# FAUNA & FLORA SPECIALIST STUDY:

# HOOGLAND NORTH 2 WIND ENERGY FACILITY

**PRODUCED FOR SLR ON BEHALF OF RED CAP**


3Foxes Biodiversity Solutions

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**Second Draft – January 2022**

**NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND ENVIRONMENTAL IMPACT REGULATIONS, 2014 (AS AMENDED) – REPORTING REQUIREMENTS FOR SPECIALIST THEMES**

| GN 320 of 20 March 2020: Terrestrial Biodiversity Assessment Report (Very High Sensitivity) | Section of Report |
|---|---|
| 3.1.1 contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the assessment including a curriculum vitae; | P8 |
| 3.1.2 a signed statement of independence by the specialist; | P10 |
| 3.1.3 a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment; | Section 2.5 |
| 3.1.4 a description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modelling used, where relevant; | Section 2.5 |
| 3.1.5 a description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations; | Section 2.7 |
| 3.1.6 a location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant); | Section 4 |
| 3.1.7 additional environmental impacts expected from the proposed development; | Section 5; Section 6 |
| 3.1.8 any direct, indirect and cumulative impacts of the proposed development; | Section 5; Section 6 |
| 3.1.9 the degree to which impacts and risks can be mitigated; | Section 6 |
| 3.1.10 the degree to which the impacts and risks can be reversed; | Section 6 |
| 3.1.11 the degree to which the impacts and risks can cause loss of irreplaceable resources; | Section 6 |
| 3.1.12 proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr); | Section 6 |
| 3.1.13 a motivation must be provided if there were development footprints identified as per paragraph 2.3.6 [of GN 320 of 20 March 2020] that were identified as having a "low" terrestrial biodiversity sensitivity and that were not considered appropriate; | Section 2.8 |
| 3.1.14 a substantiated statement, based on the findings of the specialist assessment, regarding the acceptability, or not, of the proposed development, if it should receive approval or not; and | Section 7 |
| 3.1.15 any conditions to which this statement is subjected. | Section 7 |

| GN 1150 of 30 October 2020: Terrestrial Animal Species Specialist Assessment Report (Very High or High Sensitivity) | Section of Report |
|---|---|
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| 3.1.2 a signed statement of independence by the specialist; | P10 |
| 3.1.3 a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment; | Section 2.5 |
| 3.1.4 a description of the methodology used to undertake the site sensitivity verification, impact assessment and site inspection, including equipment and modelling used where relevant; | Section 2.5 |
| 3.1.5 a description of the mean density of observations/number of sample sites per unit area and the site inspection observations; | Section 2.5 |
| 3.1.6 a description of the assumptions made and any uncertainties or gaps in knowledge or data; | Section 2.7 |
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| 3.1.13 a motivation must be provided if there were any development footprints identified as per paragraph 2.2.12 above [of GN 1150 of 30 October 2020] that were identified as having “low” or “medium” terrestrial animal species sensitivity and were not considered appropriate. | Section 2.8 |

| GN 1150 of 30 October 2020: Terrestrial Plant Species Compliance Statement (Low Sensitivity) | Section of Report |
|---|---|
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Ecological Solutions for People & the Environment

Simon Todd is Director and principal scientist at 3Foxes Biodiversity Solutions and has over 20 years of experience in biodiversity measurement, management and assessment. He has provided specialist ecological input on more than 200 different developments distributed widely across the country, but with a focus on the three Cape provinces. This includes input on the Wind and Solar SEA (REDZ) as well as the Eskom Grid Infrastructure (EGI) SEA and Karoo Shale Gas SEA. He is on the National Vegetation Map Committee as representative of the Nama and Succulent Karoo Biomes. Simon Todd is a recognised ecological expert and is a past chairman and current deputy chair of the Arid-Zone Ecology Forum. He is registered with the South African Council for Natural Scientific Professions (No. 400425/11).

