwe			LC	Indigenous; Endemic
Aizoaceae	*Delosperma sp.*					
Asteraceae	*Denekia capensis*	Thunb.			LC	Indigenous
Apiaceae	*Deverra burchellii*	(DC.) Eckl. & Zeyh.			LC	Indigenous
Poaceae	*Diandrochloa pusilla*	(Hack.) De Winter			LC	Indigenous
Caryophyllaceae	*Dianthus micropetalus*	Ser.			LC	Indigenous
Poaceae	*Dichanthium annulatum*	(Forssk.) Stapf	var.	papillosum	LC	Indigenous
Fabaceae	*Dichilus gracilis*	Eckl. & Zeyh.			LC	Indigenous
Acanthaceae	*Dicliptera leistneri*	K.Balkwill			LC	Indigenous; Endemic
Scrophulariaceae	*Diclis petiolaris*	Benth.			LC	Indigenous
Scrophulariaceae	*Diclis rotundifolia*	(Hiern) Hilliard & B.L.Burtt			LC	Indigenous
Asteraceae	*Dicoma capensis*	Less.			LC	Indigenous
Asteraceae	*Dicoma macrocephala*	DC.			LC	Indigenous
Asteraceae	*Dicoma schinzii*	O.Hoffm.			LC	Indigenous
Poaceae	*Digitaria eriantha*	Steud.			LC	Indigenous
Poaceae	*Digitaria polyphylla*	Henrard			LC	Indigenous
Poaceae	*Digitaria sanguinalis*	(L.) Scop.			NE	Not indigenous; Naturalised
Poaceae	*Digitaria ternata*	(A.Rich.) Stapf			LC	Indigenous
Asteraceae	*Dimorphotheca sp.*					
Ebenaceae	*Diospyros austroafricana*	De Winter	var.	microphylla	LC	Indigenous
Ebenaceae	*Diospyros lycioides*	Desf.	sub sp.	lycioides	LC	Indigenous
Hyacinthaceae	*Dipcadi glaucum*	(Burch. ex Ker Gawl.) Baker			LC	Indigenous
Hyacinthaceae	*Dipcadi gracillimum*	Baker			LC	Indigenous
Hyacinthaceae	*Dipcadi marlothii*	Engl.			LC	Indigenous
Hyacinthaceae	*Dipcadi viride*	(L.) Moench			LC	Indigenous
Hyacinthaceae	*Drimia fasciata*	(B.Nord.) J.C.Manning & Goldblatt			LC	Indigenous
Hyacinthaceae	*Drimia intricata*	(Baker) J.C.Manning & Goldblatt			LC	Indigenous
Hyacinthaceae	*Drimia physodes*	(Jacq.) Jessop			LC	Indigenous
Iridaceae	*Duthiastrum linifolium*	(E.Phillips) M.P.de Vos			LC	Indigenous; Endemic
Amaranthaceae	*Dysphania carinata*	(R.Br.) Mosyakin & Clemants				Not indigenous; Naturalised; Invasive
Amaranthaceae	*Dysphania cristata*	(F.Muell.) Mosyakin & Clemants				Not indigenous; Naturalised; Invasive
Amaranthaceae	*Dysphania multifida*	(L.) Mosyakin & Clemants				Not indigenous; Naturalised; Invasive
Amaranthaceae	*Dysphania schraderiana*	(Schult.) Mosyakin & Clemants				Indigenous
Poaceae	*Echinochloa colona*	(L.) Link			LC	Indigenous
Poaceae	*Echinochloa crus-galli*	(L.) P.Beauv.			LC	Indigenous

Poaceae	*Echinochloa holubii*	(Stapf) Stapf			LC	Indigenous
Boraginaceae	*Ehretia alba*	Retief & A.E.van Wyk			LC	Indigenous
Poaceae	*Ehrharta calycina*	Sm.			LC	Indigenous
Cyperaceae	*Eleocharis dregeana*	Steud.			LC	Indigenous
Fabaceae	*Elephantorrhiza elephantina*	(Burch.) Skeels			LC	Indigenous
Poaceae	*Eleusine coracana*	(L.) Gaertn.	subsp.	africana	LC	Indigenous
Poaceae	*Elionurus muticus*	(Spreng.) Kunth			LC	Indigenous
Poaceae	*Enneapogon cenchroides*	(Licht. ex Roem. & Schult.) C.E.Hubb.			LC	Indigenous
Poaceae	*Enneapogon desvauxii*	P.Beauv.			LC	Indigenous
Poaceae	*Enneapogon scaber*	Lehm.			LC	Indigenous
Poaceae	*Enneapogon scoparius*	Stapf			LC	Indigenous
Poaceae	*Eragrostis barrelieri*	Daveau			NE	Not indigenous; Naturalised
Poaceae	*Eragrostis bicolor*	Nees			LC	Indigenous
Poaceae	*Eragrostis biflora*	Hack. ex Schinz			LC	Indigenous
Poaceae	*Eragrostis chloromelas*	Steud.			LC	Indigenous
Poaceae	*Eragrostis cilianensis*	(All.) Vignolo ex Janch.			LC	Indigenous
Poaceae	*Eragrostis curvula*	(Schrad.) Nees			LC	Indigenous
Poaceae	*Eragrostis echinochloidea*	Stapf			LC	Indigenous
Poaceae	*Eragrostis gummiflua*	Nees			LC	Indigenous
Poaceae	*Eragrostis homomalla*	Nees			LC	Indigenous
Poaceae	*Eragrostis lehmanniana*	Nees	var.	lehmanniana	LC	Indigenous
Poaceae	*Eragrostis macrochlamys*	Pilg.	var.	wilmaniae	NE	Indigenous
Poaceae	*Eragrostis mexicana*	(Hornem.) Link	subsp.	virescens	NE	Not indigenous; Naturalised
Poaceae	*Eragrostis nindensis*	Ficalho & Hiern			LC	Indigenous
Poaceae	*Eragrostis obtusa*	Munro ex Ficalho & Hiern			LC	Indigenous
Poaceae	*Eragrostis pallens*	Hack.			LC	Indigenous
Poaceae	*Eragrostis pilosa*	(L.) P.Beauv.			LC	Indigenous
Poaceae	*Eragrostis porosa*	Nees			LC	Indigenous
Poaceae	*Eragrostis procumbens*	Nees			LC	Indigenous
Poaceae	*Eragrostis pseudobtusa*	De Winter			NE	Indigenous; Endemic
Poaceae	*Eragrostis remotiflora*	De Winter			LC	Indigenous; Endemic
Poaceae	*Eragrostis sp.*					
Poaceae	*Eragrostis stapfii*	De Winter			LC	Indigenous
Poaceae	*Eragrostis superba*	Peyr.			LC	Indigenous
Poaceae	*Eragrostis tef*	(Zuccagni) Trotter			NE	Not indigenous; Naturalised
Poaceae	*Eragrostis trichophora*	Coss. & Durieu			LC	Indigenous
Poaceae	*Eragrostis truncata*	Hack.			LC	Indigenous
Asteraceae	*Erigeron bonariensis*	L.				Not indigenous; Naturalised; Invasive

Asteraceae	*Erigeron canadensis*	L.				Not indigenous; Naturalised; Invasive
Asteraceae	*Eriocephalus ambiguus*	(DC.) M.A.N.Mull.			LC	Indigenous
Asteraceae	*Eriocephalus karooicus*	M.A.N.Mull.			LC	Indigenous; Endemic
Poaceae	*Eriochloa fatmensis*	(Hochst. & Steud.) Clayton			LC	Indigenous
Ruscaceae	*Eriospermum corymbosum*	Baker			LC	Indigenous
Ruscaceae	*Eriospermum porphyrium*	Archibald			LC	Indigenous
Ruscaceae	*Eriospermum sp.*					
Brassicaceae	*Erucastrum griquense*	(N.E.Br.) O.E.Schulz			LC	Indigenous
Fabaceae	*Erythrina zeyheri*	Harv.			LC	Indigenous
Fabaceae	*Erythrostemon gilliesii*	(Hook.) Klotzsch				Not indigenous; Naturalised; Invasive
Ebenaceae	*Euclea crispa*	(Thunb.) Gurke	sub sp.	ovata	LC	Indigenous
Hyacinthaceae	*Eucomis autumnalis*	(Mill.) Chitt.	sub sp.	autumnalis	NE	Indigenous
Euphorbiaceae	*Euphorbia crassipes*	Marloth			LC	Indigenous
Euphorbiaceae	*Euphorbia davyi*	N.E.Br.			LC	Indigenous
Euphorbiaceae	*Euphorbia duseimata*	R.A.Dyer			LC	Indigenous
Euphorbiaceae	*Euphorbia flanaganii*	N.E.Br.			VU	Indigenous; Endemic
Euphorbiaceae	*Euphorbia glanduligera*	Pax			LC	Indigenous
Euphorbiaceae	*Euphorbia inaequilatera*	Sond.	var.	inaequilatera	NE	Indigenous
Euphorbiaceae	*Euphorbia inaequilatera*	Sond.			LC	Indigenous
Euphorbiaceae	*Euphorbia juttae*	Dinter			LC	Indigenous
Euphorbiaceae	*Euphorbia spartaria*	N.E.Br.			LC	Indigenous
Asteraceae	*Euryops asparagoides*	(Licht. ex Less.) DC.			LC	Indigenous
Asteraceae	*Euryops subcarnosus*	DC.	sub sp.	vulgaris	LC	Indigenous
Poaceae	*Eustachys paspaloides*	(Vahl) Lanza & Mattei			LC	Indigenous
Convolvulaceae	*Falkia oblonga*	Bernh. ex C.Krauss			LC	Indigenous
Polygonaceae	*Fallopia convolvulus*	(L.) Holub				Not indigenous; Naturalised
Asteraceae	*Felicia fascicularis*	DC.			LC	Indigenous
Asteraceae	*Felicia filifolia*	(Vent.) Burtt Davy	sub sp.	filifolia	LC	Indigenous
Asteraceae	*Felicia muricata*	(Thunb.) Nees	sub sp.	muricata	LC	Indigenous
Asteraceae	*Felicia sp.*					
Poaceae	*Fingerhuthia africana*	Lehm.			LC	Indigenous
Asteraceae	*Flaveria bidentis*	(L.) Kuntze				Not indigenous; Naturalised; Invasive
Apocynaceae	*Fockea angustifolia*	K.Schum.			LC	Indigenous
Asteraceae	*Foveolina burchellii*	(DC.) Magee			LC	Indigenous

Frankeniaceae	*Frankenia pulverulenta*	L.			LC	Indigenous
Iridaceae	*Freesia andersoniae*	L.Bolus			LC	Indigenous; Endemic
Funariaceae	*Funaria hygrometrica*	Hedw.				Indigenous
Funariaceae	*Funaria rottleri*	(Schwagr.) Broth.				Indigenous
Aizoaceae	*Galenia namaensis*	Schinz			LC	Indigenous
Aizoaceae	*Galenia pallens*	(Eckl. & Zeyh.) Walp.			DD	Indigenous; Endemic
Aizoaceae	*Galenia portulacacea*	Fenzl ex Sond.			LC	Indigenous; Endemic
Aizoaceae	*Galenia procumbens*	L.f.			LC	Indigenous; Endemic
Aizoaceae	*Galenia prostrata*	G.Schellenb. & Schltr.			LC	Indigenous; Endemic
Aizoaceae	*Galenia pubescens*	(Eckl. & Zeyh.) Druce			LC	Indigenous; Endemic
Asteraceae	*Galeomma stenolepis*	(S.Moore) Hilliard			LC	Indigenous
Asteraceae	*Gazania jurineifolia*	DC.	sub sp.	jurineifolia	LC	Indigenous; Endemic
Asteraceae	*Gazania krebsiana*	Less.				Indigenous
Asteraceae	*Gazania krebsiana*	Less.	sub sp.	arctotoides	LC	Indigenous
Asteraceae	*Gazania krebsiana*	Less.	sub sp.	krebsiana	LC	Indigenous
Asteraceae	*Geigeria brevifolia*	(DC.) Harv.			LC	Indigenous
Asteraceae	*Geigeria burkei*	Harv.	sub sp.	diffusa	LC	Indigenous
Asteraceae	*Geigeria filifolia*	Mattf.			LC	Indigenous
Asteraceae	*Geigeria obtusifolia*	L.Bolus			LC	Indigenous
Asteraceae	*Geigeria ornativa*	O.Hoffm.	sub sp.	ornativa	LC	Indigenous
Amaryllidaceae	*Gethyllis transkarooica*	D.Mull.-Doblies			LC	Indigenous
Gisekiaceae	*Gisekia africana*	(Lour.) Kuntze	var.	decagyna	LC	Indigenous
Gisekiaceae	*Gisekia africana*	(Lour.) Kuntze	var.	africana	LC	Indigenous
Gisekiaceae	*Gisekia pharnaceoides*	L.	var.	pharnaceoides	LC	Indigenous
Gisekiaceae	*Gisekia pharnaceoides*	L.				Indigenous
Iridaceae	*Gladiolus orchidiflorus*	Andrews			LC	Indigenous
Iridaceae	*Gladiolus permeabilis*	D.Delaroche	sub sp.	edulis	LC	Indigenous
Acanthaceae	*Glossochilus burchellii*	Nees			LC	Indigenous
Asteraceae	*Gnaphalium confine*	Harv.			LC	Indigenous
Apocynaceae	*Gomphocarpus fruticosus*	(L.) W.T.Aiton	sub sp.	fruticosus	LC	Indigenous
Apocynaceae	*Gomphocarpus tomentosus*	Burch.	sub sp.	tomentosus	LC	Indigenous
Scrophulariaceae	*Gomphostigma virgatum*	(L.f.) Baill.			LC	Indigenous
Amaranthaceae	*Gomphrena celosioides*	Mart.				Not indigenous; Naturalised
Malvaceae	*Grewia flava*	DC.			LC	Indigenous
Melianthaceae	*Greyia sutherlandii*	Hook. & Harv.			LC	Indigenous
Neuradaceae	*Grielum humifusum*	Thunb.	var.	humifusum	LC	Indigenous

Celastraceae	*Gymnosporia buxifolia*	(L.) Szyszyl.			LC	Indigenous
Amaryllidaceae	*Haemanthus humilis*	Jacq.	sub sp.	humilis	LC	Indigenous; Endemic
Pedaliaceae	*Harpagophytum procumbens*	Burch. ex Meisn.			LC	Indigenous
Pedaliaceae	*Harpagophytum procumbens*	(Burch.) DC. ex Meisn.	sub sp.	procumbens	NE	Indigenous
Orobanchaceae	*Harveya sp.*					
Scrophulariaceae	*Hebenstretia integrifolia*	L.			LC	Indigenous
Asteraceae	*Helichrysum arenicola*	M.D.Hend.			LC	Indigenous
Asteraceae	*Helichrysum argyrosphaerum*	DC.			LC	Indigenous
Asteraceae	*Helichrysum caespititium*	(DC.) Harv.			LC	Indigenous
Asteraceae	*Helichrysum cerastioides*	DC.	var.	cerastioides	LC	Indigenous
Asteraceae	*Helichrysum dregeanum*	Sond. & Harv.			LC	Indigenous
Asteraceae	*Helichrysum lineare*	DC.			LC	Indigenous
Asteraceae	*Helichrysum lucilioides*	Less.			LC	Indigenous
Asteraceae	*Helichrysum nudifolium*	(L.) Less.	var.	nudifolium	LC	Indigenous
Asteraceae	*Helichrysum paronychioides*	DC.			LC	Indigenous
Asteraceae	*Helichrysum sp.*					
Asteraceae	*Helichrysum zeyheri*	Less.			LC	Indigenous
Brassicaceae	*Heliophila minima*	(Stephens) Marais			LC	Indigenous
Boraginaceae	*Heliotropium ciliatum*	Kaplan			LC	Indigenous
Boraginaceae	*Heliotropium curassavicum*	L.				Not indigenous; Naturalised
Boraginaceae	*Heliotropium lineare*	(A.DC.) Gurke			LC	Indigenous
Boraginaceae	*Heliotropium nelsonii*	C.H.Wright			LC	Indigenous
Poaceae	*Hemarthria altissima*	(Poir.) Stapf & C.E.Hubb.			LC	Indigenous
Malvaceae	*Hermannia bicolor*	Engl. & Dinter			LC	Indigenous
Malvaceae	*Hermannia boraginiflora*	Hook.			LC	Indigenous
Malvaceae	*Hermannia comosa*	Burch. ex DC.			LC	Indigenous
Malvaceae	*Hermannia erodioides*	(Burch. ex DC.) Kuntze			LC	Indigenous
Malvaceae	*Hermannia linearifolia*	Harv.			LC	Indigenous; Endemic
Malvaceae	*Hermannia modesta*	(Ehrenb.) Mast.			LC	Indigenous
Malvaceae	*Hermannia pulchella*	L.f.			LC	Indigenous
Malvaceae	*Hermannia sp.*					
Malvaceae	*Hermannia tomentosa*	(Turcz.) Schinz ex Engl.			LC	Indigenous
Amaranthaceae	*Hermbstaedtia odorata*	(Burch.) T.Cooke	var.	odorata	NE	Indigenous
Caryophyllaceae	*Herniaria erckertii*	F.Herm.	sub sp.	erckertii	LC	Indigenous
Asteraceae	*Hertia ciliata*	(Harv.) Kuntze			LC	Indigenous