*Skills & Primary Competencies*

- Research & description of ecological patterns & processes in Nama Karoo, Succulent Karoo, Thicket, Arid Grassland, Fynbos and Savannah Ecosystems.
- Ecological Impacts of land use on biodiversity
- Vegetation surveys & degradation assessment & mapping
- Long-term vegetation monitoring
- Faunal surveys & assessment.
- GIS & remote sensing

*Tertiary Education:*

- 1992-1994 – BSc (Botany & Zoology), University of Cape Town
- 1995 – BSc Hons, Cum Laude (Zoology) University of Natal
- 1996-1997- MSc, Cum Laude (Conservation Biology) University of Cape Town

*Employment History*

- 2009 – Present – Sole Proprietor of Simon Todd Consulting, providing specialist ecological services for development and research.
- 2007 Present – Senior Scientist (Associate) – Plant Conservation Unit, Department of Botany, University of Cape Town.
- 2004-2007 – Senior Scientist (Contract) – Plant Conservation Unit, Department of Botany, University of Cape Town

- 2000-2004 – Specialist Scientist (Contract ) - South African National Biodiversity Institute
- 1997 – 1999 – Research Scientist (Contract) – South African National Biodiversity Institute

A selection of recent work is as follows:

**Strategic Environmental Assessments**

Co-Author. Chapter 7 - Biodiversity & Ecosystems - Shale Gas SEA. CSIR 2016.

Co-Author. Chapter 1 Scenarios and Activities – Shale Gas SEA. CSIR 2016.

Co-Author – Ecological Chapter – Wind and Solar SEA. CSIR 2014.

Co-Author – Ecological Chapter – Eskom Grid Infrastructure SEA. CSIR 2015.

Contributor – Ecological & Conservation components to SKA SEA. CSIR 2017.

**Recent Specialist Ecological Studies in the Vicinity of the Current Site**

Environmental Impact Assessment for the Proposed Komsberg East and Komsberg West Wind Farms and Associated Grid Connection Infrastructure: Fauna & Flora Specialist Impact Assessment. Arcus Consulting 2014.

Proposed Rietkloof & Brandvallei Wind Farms and Associated Grid Connection Infrastructure: Fauna & Flora Specialist Impact Assessment Report. EOH 2016.

Proposed Gunstfontein Wind Farm and Associated Grid Connection Infrastructure: Fauna & Flora Specialist Impact Assessment Report. Savannah Environmental 2016.

Mainstream South Africa Dwarsrug Wind Energy Facility: Fauna & Flora Specialist Impact Assessment Report. Sivest 2014.

Phezukomoya and San Kraal Wind Energy Facilities and associated grid connection. Fauna and Flora specialist studies. Arcus Consulting 2018.

Kokerboom Wind Energy Facilities (1-4) and associated grid connections. Fauna and Flora specialist studies. Aurecon 2017.

## SPECIALIST DECLARATION

I, ..Simon Todd....., as the appointed independent specialist, in terms of the 2014 EIA Regulations, hereby declare that I:

- I act as the independent specialist in this application;
- I 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;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- 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 have no vested interest in the proposed activity proceeding;
- 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;
- I have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- I have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the specialist: 

Name of Specialist: ____Simon Todd_____

Date: ____20 October 2021_____

# *1 INTRODUCTION*

Red Cap Energy (Pty) Ltd and their affiliate companies is proposing to develop two wind farms on a ca. 35,000ha site situated about 12km south of Loxton along R381, within the Beaufort West Local Municipality, Central Karoo District Municipality, Western Cape. SLR are conducting the required EIA process and 3Foxes Biodiversity Solutions has been appointed by SLR South Africa Consulting (Pty) Ltd, on behalf of Red Cap Energy (Pty) Ltd to provide a specialist terrestrial fauna and flora specialist pre-application study of the two proposed wind farms as part of the EIA applications, collectively known as the Hoogland Northern Wind Farm Cluster. Hoogland North 2 Wind Farm and Hoogland North 1 Wind Farm are adjacent to one another and will share a grid connection, named the Hoogland Northern Grid Connection. The Grid Connection would be a 132kV overhead power line and will connect the Hoogland Northern Wind Farms to the Nuweveld Collector Substation on Red Cap's adjacent Nuweveld Wind Farms Project. Power will then be fed into the Eskom Droërivier Substation located near Beaufort West via the proposed Nuweveld Gridline. As the Northern Grid Connection would be separate authorisation, this is dealt with in an independent report and is not covered further here. The scope of this report is restricted to the Hoogland North 2 Wind Farm and affected area.

The purpose of the Hoogland North 2 Terrestrial Biodiversity Report is to describe and detail the ecological features of the proposed wind farm site; provide an assessment of the ecological sensitivity of the affected area and identify the likely impacts that may be associated with the development of the Wind Farm and associated infrastructure. Numerous site visits (detailed in Section 2.5) as well as a desktop review of the available ecological information for the area was conducted in order to identify and characterise the ecological features of the site. This information is used to derive an ecological sensitivity map that presents the ecological constraints for the development and which have been used to inform the initial layout of the development. Although the current study is a scoping study, a preliminary assessment is provided in which impacts are assessed for the pre-construction, construction, operation, and decommissioning phases of the development. A variety of avoidance and mitigation measures associated with each identified impact are recommended in order to reduce the likely impact of the development, which should be included in the EMPr for the development. Finally, a statement is made as to the general ecological acceptability of the Hoogland North 2 Wind Farm and whether or not the development should proceed to the EIA phase is made.

# *2 METHODOLOGY*

## 2.1 SCOPE OF STUDY

The study includes the following activities:

- a description of the environment that may be affected by a specific activity and the manner in which the environment may be affected by the proposed project;

- a description and evaluation of environmental issues and potential impacts (including assessment of direct, indirect and cumulative impacts) that have been identified;
- a statement regarding the potential significance of the identified issues based on the evaluation of the issues/impacts;
- an indication of the methodology used in determining the significance of potential environmental impacts;
- an assessment of the significance of direct, indirect and cumulative impacts of the development;
- a description and comparative assessment of all alternatives including cumulative impacts;
- recommendations regarding practical mitigation measures for potentially significant impacts, for inclusion in the Environmental Management Programme (EMPr);
- an indication of the extent to which the issue could be addressed by the adoption of mitigation measures;
- a description of any assumptions uncertainties and gaps in knowledge; and
- an environmental impact statement which contains:
    - a summary of the key findings of the environmental impact assessment;
    - an assessment of the positive and negative implications of the proposed activity; and
    - a comparative assessment of the positive and negative implications of identified alternatives.

General Considerations for the study included the following:

- Disclose any gaps in information (and limitations in the study) or assumptions made.
- Identify recommendations for mitigation measures to minimise impacts.
- Outline additional management guidelines.
- Provide monitoring requirements, mitigation measures and recommendations in a table format as input into the EMPr for faunal or flora related issues.
- The assessment of the potential impacts of the development and the recommended mitigation measures provided have been separated into the following project phases:
    - Planning and Construction
    - Operational
    - Decommissioning

## 2.2 APPROACH & ASSESSMENT PHILOSOPHY

This assessment is conducted according to the 2014 EIA Regulations (Government Notice Regulation 982, as amended) in terms of the National Environmental Management Act (Act 107 of 1998) as amended (NEMA), as well as the recently promulgated notice issued in terms of NEMA, *"National Environmental Management Act, 1998 (Act No. 107 Of 1998): Procedures to be followed for the assessment and minimum criteria for reporting of identified environmental*

*themes in terms of section 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation [G 43110 – GN 320]*"[1]

In terms of NEMA, this assessment demonstrates how the proponent intends to comply with the principles contained in Section 2 of NEMA, which amongst other things, indicates that environmental management should:

- (In order of priority) aim to: avoid, minimise or remedy disturbance of ecosystems and loss of biodiversity;
- Avoid degradation of the environment;
- Avoid jeopardising ecosystem integrity;
- Pursue the best practicable environmental option by means of integrated environmental management;
- Protect the environment as the people's common heritage;
- Control and minimise environmental damage; and
- Pay specific attention to management and planning procedures pertaining to sensitive, vulnerable, highly dynamic or stressed ecosystems.