Asteraceae	*Hertia pallens*	(DC.) Kuntze			LC	Indigenous
Poaceae	*Heteropogon contortus*	(L.) Roem. & Schult.			LC	Indigenous
Malvaceae	*Hibiscus marlothianus*	K.Schum.			LC	Indigenous; Endemic
Malvaceae	*Hibiscus pusillus*	Thunb.			LC	Indigenous
Asteraceae	*Hirpicium echinus*	Less.			LC	Indigenous
Molluginaceae	*Hypertelis cerviana*	(L.) Thulin				Indigenous
Martyniaceae	*Ibicella lutea*	(Lindl.) Van Eselt.				Not indigenous; Naturalised
Asteraceae	*Ifloga glomerata*	(Harv.) Schltr.			LC	Indigenous
Fabaceae	*Indigastrum niveum*	(Willd. ex Spreng.) Schrire & Callm.				Indigenous
Fabaceae	*Indigofera alternans*	DC.	var.	alternans	LC	Indigenous
Fabaceae	*Indigofera arrecta*	Hochst. ex A.Rich.			LC	Indigenous
Fabaceae	*Indigofera daleoides*	Benth. ex Harv.			LC	Indigenous
Fabaceae	*Indigofera daleoides*	Benth. ex Harv.	var.	daleoides	NE	Indigenous
Fabaceae	*Indigofera filipes*	Benth. ex Harv.			LC	Indigenous
Fabaceae	*Indigofera heterotricha*	DC.			LC	Indigenous
Fabaceae	*Indigofera holubii*	N.E.Br.			LC	Indigenous
Fabaceae	*Indigofera rhytidocarpa*	Benth. ex Harv.	sub sp.	rhytidocarpa	LC	Indigenous
Fabaceae	*Indigofera sessilifolia*	DC.			LC	Indigenous
Fabaceae	*Indigofera sp.*					
Fabaceae	*Indigofera vicioides*	Jaub. & Spach	sub sp.	vicioides	LC	Indigenous
Convolvulaceae	*Ipomoea bolusiana*	Schinz			LC	Indigenous
Convolvulaceae	*Ipomoea obscura*	(L.) Ker Gawl.	var.	obscura	LC	Indigenous
Convolvulaceae	*Ipomoea oenotheroides*	(L.f.) Raf. ex Hallier f.			LC	Indigenous
Fabroniaceae	*Ischyrodon lepturus*	(Taylor) Schelpe				Indigenous
Cyperaceae	*Isolepis sepulcralis*	Steud.			LC	Indigenous
Scrophulariaceae	*Jamesbrittenia albiflora*	(I.Verd.) Hilliard			LC	Indigenous; Endemic
Scrophulariaceae	*Jamesbrittenia atropurpurea*	(Benth.) Hilliard	sub sp.	atropurpurea	LC	Indigenous
Scrophulariaceae	*Jamesbrittenia atropurpurea*	(Benth.) Hilliard				Indigenous
Scrophulariaceae	*Jamesbrittenia integerrima*	(Benth.) Hilliard			LC	Indigenous
Scrophulariaceae	*Jamesbrittenia sp.*					
Oleaceae	*Jasminum angulare*	Vahl			LC	Indigenous
Juncaceae	*Juncus exsertus*	Buchenau			LC	Indigenous
Juncaceae	*Juncus rigidus*	Desf.			LC	Indigenous
Acanthaceae	*Justicia divaricata*	Licht. ex Roem. & Schult.				Indigenous
Acanthaceae	*Justicia orchioides*	L.f.	sub sp.	glabrata	LC	Indigenous; Endemic
Crassulaceae	*Kalanchoe paniculata*	Harv.			LC	Indigenous
Crassulaceae	*Kalanchoe tubiflora*	(Harv.) Raym.-Hamet				Not indigenous; Cultivated; Naturalised; Invasive

Cucurbitaceae	*Kedrostis africana*	(L.) Cogn.			LC	Indigenous
Kewaceae	*Kewa salsoloides*	(Burch.) Christenh.			LC	Indigenous
Asteraceae	*Kleinia longiflora*	DC.			LC	Indigenous
Rubiaceae	*Kohautia caespitosa*	Schnizl.	subsp.	brachyloba	LC	Indigenous
Rubiaceae	*Kohautia cynanchica*	DC.			LC	Indigenous
Cyperaceae	*Kyllinga alba*	Nees			LC	Indigenous
Hyacinthaceae	*Lachenalia karooica*	W.F.Barker ex G.D.Duncan			LC	Indigenous; Endemic
Asteraceae	*Lactuca inermis*	Forssk.			LC	Indigenous
Asteraceae	*Laggera decurrens*	(Vahl) Hepper & J.R.I.Wood			LC	Indigenous
Verbenaceae	*Lantana rugosa*	Thunb.			LC	Indigenous
Iridaceae	*Lapeirousia plicata*	(Jacq.) Diels	subsp.	plicata	LC	Indigenous
Iridaceae	*Lapeirousia plicata*	(Jacq.) Diels	subsp.	foliosa		Indigenous
Boraginaceae	*Lappula heteracantha*	Ledeb.				Not indigenous; Naturalised
Asteraceae	*Lasiopogon glomerulatus*	(Harv.) Hilliard			LC	Indigenous
Thymelaeaceae	*Lasiosiphon polycephalus*	(E.Mey. ex Meisn.) H.Pearson			LC	Indigenous
Asteraceae	*Lasiospermum bipinnatum*	(Thunb.) Druce			LC	Indigenous
Hyacinthaceae	*Ledebouria marginata*	(Baker) Jessop			LC	Indigenous
Hyacinthaceae	*Ledebouria sp.*					
Hyacinthaceae	*Ledebouria undulata*	(Jacq.) Jessop ex Willd.			LC	Indigenous
Lamiaceae	*Leonotis pentadentata*	J.C.Manning & Goldblatt			LC	Indigenous
Brassicaceae	*Lepidium africanum*	(Burm.f.) DC.	subsp.	divaricatum	LC	Indigenous
Brassicaceae	*Lepidium englerianum*	(Muschl.) Al-Shehbaz				Indigenous
Brassicaceae	*Lepidium sp.*					
Fabaceae	*Lessertia affinis*	Burtt Davy			LC	Indigenous; Endemic
Fabaceae	*Lessertia depressa*	Harv.			LC	Indigenous
Fabaceae	*Lessertia frutescens*	(L.) Goldblatt & J.C.Manning	subsp.	frutescens	LC	Indigenous
Fabaceae	*Lessertia pauciflora*	Harv.	var.	pauciflora	LC	Indigenous
Fabaceae	*Lessertia sp.*					
Fabaceae	*Leucaena sp.*					
Limeaceae	*Limeum aethiopicum*	Burm.f.	var.	aethiopicum	NE	Indigenous; Endemic
Limeaceae	*Limeum arenicolum*	G.Schellenb.			LC	Indigenous
Limeaceae	*Limeum argute-carinatum*	Wawra ex Wawra & Peyr.	var.	argute-carinatum	LC	Indigenous
Limeaceae	*Limeum argute-carinatum*	Wawra ex Wawra & Peyr.	var.	kwebense		Indigenous
Limeaceae	*Limeum fenestratum*	(Fenzl) Heimerl	var.	fenestratum	LC	Indigenous
Limeaceae	*Limeum pterocarpum*	(J.Gay) Heimerl				Indigenous
Limeaceae	*Limeum sulcatum*	(Klotzsch) Hutch.				Indigenous