Furthermore, in terms of best practice guidelines as outlined by Brownlie (2005) and De Villiers *et al.* (2005), a precautionary and risk-averse approach should be adopted for projects which may result in substantial detrimental impacts on biodiversity and ecosystems, especially the irreversible loss of habitat and ecological functioning in threatened ecosystems or designated sensitive areas: i.e. CBAs/ESAs (as identified by systematic conservation plans, Biodiversity Sector Plans or Bioregional Plans) and Freshwater Ecosystem Priority Areas (FEPA).

In order to adhere to the above principles and best-practice guidelines, the following approach forms the basis for the study approach and assessment philosophy:

- The study includes data searches, desktop studies, site walkovers / field survey of the property and baseline data collection, describing:
    - The broad ecological characteristics of the site and its surrounds in terms of any mapped spatial components of ecological processes and/or patchiness, patch size, relative isolation of patches, connectivity, corridors, disturbance regimes, ecotones, buffering, viability, etc.

In terms of **pattern**, the following will be identified or described:

***Community and ecosystem level***

- The main vegetation type, its aerial extent and interaction with neighbouring types, soils or topography;
- Threatened or vulnerable ecosystems (*cf. SA vegetation map/National Spatial Biodiversity Assessment, fine-scale systematic conservation plans, etc*).

[1] Please see Appendix x for Site Sensitivity Verification Report

***Species level[2]***

- Species of Conservation Concern (SCC) (giving location if possible using GPS);
- The viability of an estimated population size of the SCC species that are present (including the degree of confidence in prediction based on availability of information and specialist knowledge, i.e. High=70-100% confident, Medium 40-70% confident, low 0-40% confident);
- The likelihood of other Red Data Book species, or SCC, occurring in the vicinity (include degree of confidence).

***Fauna***

- Describe and assess the terrestrial fauna present in the area that will be affected by the proposed development;
- Conduct a faunal[3] assessment that can be integrated into the ecological study;
- Describe the existing impacts of current land use as they affect the fauna;
- Clarify species of special concern and that are known to be:
  - endemic to the region;
  - that are considered to be of conservational concern;
  - that are in commercial trade (CITES listed species); or
  - are of cultural significance.
- Provide monitoring requirements as input into the EMPr for faunal related issues.

***Other pattern issues***

- Any significant landscape features or rare or important vegetation associations such as seasonal wetlands, alluvium, seeps, quartz patches or salt marshes in the vicinity'.
- The extent of alien plant cover of the site, and whether the infestation is the result of prior soil disturbance such as ploughing or quarrying (alien cover resulting from disturbance is generally more difficult to restore than infestation of undisturbed sites).
- The condition of the site in terms of current or previous land uses.

In terms of **process**, the following will be identified and/or described:

- The key ecological "drivers" of ecosystems on the site and in the vicinity, such as fire.
- Any mapped spatial component of an ecological process that may occur at the site or in its vicinity (i.e. *corridors* such as watercourses, upland-lowland gradients, migration routes, coastal linkages or inland-trending dunes, and *vegetation boundaries* such as edaphic interfaces, upland-lowland interfaces or biome boundaries).
- Any possible changes in key processes, e.g. increased fire frequency or drainage/artificial recharge of aquatic systems.
- Furthermore, any further studies that may be required during or after the EIA process will be outlined.