Limeaceae	*Limeum sulcatum*	(Klotzsch) Hutch.	var.	sulcatum	LC	Indigenous
Limeaceae	*Limeum viscosum*	(J.Gay) Fenzl	sub sp.	viscosum	NE	Indigenous
Limeaceae	*Limeum viscosum*	(J.Gay) Fenzl	sub sp.	transvaalense	LC	Indigenous; Endemic
Limeaceae	*Limeum viscosum*	(J.Gay) Fenzl				Indigenous
Limeaceae	*Limeum viscosum*	(J.Gay) Fenzl	sub sp.	viscosum	NE	Indigenous
Scrophulariaceae	*Limosella longiflora*	Kuntze			LC	Indigenous
Scrophulariaceae	*Limosella maior*	Diels			LC	Indigenous
Verbenaceae	*Lippia scaberrima*	Sond.			LC	Indigenous
Fabaceae	*Listia heterophylla*	E.Mey.			LC	Indigenous
Fabaceae	*Listia marlothii*	(Engl.) B.-E.van Wyk & Boatwr.			LC	Indigenous
Boraginaceae	*Lithospermum cinereum*	A.DC.			LC	Indigenous
Asteraceae	*Litogyne gariepina*	(DC.) Anderb.			LC	Indigenous
Lobeliaceae	*Lobelia dregeana*	(C.Presl) A.DC.			LC	Indigenous
Lobeliaceae	*Lobelia thermalis*	Thunb.			LC	Indigenous
Lophiocarpaceae	*Lophiocarpus polystachyus*	Turcz.			LC	Indigenous
Solanaceae	*Lycium arenicola*	Miers			LC	Indigenous
Solanaceae	*Lycium cinereum*	Thunb.			LC	Indigenous
Solanaceae	*Lycium ferocissimum*	Miers			LC	Indigenous
Solanaceae	*Lycium hirsutum*	Dunal			LC	Indigenous
Solanaceae	*Lycium horridum*	Thunb.			LC	Indigenous
Solanaceae	*Lycium pilifolium*	C.H.Wright			LC	Indigenous
Solanaceae	*Lycium pumilum*	Dammer			LC	Indigenous
Solanaceae	*Lycium villosum*	Schinz			LC	Indigenous
Malvaceae	*Malva parviflora*	L.	var.	parviflora		Not indigenous; Naturalised
Malvaceae	*Malva pusilla*	Sm.				Not indigenous; Naturalised
Marsileaceae	*Marsilea sp.*					
Hyacinthaceae	*Massonia jasminiflora*	Burch. ex Baker			LC	Indigenous
Fabaceae	*Medicago laciniata*	(L.) Mill.	var.	laciniata	NE	Not indigenous; Naturalised
Fabaceae	*Medicago polymorpha*	L.			NE	Not indigenous; Naturalised; Invasive
Malvaceae	*Melhania prostrata*	DC.			LC	Indigenous
Malvaceae	*Melhania virescens*	(K.Schum.) K.Schum.			LC	Indigenous
Poaceae	*Melinis repens*	(Willd.) Zizka	sub sp.	repens	LC	Indigenous
Poaceae	*Melinis repens*	(Willd.) Zizka	sub sp.	grandiflora	LC	Indigenous
Fabaceae	*Melolobium calycinum*	Benth.			LC	Indigenous
Fabaceae	*Melolobium candicans*	(E.Mey.) Eckl. & Zeyh.			LC	Indigenous
Fabaceae	*Melolobium canescens*	Benth.			LC	Indigenous
Fabaceae	*Melolobium microphyllum*	(L.f.) Eckl. & Zeyh.			LC	Indigenous

Oleaceae	*Menodora africana*	Hook.			LC	Indigenous
Lamiaceae	*Mentha longifolia*	(L.) Huds.	sub sp.	capensis	LC	Indigenous
Convolvulaceae	*Merremia verecunda*	Rendle			LC	Indigenous
Aizoaceae	*Mesembryanthemum articulatum*	Thunb.				Indigenous
Aizoaceae	*Mesembryanthemum cordifolium*	L.f.				Indigenous; Endemic
Aizoaceae	*Mesembryanthemum coriarium*	Burch. ex N.E.Br.				Indigenous
Aizoaceae	*Mesembryanthemum granulicaule*	Haw.				Indigenous
Asteraceae	*Mesogramma apiifolium*	DC.			LC	Indigenous
Aizoaceae	*Mestoklema arboriforme*	(Burch.) N.E.Br. ex Glen			LC	Indigenous; Endemic
Pottiaceae	*Microbryum rufochaete*	(Magill) R.H.Zander				Indigenous; Endemic
Poaceae	*Microchloa kunthii*	Desv.			LC	Indigenous
Apocynaceae	*Microloma armatum*	(Thunb.) Schltr.	var.	burchellii	LC	Indigenous
Apocynaceae	*Microloma armatum*	(Thunb.) Schltr.	var.	armatum	LC	Indigenous
Phrymaceae	*Mimulus gracilis*	R.Br.			LC	Indigenous
Cucurbitaceae	*Momordica balsamina*	L.			LC	Indigenous
Geraniaceae	*Monsonia angustifolia*	E.Mey. ex A.Rich.			LC	Indigenous
Geraniaceae	*Monsonia burkeana*	Planch. ex Harv.			LC	Indigenous
Iridaceae	*Moraea falcifolia*	Klatt			LC	Indigenous
Iridaceae	*Moraea pallida*	(Baker) Goldblatt			LC	Indigenous
Iridaceae	*Moraea polystachya*	(Thunb.) Ker Gawl.			LC	Indigenous
Haloragaceae	*Myriophyllum spicatum*	L.				Not indigenous; Cultivated; Naturalised; Invasive
Scrophulariaceae	*Nemesia fruticans*	(Thunb.) Benth.			LC	Indigenous
Scrophulariaceae	*Nemesia lilacina*	N.E.Br.			LC	Indigenous
Rubiaceae	*Nenax microphylla*	(Sond.) T.M.Salter			LC	Indigenous
Amaryllidaceae	*Nerine hesseoides*	L.Bolus			LC	Indigenous; Endemic
Amaryllidaceae	*Nerine laticoma*	(Ker Gawl.) T.Durand & Schinz			LC	Indigenous
Neuradaceae	*Neuradopsis bechuanensis*	Bremek. & Schweick.			LC	Indigenous
Solanaceae	*Nicotiana glauca*	Graham				Not indigenous; Naturalised; Invasive
Asteraceae	*Nidorella resedifolia*	DC.				Indigenous
Asteraceae	*Nidorella resedifolia*	DC.	sub sp.	resedifolia	LC	Indigenous
Asteraceae	*Nolletia chrysocomoides*	(Desf.) Cass. ex Less.			LC	Indigenous
Asteraceae	*Nolletia ciliaris*	(DC.) Steetz			LC	Indigenous
Alliaceae	*Nothoscordum borbonicum*	Kunth			NE	Not indigenous; Naturalised; Invasive
Stilbaceae	*Nuxia gracilis*	Engl.			LC	Indigenous; Endemic
Stilbaceae	*Nuxia sp.*					