[2] Species level assesements for Riverine Rabbit (*Bunolagus monticularis*) and Karoo Padloper Tortoise (*Chersobius boulengeri*) are addressed and integrated in this Terrestrial Ecology report. Birds identified in the Animal Theme are addressed in the Avifaunal report.

[3] Excluding Avifauna and Bat Species

- All relevant legislation, permits and standards that would apply to the development will be identified.
- The opportunities and constraints for development will be described and shown graphically on an aerial photograph, satellite image or map delineated at an appropriate level of spatial accuracy.

## 2.3 RELEVANT ASPECTS OF THE DEVELOPMENT

The Hoogland North 2 Wind Farm is part of the Hoogland Northern Cluster and is located along the R381 south of Loxton. The layout and location of the Hoogland North 2 Wind Farm is illustrated below in Figure 1 and includes 82 potential turbine locations of which a maximum of 60 turbines would ultimately be developed on site. A summary of the project components and their estimated footprint areas is provided below in Table 1.

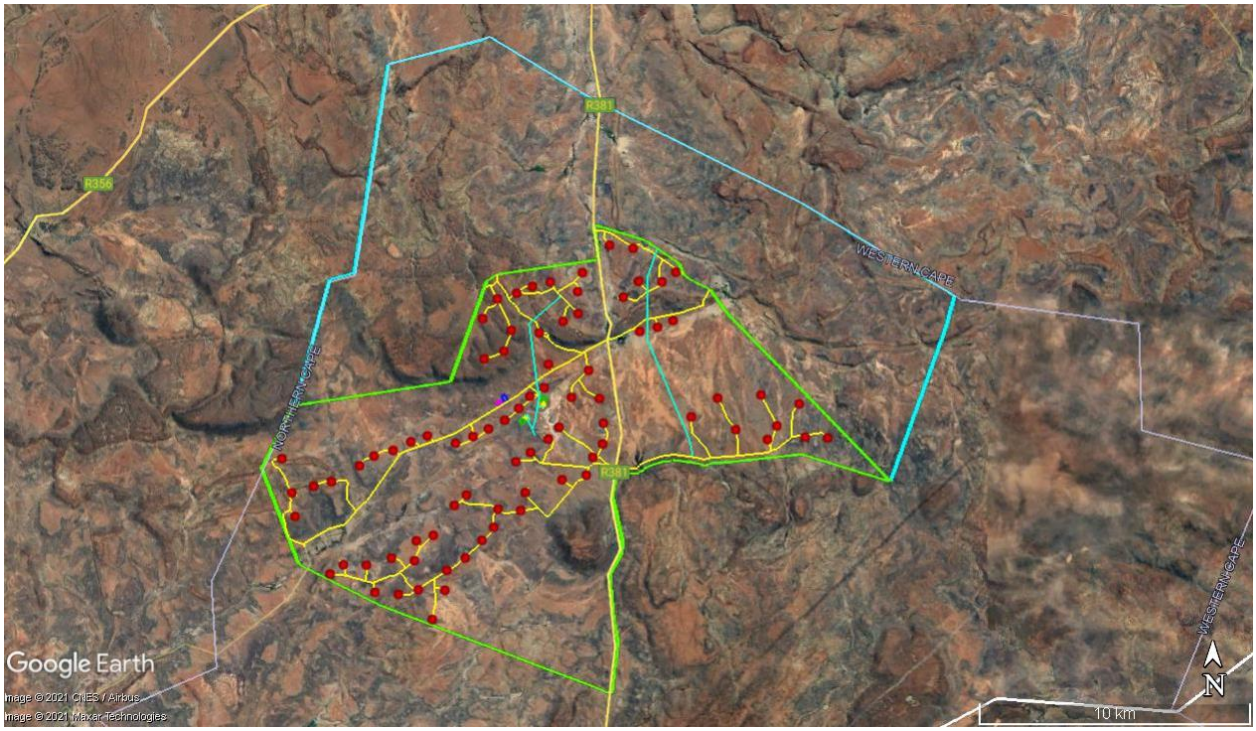


**Figure 1.** Satellite image showing the location of the proposed Hoogland North 2 Wind Farm within the Northern Wind Farm Cluster, south of Loxton, but within the Western Cape. The preliminary turbine and road layout for Hoogland 2 Wind Farm is depicted.

**Table 1:** Summary of the components, specifications, and approximate areas of impact of the Hoogland North 2 Wind Farm based on a maximum of 60 turbines*

| Project Components | Description | Hoogland 2 |
|---|---|---|
| **Location** | Central coordinates: | 31°43'16.68"S, 22°19'50.27"E |
| **Access** | For commuter traffic and some small loads, access from the south would be via Beaufort West via the N1 and R381 travelling between Beaufort West and Loxton. For abnormal loads the main access routes for each wind farm are as follows: | Through Loxton, south along the R381 towards HL01 and HL02 |
| **Extent** | The total area of the site being considered for developing the wind farm: | 17,799 ha |
| **Number of wind turbines and generation capacity** | Up to a maximum of 60 wind turbines per wind farm will be developed. The targeted nameplate generation capacity for each wind farm is up to a maximum of 420 MW. | 60 |
| | However, the number of turbines included in the layout for approval for each wind farm is as follows: | 82 |
| **Wind turbine specifications** | ● Rotor diameter: 100 m to 195 m (50 m to 97.5 m blade / radius)<br>● Hub height: 80 m to 150 m<br>● Rotor top tip height: 130 m to 247.5 m (maximum based on 150 m hub + 97.5 m blade = 247.5 m)<br>● Rotor bottom tip height: minimum of 20 m (and not lower).<br>See Figure 3-1 below. | - |
| **Turbine Foundations** | Each turbine will have a circular foundation with a diameter of up to 35 m, alongside the 40 m hardstand (1,400 $m^2$). The permanent total footprint is as follows: | 8.4 ha (permanent) |
| **Turbine Hardstands and Laydown Areas** | Each turbine will have a permanent crane pad of 80 m x 40 m placed adjacent to each turbine foundation. The total permanent footprints are as follows: | 19.2 ha (permanent) |
| | An additional 20 m x 40 m of temporary hardstand area will also be required near each of the crane pads. Further, a blade laydown area of 104 m x 20 m and an additional embankment area (where necessary due to slopes) of | 31.2 ha (temporary) |

| Project Components | Description | Hoogland 2 |
|---|---|---|
| | approximately 104 m x 5 m will be required. A temporary crane boom assembly area of 120 x 15 m will also be accommodated.<br>Temporary areas are up to a maximum of a maximum of 5,200 $m^2$ per turbine. The total temporary footprints per wind farm are as follows: | |
| **Cabling** | Turbines to be connected to on-site substation via up to 33 kV cables. Cables to be laid underground in trenches mainly adjacent to proposed wind farm roads (as part of the temporary impact of 'Site roads' below) but in some instances the cables will deviate from the road.<br>Such sections of off-road cables amount to the following length and footprint: | 5.3 km<br>3.2 ha<br>(temporary) |
| | Where it has been possible, cables have been routed along existing local roads.<br>Note that cables running next to public roads will not be able to run within the road reserve, but as close as possible to the road reserve in the adjacent private owned land.<br>These have the following length and footprint: | 18.8 km<br>11.3 ha<br>(temporary) |
| **Internal wind farm overhead power lines** | In limited instances, overhead monopole lines will be used where burying is not possible due to technical, geological, environmental or topographical constraints. Up to 33 kV overhead power lines supported by 132 kV monopole style pylons of up to 20 m high will be required, as well as tracks for access to the pylons.<br>The total length of the line and the footprint of the pylons and tracks are as follows: | 3.5 km<br>2.1 ha (permanent) |
| | Where possible, to reduce areas of new impact, sections of overhead line have been routed next to proposed Eskom overhead lines. Such sections of overhead lines have the following additional length and footprint: | 14.7 km<br>8.8 ha (permanent) |
| **Site roads** | The total road network for each wind farm* is as follows: | 110.8 km |
| | Permanent roads will be 6 m wide and over above this may require side drains on one or both sides depending on the topography. Many roads will have underground cables running next to them.<br>The permanent footprint of the road network for each wind farm is as follows: | *88.7 ha (permanent) |