Lamiaceae	*Ocimum americanum*	L.	var.	americanum	LC	Indigenous
Asteraceae	*Oedera humilis*	(Less.) N.G.Bergh				Indigenous
Onagraceae	*Oenothera indecora*	Cambess.				Not indigenous; Naturalised
Oleaceae	*Olea europaea*	L.	sub sp.	cuspidata		Indigenous
Resedaceae	*Oligomeris dipetala*	(Aiton) Turcz.	var.	dipetala	LC	Indigenous
Asteraceae	*Oncosiphon pilulifer*	(L.f.) Kallersjo			LC	Indigenous
Apocynaceae	*Orbea lutea*	(N.E.Br.) Bruyns	sub sp.	lutea	LC	Indigenous
Apocynaceae	*Orbea verrucosa*	(Masson) L.C.Leach			LC	Indigenous; Endemic
Hyacinthaceae	*Ornithogalum flexuosum*	(Thunb.) U.Mull.-Doblies & D.Mull.-Doblies			LC	Indigenous
Colchicaceae	*Ornithoglossum dinteri*	K.Krause			LC	Indigenous
Colchicaceae	*Ornithoglossum sp.*					
Colchicaceae	*Ornithoglossum vulgare*	B.Nord.			LC	Indigenous
Poaceae	*Oropetium capense*	Stapf			LC	Indigenous
Apocynaceae	*Orthanthera jasminiflora*	(Decne.) Schinz			LC	Indigenous
Asteraceae	*Osteospermum leptolobum*	(Harv.) Norl.			LC	Indigenous; Endemic
Asteraceae	*Osteospermum microphyllum*	DC.			LC	Indigenous
Asteraceae	*Osteospermum muricatum*	E.Mey. ex DC.	sub sp.	muricatum	LC	Indigenous
Asteraceae	*Osteospermum scariosum*	DC.	var.	scariosum	NE	Indigenous
Asteraceae	*Osteospermum sp.*					
Asteraceae	*Osteospermum spinescens*	Thunb.			LC	Indigenous
Asteraceae	*Othonna auriculifolia*	Licht. ex Less.			LC	Indigenous; Endemic
Fabaceae	*Otoptera burchellii*	DC.			LC	Indigenous
Oxalidaceae	*Oxalis corniculata*	L.				Not indigenous; Naturalised; Invasive
Oxalidaceae	*Oxalis depressa*	Eckl. & Zeyh.			LC	Indigenous
Oxalidaceae	*Oxalis pes-caprae*	L.	var.	pes-caprae	LC	Indigenous
Oxalidaceae	*Oxalis setosa*	E.Mey. ex Sond.			DD	Indigenous
Polygonaceae	*Oxygonum alatum*	Burch.	var.	alatum	LC	Indigenous
Poaceae	*Panicum arcurameum*	Stapf			LC	Indigenous
Poaceae	*Panicum coloratum*	L.			LC	Indigenous
Poaceae	*Panicum schinzii*	Hack.			LC	Indigenous
Poaceae	*Panicum sp.*					
Poaceae	*Panicum stapfianum*	Fourc.			LC	Indigenous
Malvaceae	*Pavonia burchellii*	(DC.) R.A.Dyer			LC	Indigenous
Asteraceae	*Pegolettia retrofracta*	(Thunb.) Kies			LC	Indigenous
Geraniaceae	*Pelargonium aridum*	R.A.Dyer			LC	Indigenous
Geraniaceae	*Pelargonium malacoides*	R.Knuth				Indigenous

Geraniaceae	*Pelargonium minimum*	(Cav.) Willd.			LC	Indigenous
Scrophulariaceae	*Peliostomum leucorrhizum*	E.Mey. ex Benth.			LC	Indigenous
Scrophulariaceae	*Peliostomum origanoides*	E.Mey. ex Benth.			LC	Indigenous; Endemic
Pteridaceae	*Pellaea calomelanos*	(Sw.) Link	var.	calomelanos	LC	Indigenous
Apocynaceae	*Pentarrhinum insipidum*	E.Mey.			LC	Indigenous
Asteraceae	*Pentzia argentea*	Hutch.			LC	Indigenous
Asteraceae	*Pentzia calcarea*	Kies			LC	Indigenous
Asteraceae	*Pentzia globosa*	Less.			LC	Indigenous
Asteraceae	*Pentzia lanata*	Hutch.			LC	Indigenous
Asteraceae	*Pentzia quinquefida*	(Thunb.) Less.			LC	Indigenous; Endemic
Asteraceae	*Pentzia viridis*	Kies			LC	Indigenous; Endemic
Polygonaceae	*Persicaria hystricula*	(J.Schust.) Sojak			LC	Indigenous
Nyctaginaceae	*Phaeoptilum spinosum*	Radlk.			LC	Indigenous
Poaceae	*Phalaris minor*	Retz.			NE	Not indigenous; Naturalised
Molluginaceae	*Pharnaceum thunbergii*	Adamson			LC	Indigenous; Endemic
Poaceae	*Phragmites australis*	(Cav.) Steud.			LC	Indigenous
Phyllanthaceae	*Phyllanthus maderaspatensis*	L.			LC	Indigenous
Phyllanthaceae	*Phyllanthus parvulus*	Sond.	var.	parvulus	LC	Indigenous
Apocynaceae	*Piaranthus decipiens*	(N.E.Br.) Bruyns			LC	Indigenous
Aytoniaceae	*Plagiochasma rupestre*	(J.R.Forst. & G.Forst.) Steph.	var.	rupestre		Indigenous
Aizoaceae	*Plinthus karooicus*	I.Verd.			LC	Indigenous
Aizoaceae	*Plinthus sericeus*	Pax			LC	Indigenous
Poaceae	*Poa annua*	L.			NE	Not indigenous; Naturalised
Poaceae	*Pogonarthria squarrosa*	(Roem. & Schult.) Pilg.			LC	Indigenous
Caryophyllaceae	*Pollichia campestris*	Aiton			LC	Indigenous
Polygalaceae	*Polygala hottentotta*	C.Presl			LC	Indigenous
Polygalaceae	*Polygala leptophylla*	Burch.	var.	leptophylla	LC	Indigenous
Polygalaceae	*Polygala seminuda*	Harv.			LC	Indigenous
Polygonaceae	*Polygonum aviculare*	L.				Not indigenous; Naturalised
Polygonaceae	*Polygonum plebeium*	R.Br.			LC	Indigenous
Poaceae	*Polypogon monspeliensis*	(L.) Desf.			NE	Not indigenous; Naturalised
Portulacaceae	*Portulaca kermesina*	N.E.Br.			LC	Indigenous
Portulacaceae	*Portulaca quadrifida*	L.			LC	Indigenous
Portulacaceae	*Portulaca sp.*					
Potamogetonaceae	*Potamogeton crispus*	L.			LC	Indigenous

Potamogetonaceae	*Potamogeton pectinatus*	L.			LC	Indigenous
Rosaceae	*Potentilla supina*	L.				Indigenous
Fabaceae	*Prosopis glandulosa*	Torr.	var.	torreyana	NE	Not indigenous; Naturalised; Invasive
Fabaceae	*Prosopis glandulosa*	Torr.	var.	glandulosa	NE	Not indigenous; Naturalised
Fabaceae	*Prosopis pubescens*	Benth.			NE	Not indigenous; Naturalised
Fabaceae	*Prosopis velutina*	Wooton			NE	Not indigenous; Naturalised; Invasive
Asteraceae	*Pseudognaphalium luteoalbum*	(L.) Hilliard & B.L.Burtt			LC	Cryptogenic
Cyperaceae	*Pseudoschoenus inanis*	(Thunb.) Oteng-Yeb.			LC	Indigenous
Pedaliaceae	*Pterodiscus speciosus*	Hook.			LC	Indigenous
Asteraceae	*Pteronia glauca*	Thunb.			LC	Indigenous
Fabaceae	*Ptycholobium biflorum*	(E.Mey.) Brummitt	subsp.	biflorum	LC	Indigenous
Ptychomitriaceae	*Ptychomitrium crispatum*	(Hedw.) A.Jaeger				Indigenous
Poaceae	*Puccinellia acroxantha*	C.A.Sm. & C.E.Hubb.			LC	Indigenous
Amaranthaceae	*Pupalia lappacea*	(L.) A.Juss.				Indigenous
Amaranthaceae	*Pupalia lappacea*	(L.) A.Juss.	var.	lappacea	LC	Indigenous
Celastraceae	*Putterlickia saxatilis*	(Burch.) Jordaan			LC	Indigenous; Endemic
Ranunculaceae	*Ranunculus multifidus*	Forssk.			LC	Indigenous
Ranunculaceae	*Ranunculus trichophyllus*	Chaix			LC	Indigenous
Apocynaceae	*Raphionacme velutina*	Schltr.			LC	Indigenous
Brassicaceae	*Rapistrum rugosum*	(L.) All.				Not indigenous; Naturalised; Invasive
Bignoniaceae	*Rhigozum obovatum*	Burch.			LC	Indigenous
Bignoniaceae	*Rhigozum trichotomum*	Burch.			LC	Indigenous
Fabaceae	*Rhynchosia confusa*	Burtt Davy			NE	Indigenous
Fabaceae	*Rhynchosia holosericea*	Schinz			LC	Indigenous
Fabaceae	*Rhynchosia minima*	(L.) DC.	var.	prostrata	NE	Indigenous
Fabaceae	*Rhynchosia sp.*					
Fabaceae	*Rhynchosia totta*	(Thunb.) DC.	var.	rigidula		Indigenous
Ricciaceae	*Riccia albolimbata*	S.W.Arnell				Indigenous
Ricciaceae	*Riccia cavernosa*	Hoffm.				Indigenous
Ricciaceae	*Riccia simii*	Perold				Indigenous
Apocynaceae	*Riocreuxia polyantha*	Schltr.			LC	Indigenous
Zygophyllaceae	*Roepera incrustata*	(Sond.) Beier & Thulin				Indigenous
Zygophyllaceae	*Roepera pubescens*	(Schinz) Beier & Thulin				Indigenous
Brassicaceae	*Rorippa fluviatilis*	(E.Mey. ex Sond.) R.A.Dyer	var.	caledonica	LC	Indigenous
Rubiaceae	*Rubia petiolaris*	DC.			LC	Indigenous
Aizoaceae	*Ruschia griquensis*	(L.Bolus) Schwantes			LC	Indigenous; Endemic

Aizoaceae	*Ruschia sp.*					
Salicaceae	*Salix babylonica*	L.	var.	babylonica		Not indigenous; Naturalised
Salicaceae	*Salix mucronata*	Thunb.	subsp.	mucronata	LC	Indigenous
Amaranthaceae	*Salsola aphylla*	L.f.			LC	Indigenous
Amaranthaceae	*Salsola calluna*	Drege ex C.H.Wright			LC	Indigenous; Endemic
Amaranthaceae	*Salsola denudata*	Botsch.			LC	Indigenous
Amaranthaceae	*Salsola exalata*	Botsch.			LC	Indigenous; Endemic
Amaranthaceae	*Salsola geminiflora*	Fenzl ex C.H.Wright			LC	Indigenous; Endemic
Amaranthaceae	*Salsola glabrescens*	Burtt Davy			LC	Indigenous
Amaranthaceae	*Salsola kali*	L.				Not indigenous; Naturalised; Invasive
Amaranthaceae	*Salsola rabieana*	I.Verd.			LC	Indigenous
Amaranthaceae	*Salsola tuberculata*	(Moq.) Fenzl			LC	Indigenous
Lamiaceae	*Salvia disermas*	L.			LC	Indigenous
Lamiaceae	*Salvia namaensis*	Schinz			LC	Indigenous
Lamiaceae	*Salvia stenophylla*	Burch. ex Benth.				Indigenous
Lamiaceae	*Salvia verbenaca*	L.			LC	Not indigenous; Naturalised; Invasive
Dipsacaceae	*Scabiosa columbaria*	L.			LC	Indigenous
Amaryllidaceae	*Scadoxus puniceus*	(L.) Friis & Nordal			LC	Indigenous
Anacardiaceae	*Schinus molle*	L.			NE	Not indigenous; Naturalised; Invasive
Poaceae	*Schismus barbatus*	(Loefl. ex L.) Thell.			LC	Indigenous
Hyacinthaceae	*Schizocarphus nervosus*	(Burch.) Van der Merwe			LC	Indigenous
Asteraceae	*Schkuhria pinnata*	(Lam.) Kuntze ex Thell.				Not indigenous; Naturalised
Poaceae	*Schmidtia kalahariensis*	Stent			LC	Indigenous
Poaceae	*Schmidtia pappophoroides*	Steud.			LC	Indigenous
Anacardiaceae	*Searsia ciliata*	(Licht. ex Schult.) A.J.Mill.			LC	Indigenous
Anacardiaceae	*Searsia lancea*	(L.f.) F.A.Barkley			LC	Indigenous
Anacardiaceae	*Searsia pyroides*	(Burch.) Moffett	var.	pyroides	LC	Indigenous
Anacardiaceae	*Searsia tridactyla*	(Burch.) Moffett			LC	Indigenous; Endemic
Gentianaceae	*Sebaea exigua*	(Oliv.) Schinz			LC	Indigenous
Gentianaceae	*Sebaea pentandra*	E.Mey.	var.	pentandra	LC	Indigenous
Euphorbiaceae	*Seidelia triandra*	(E.Mey.) Pax			LC	Indigenous
Scrophulariaceae	*Selago albomarginata*	Hilliard			LC	Indigenous
Scrophulariaceae	*Selago densiflora*	Rolfe			LC	Indigenous
Scrophulariaceae	*Selago geniculata*	L.f.			LC	Indigenous; Endemic

Scrophulariaceae	*Selago mixta*	Hilliard			LC	Indigenous; Endemic
Scrophulariaceae	*Selago saxatilis*	E.Mey.			LC	Indigenous
Scrophulariaceae	*Selago sp.*					
Scrophulariaceae	*Selago welwitschii*	Rolfe	var.	australis	LC	Indigenous
Asteraceae	*Senecio burchellii*	DC.			LC	Indigenous; Endemic
Asteraceae	*Senecio cinerascens*	Aiton			LC	Indigenous
Asteraceae	*Senecio consanguineus*	DC.			LC	Indigenous
Asteraceae	*Senecio glutinosus*	Thunb.			LC	Indigenous
Asteraceae	*Senecio inaequidens*	DC.			LC	Indigenous
Asteraceae	*Senecio intricatus*	S.Moore			LC	Indigenous; Endemic
Asteraceae	*Senecio reptans*	Turcz.			LC	Indigenous; Endemic
Asteraceae	*Senecio windhoekensis*	Merxm.			LC	Indigenous
Fabaceae	*Senegalia mellifera*	(Vahl) Seigler & Ebinger	subsp.	detinens	LC	Indigenous
Fabaceae	*Senna italica*	Mill.	subsp.	arachoides	LC	Indigenous
Amaranthaceae	*Sericorema remotiflora*	(Hook.f.) Lopr.			LC	Indigenous
Pedaliaceae	*Sesamum capense*	Burm.f.			LC	Indigenous
Fabaceae	*Sesbania notialis*	J.B.Gillett			LC	Indigenous; Endemic
Poaceae	*Setaria pumila*	(Poir.) Roem. & Schult.			LC	Indigenous
Poaceae	*Setaria sp.*					
Poaceae	*Setaria verticillata*	(L.) P.Beauv.			LC	Indigenous
Malvaceae	*Sida chrysantha*	Ulbr.			LC	Indigenous
Malvaceae	*Sida sp.*					
Malvaceae	*Sida ternata*	L.f.			LC	Indigenous
Brassicaceae	*Sisymbrium burchellii*	DC.	var.	burchellii	LC	Indigenous
Solanaceae	*Solanum capense*	L.			LC	Indigenous
Solanaceae	*Solanum lichtensteinii*	Willd.			LC	Indigenous
Solanaceae	*Solanum nigrum*	L.				Not indigenous; Naturalised
Solanaceae	*Solanum retroflexum*	Dunal			LC	Indigenous
Solanaceae	*Solanum tomentosum*	L.				Indigenous
Asteraceae	*Sonchus oleraceus*	L.				Not indigenous; Naturalised; Invasive
Poaceae	*Sorghum halepense*	(L.) Pers.			NE	Not indigenous; Naturalised; Invasive
Caryophyllaceae	*Spergularia rubra*	(L.) J.Presl & C.Presl				Not indigenous; Naturalised
Malvaceae	*Sphaeralcea bonariensis*	(Cav.) Griseb.				Not indigenous; Naturalised
Poaceae	*Sporobolus albicans*	(Nees ex Trin.) Nees			LC	Indigenous
Poaceae	*Sporobolus coromandelianus*	(Retz.) Kunth			LC	Indigenous
Poaceae	*Sporobolus discosporus*	Nees			LC	Indigenous
Poaceae	*Sporobolus fimbriatus*	(Trin.) Nees			LC	Indigenous

Poaceae	*Sporobolus ioclados*	(Trin.) Nees			LC	Indigenous
Poaceae	*Sporobolus ludwigii*	Hochst.			LC	Indigenous
Poaceae	*Sporobolus sp.*					
Lamiaceae	*Stachys hyssopoides*	Burch. ex Benth.			LC	Indigenous
Lamiaceae	*Stachys spathulata*	Burch. ex Benth.			LC	Indigenous
Apocynaceae	*Stapelia gettliffei*	R.Pott			LC	Indigenous
Apocynaceae	*Stapelia gigantea*	N.E.Br.			LC	Indigenous
Apocynaceae	*Stapelia leendertziae*	N.E.Br.			LC	Indigenous
Apocynaceae	*Stenostelma capense*	Schltr.			LC	Indigenous
Poaceae	*Stipagrostis brevifolia*	(Nees) De Winter			LC	Indigenous
Poaceae	*Stipagrostis hochstetteriana*	(Beck ex Hack.) De Winter	var.	secalina	LC	Indigenous
Poaceae	*Stipagrostis namaquensis*	(Nees) De Winter			LC	Indigenous
Poaceae	*Stipagrostis obtusa*	(Delile) Nees			LC	Indigenous
Poaceae	*Stipagrostis uniplumis*	(Licht.) De Winter	var.	uniplumis	LC	Indigenous
Poaceae	*Stipagrostis uniplumis*	(Licht.) De Winter	var.	neesii	LC	Indigenous
Orobanchaceae	*Striga bilabiata*	(Thunb.) Kuntze	sub sp.	bilabiata	LC	Indigenous
Amaranthaceae	*Suaeda fruticosa*	(L.) Forssk. ex J.F.Gmel.			LC	Indigenous
Asteraceae	*Symphyotrichum squamatum*	(Spreng.) G.L.Nesom				Not indigenous; Naturalised; Invasive
Talinaceae	*Talinum arnotii*	Hook.f.			LC	Indigenous
Talinaceae	*Talinum caffrum*	(Thunb.) Eckl. & Zeyh.			LC	Indigenous
Talinaceae	*Talinum crispatulum*	Dinter & Poelln.			LC	Indigenous
Tamaricaceae	*Tamarix ramosissima*	Ledeb.				Not indigenous; Naturalised; Invasive
Asteraceae	*Tarchonanthus camphoratus*	L.			LC	Indigenous
Asteraceae	*Tarchonanthus obovatus*	DC.			LC	Indigenous; Endemic
Targioniaceae	*Targionia hypophylla*	L.				Indigenous
Fabaceae	*Tephrosia burchellii*	Burtt Davy			LC	Indigenous
Fabaceae	*Tephrosia dregeana*	E.Mey.	var.	dregeana	LC	Indigenous
Fabaceae	*Tephrosia dregeana*	E.Mey.				Indigenous
Fabaceae	*Tephrosia longipes*	Meisn.				Indigenous
Zygophyllaceae	*Tetraena microcarpa*	(Licht. ex Cham.) Beier & Thulin				Indigenous
Zygophyllaceae	*Tetraena simplex*	(L.) Beier & Thulin				Indigenous
Aizoaceae	*Tetragonia arbuscula*	Fenzl			LC	Indigenous
Ranunculaceae	*Thalictrum minus*	L.			LC	Indigenous
Poaceae	*Themeda triandra*	Forssk.			LC	Indigenous
Santalaceae	*Thesium hystricoides*	A.W.Hill			LC	Indigenous
Santalaceae	*Thesium hystrix*	A.W.Hill			LC	Indigenous

Santalaceae	*Thesium resedoides*	A.W.Hill			LC	Indigenous
Santalaceae	*Thesium zeyheri*	A.DC.			LC	Indigenous
Aizoaceae	*Titanopsis calcarea*	(Marloth) Schwantes			LC	Indigenous; Endemic
Asphodelaceae	*Trachyandra burkei*	(Baker) Oberm.			LC	Indigenous
Asphodelaceae	*Trachyandra laxa*	(N.E.Br.) Oberm.	var.	rigida	LC	Indigenous
Asphodelaceae	*Trachyandra laxa*	(N.E.Br.) Oberm.	var.	laxa	LC	Indigenous
Asphodelaceae	*Trachyandra saltii*	(Baker) Oberm.	var.	saltii	LC	Indigenous
Asteraceae	*Tragopogon dubius*	Scop.				Not indigenous; Naturalised
Poaceae	*Tragus berteronianus*	Schult.			LC	Indigenous
Poaceae	*Tragus koelerioides*	Asch.			LC	Indigenous
Poaceae	*Tragus racemosus*	(L.) All.			LC	Indigenous
Aizoaceae	*Trianthema parvifolia*	E.Mey. ex Sond.	var.	parvifolia	LC	Indigenous
Poaceae	*Tribolium sp.*					
Poaceae	*Tribolium tenellum*	(Nees) Verboom & H.P.Linder			LC	Indigenous
Zygophyllaceae	*Tribulus terrestris*	L.			LC	Indigenous
Zygophyllaceae	*Tribulus zeyheri*	Sond.	sub sp.	zeyheri	LC	Indigenous
Boraginaceae	*Trichodesma angustifolium*	Harv.	sub sp.	angustifolium	LC	Indigenous
Aizoaceae	*Trichodiadema pomeridianum*	L.Bolus			LC	Indigenous
Poaceae	*Tricholaena monachne*	(Trin.) Stapf & C.E.Hubb.			LC	Indigenous
Poaceae	*Trichoneura grandiglumis*	(Nees) Ekman			LC	Indigenous
Pottiaceae	*Trichostomum brachydontium*	Bruch				Indigenous
Apocynaceae	*Tridentea gemmiflora*	(Masson) Haw.			LC	Indigenous
Poaceae	*Triraphis andropogonoides*	(Steud.) E.Phillips			LC	Indigenous
Poaceae	*Triraphis purpurea*	Hack.			LC	Indigenous
Cucurbitaceae	*Trochomeria debilis*	(Sond.) Hook.f.			LC	Indigenous
Asteraceae	*Troglophyton capillaceum*	(Thunb.) Hilliard & B.L.Burtt	sub sp.	capillaceum	LC	Indigenous
Alliaceae	*Tulbaghia leucantha*	Baker			LC	Indigenous
Poaceae	*Urochloa panicoides*	P.Beauv.			LC	Indigenous
Fabaceae	*Vachellia erioloba*	(E.Mey.) P.J.H.Hurter			LC	Indigenous
Fabaceae	*Vachellia farnesiana*	(L.) Wight & Arn.				Not indigenous; Naturalised
Fabaceae	*Vachellia grandicornuta*	(Gerstner) Seigler & Ebinger			LC	Indigenous
Fabaceae	*Vachellia hebeclada*	(DC.) Kyal. & Boatwr.	sub sp.	hebeclada	LC	Indigenous
Fabaceae	*Vachellia karroo*	(Hayne) Banfi & Galasso			LC	Indigenous
Fabaceae	*Vachellia tortilis*	(Forssk.) Galasso & Banfi	sub sp.	heteracantha	LC	Indigenous
Vahliaceae	*Vahlia capensis*	(L.f.) Thunb.	sub sp.	vulgaris	NE	Indigenous
Vahliaceae	*Vahlia capensis*	(L.f.) Thunb.	sub sp.	capensis	LC	Indigenous

Verbenaceae	*Verbena officinalis*	L.				Not indigenous; Naturalised
Plantaginaceae	*Veronica anagallis-aquatica*	L.			LC	Indigenous
Santalaceae	*Viscum rotundifolium*	L.f.			LC	Indigenous
Pottiaceae	*Vrolijkheidia peraristata*	(Mull.Hal.) R.H.Zander & Hedd.				Indigenous
Campanulaceae	*Wahlenbergia androsacea*	A.DC.			LC	Indigenous
Campanulaceae	*Wahlenbergia denticulata*	(Burch.) A.DC.	var.	transvaalensis	LC	Indigenous; Endemic
Campanulaceae	*Wahlenbergia denticulata*	(Burch.) A.DC.	var.	denticulata	LC	Indigenous
Campanulaceae	*Wahlenbergia meyeri*	A.DC.			LC	Indigenous; Endemic
Campanulaceae	*Wahlenbergia nodosa*	(H.Buek) Lammers			LC	Indigenous; Endemic
Campanulaceae	*Wahlenbergia sp.*					
Asteraceae	*Xanthium sp.*					
Asteraceae	*Xanthium spinosum*	L.				Not indigenous; Naturalised; Invasive
Asteraceae	*Xanthium strumarium*	L.				Not indigenous; Naturalised; Invasive
Apocynaceae	*Xysmalobium undulatum*	(L.) W.T.Aiton	var.	ensifolium	LC	Indigenous
Scrophulariaceae	*Zaluzianskya venusta*	Hilliard			LC	Indigenous; Endemic
Potamogetonaceae	*Zannichellia palustris*	L.			LC	Indigenous
Cucurbitaceae	*Zehneria sp.*					
Asteraceae	*Zinnia peruviana*	(L.) L.				Not indigenous; Naturalised; Invasive
Rhamnaceae	*Ziziphus mucronata*	Willd.	subsp.	mucronata	LC	Indigenous

8.2 Appendix B – Amphibian species expected to occur in the project area

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	IUCN (2021)
Amietia delalandii	Delalande's River Frog	LC	LC
Cacosternum boettgeri	Common Caco	LC	LC
Kassina senegalensis	Bubbling Kassina	LC	LC
Poyntonophrynus vertebralis	Southern Pygmy Toad	LC	LC
Pyxicephalus adspersus	Giant Bull Frog	LC	LC
Sclerophrys capensis	Raucous Toad	LC	LC
Sclerophrys gutturalis	Guttural Toad	LC	LC
Sclerophrys poweri	Power's Toad	LC	LC
Tomopterna cryptotis	Tremelo Sand Frog	LC	LC
Tomopterna tandyi	Tandy's Sand Frog	LC	LC
Xenopus laevis	Common Platanna	LC	LC

8.3 Appendix C – Reptile species expected to occur in the project area

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	Regional (SANBI, 2016)
Afroedura nivaria	Drakensberg Flat Gecko	LC	LC
Agama aculeata aculeata	Common Ground Agama	LC	LC
Agama aculeata distanti	Distant's Ground Agama	LC	LC
Agama atra	Southern Ground Agama	LC	LC
Aparallactus capensis	Black-headed Centipede-eater	LC	LC
Atractaspis bibronii	Bibron's Stiletto Snake	LC	LC
Bitis arietans arietans	Puff Adder	LC	LC
Boaedon capensis	Brown House Snake	LC	LC
Chamaeleo dilepis	Common Flap-neck Chameleon	LC	LC
Chondrodactylus bibronii	Bibron's Gecko	LC	LC
Crotaphopeltis hotamboeia	Red-lipped Snake	LC	LC
Dasypeltis scabra	Rhombic Egg-eater	LC	LC
Dispholidus typus	Boomslang	LC	LC
Elapsoidea sundevallii media	Highveld Garter Snake	LC	LC
Homopus femoralis	Greater Padloper	LC	LC
Karusasaurus polyzonus	Karoo Girdled Lizard	LC	LC
Lamprophis aurora	Aurora House Snake	LC	LC
Leptotyphlops scutifrons scutifrons	Peters' Thread Snake	LC	LC
Lycodonomorphus rufulus	Brown Water Snake	LC	LC
Lycophidion capense capense	Cape Wolf Snake	LC	LC
Lygodactylus capensis	Common Dwarf Gecko	LC	LC
Meroles squamulosus	Common Rough-scaled Lizard	LC	LC
Monopeltis capensis	Cape Worm Lizard	LC	LC
Monopeltis infuscata	Dusky Worm Lizard	LC	LC
Naja nivea	Cape Cobra	LC	LC
Nucras holubi	Holub's Sandveld Lizard	LC	LC
Nucras intertexta	Spotted Sandveld Lizard	LC	LC
Pachydactylus capensis	Cape Gecko	LC	LC
Pachydactylus mariquensis	Marico Gecko	LC	LC
Panaspis wahlbergii	Wahlberg's Snake-eyed Skink	LC	LC
Pedioplanis lineoocellata lineoocellata	Spotted Sand Lizard	LC	LC
Pedioplanis namaquensis	Namaqua Sand Lizard	LC	LC
Pelomedusa galeata	South African Marsh Terrapin	LC	LC
Philothamnus semivariegatus	Spotted Bush Snake	LC	LC
Prosymna bivittata	Two-striped Shovel-snout	LC	LC
Psammobates oculifer	Serrated Tent Tortoise	LC	LC

Psammophis leightoni	Cape Sand Snake	LC	LC
Psammophis notostictus	Karoo Sand Snake	LC	LC
Psammophylax tritaeniatus	Striped Skaapsteker	LC	LC
Pseudaspis cana	Mole Snake	LC	LC
Ptenopus garrulus garrulus	Common Barking Gecko	LC	LC
Rhinotyphlops lalandei	Delalande's Beaked Blind Snake	LC	LC
Stigmochelys pardalis	Leopard Tortoise	LC	LC
Trachylepis capensis	Cape Skink	LC	LC
Trachylepis punctatissima	Speckled Rock Skink	LC	LC
Trachylepis spilogaster	Kalahari Tree Skink	LC	LC
Trachylepis sulcata sulcata	Western Rock Skink	LC	LC
Trachylepis varia	Variable Skink	LC	LC
Varanus albigularis albigularis	Rock Monitor	LC	LC
Varanus niloticus	Water Monitor	LC	LC
Xenocalamus bicolor bicolor	Bicoloured Quill-snouted Snake	LC	LC

8.4 Appendix D – Mammal species expected to occur within the project area

Species	Common Name	Conservation Status	
		Regional (SANBI, 2016)	Regional (SANBI, 2016)
Aethomys ineptus	Tete Veld Rat	LC	LC
Aethomys namaquensis	Namaqua rock rat	LC	LC
Antidorcas marsupialis	Springbok	LC	LC
Aonyx capensis	Cape Clawless Otter	NT	NT
Atelerix frontalis	South African Hedgehog	NT	LC
Atilax paludinosus	Water Mongoose	LC	LC
Canis mesomelas	Black-backed Jackal	LC	LC
Caracal caracal	Caracal	LC	LC
Chlorocebus pygerythrus	Vervet Monkey	LC	LC
Cynictis penicillata	Yellow Mongoose	LC	LC
Desmodillus auricularis	Cape Short-eared Gerbil	LC	LC
Eidolon helvum	African Straw-colored Fruit Bat	LC	NT
Eptesicus hottentotus	Long-tailed Serotine Bat	LC	LC
Felis nigripes	Black-footed Cat	VU	VU
Felis silvestris	African Wildcat	LC	LC
Genetta genetta	Small-spotted Genet	LC	LC
Gerbilliscus brantsii	Highveld Gerbil	LC	LC
Gerbilliscus leucogaster	Bushveld Gerbil	LC	LC
Gerbillurus paeba	Hairy-footed Gerbil	LC	LC
Herpestes pulverulentus	Cape Grey Mongoose	LC	LC
Herpestes sanguineus	Slender Mongoose	LC	LC
Hydrictis maculicollis	Spotted-necked Otter	VU	NT
Hystrix africaeaustralis	Cape Porcupine	LC	LC
Ictonyx striatus	Striped Polecat	LC	LC
Leptailurus serval	Serval	NT	LC
Lepus capensis	Cape Hare	Not listed	LC
Lepus saxatilis	Scrub Hare	LC	LC
Malacothrix typica	Gerbil Mouse	LC	LC
Mastomys coucha	Multimammate Mouse	LC	LC
Mellivora capensis	Honey Badger	LC	LC
Mus musculus	House Mouse	Not listed	LC
Neoromicia capensis	Cape Serotine Bat	LC	LC
Orycteropus afer	Aardvark	LC	LC
Otocyon megalotis	Bat-eared Fox	LC	LC
Panthera pardus	Leopard	VU	VU
Papio ursinus	Chacma Baboon	LC	LC

Parahyaena brunnea	Brown Hyaena	NT	NT
Parotomys brantsii	Brants's Whistling Rat	LC	LC
Pedetes capensis	Springhare	LC	LC
Phacochoerus africanus	Common Warthog	LC	LC
Poecilogale albinucha	African Striped Weasel	NT	LC
Procavia capensis	Rock Hyrax	LC	LC
Pronolagus rupestris	Smith's Red Rabbit	LC	LC
Proteles cristata	Aardwolf	LC	LC
Raphicerus campestris	Steenbok	LC	LC
Rattus rattus	House Rat	Not listed	LC
Redunca fulvorufula	Mountain Reedbuck	EN	LC
Rhabdomys pumilio	Xeric Four-striped Mouse	LC	LC
Rhinolophus clivosus	Geoffroy's Horseshoe Bat	NT	LC
Rhinolophus darlingi	Darling's Horseshoe Bat	LC	LC
Rhinolophus denti	Dent's Horseshoe Bat	NT	LC
Saccostomus campestris	Pouched Mouse	LC	LC
Steatomys krebsii	Kreb's Fat Mouse	LC	LC
Suncus varilla	Lesser Dwarf Shrew	LC	LC
Suricata suricatta	Meerkat	LC	LC
Sylvicapra grimmia	Common Duiker	LC	LC
Tadarida aegyptiaca	Egyptian Free-tailed Bat	LC	LC
Vulpes chama	Cape Fox	LC	LC
Xerus inauris	South African Ground Squirrel	LC	LC

8.5 Appendix E Specialist Declarations

DECLARATION

I, Martinus Erasmus, 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.

Martinus Erasmus

Ecologist

The Biodiversity Company

November 2022

DECLARATION

I, Andrew Husted, 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.

Andrew Husted

Ecologist

The Biodiversity Company

November 2022