| Project Components | Description | Hoogland 2 |
|---|---|---|
| | An up to 15 m wide road corridor may be temporarily impacted during construction and rehabilitated to allow for a 6 m road surface after construction.<br>The temporary footprint of the road network for each wind farm is as follows: | *99.7 ha (temporary) |
| **Wind farm Substations** | Each wind farm will have a 150 m x 75 m substation yard that will include an Operation and Maintenance (O&M) building, Substation building and a High Voltage Gantry.<br>The area for the substation yards are as follows: | 1.1 ha (permanent) |
| **Battery energy storage system (BESS)** | Each wind farm will also potentially have a ±3.5 ha area for a battery energy storage system (BESS) which may be adjacent or slightly removed from the substation depending on the local constraints.<br>The BESS may either be connected to the wind farm substation by an underground or overhead cable or may require its own substation which would be located within the BESS footprint and would be connected directly to the Eskom switching station via a short 132 kV overhead line. | 3.5 ha (permanent) |
| **Operations and maintenance (O&M) area** | The O&M area will include all offices, stores, workshops and laydown area. The substation building will be housed in the substation yard. | Forms part of substation yard |
| **Security** | Security gate and hut to be installed at most entrances to each wind farm site (estimated as 4 entrances each at 20 $m^2$).<br>No fencing around individual turbines, existing fencing shall remain around perimeter of properties.<br>Temporary and permanent yard areas to be enclosed (with access control) with an up to 2.4 m high fence. | 80 $m^2$ |
| **Temporary areas required for the construction / decommissioning phase** | Each wind farm will have the following temporary construction areas:<br>● Temporary site camp/s areas of ±20,000 $m^2$<br>● Batching plant area of ±2,000 $m^2$<br>● General laydown area of ± 36,000 $m^2$ | 6 ha (temporary) |

| Project Components | Description | Hoogland 2 |
|---|---|---|
| | ● Each wind farm will have a bunded fuel & lubricants storage facility at the site camp.<br>Individual turbine temporary laydown areas including crane boom laydown areas, blade laydown areas and other potential temporary areas are detailed above under “turbine hardstands”. | |
| **Shared infrastructure:**<br>**N1 Bypass Road** | As part of the Nuweveld Wind Farms, a temporary bypass road is required on the N1 to avoid the town of Beaufort West with the major Wind Farm components. The road surface will be up to 6 m wide, with side drains, but a 12 m wide road corridor may be temporarily impacted during construction and rehabilitated once construction is complete.<br>The length of the temporary road will be about 5.6 km of which about 2.5 km is along an existing track. It is planned that this road will also be used by the Hoogland Wind Farms and this is why it is shared infrastructure between the Nuweveld projects and these projects. | 6.8 ha (shared, temporary) |
| **Other shared infrastructure** | Stream crossings upgrades along the R381 to the north of the project area and along the DR02314 to the north-west of the project area are required. | 4.4 ha (shared, permanent)<br>5 ha (shared, temporary) |
| **Total disturbance footprint** | | 163.2 ha temporary and 136.2 ha permanent |

*Note these areas represent more than will be impacted given the road values are based on all the turbines shown in the layout for each individual wind farm being constructed wherein reality only 60 of these turbines will be developed per wind farm.

## 2.4 DATA SOURCING AND REVIEW

Data sources from the literature consulted and used where necessary in the study includes the following:

*Vegetation:*

- Vegetation types and their conservation status were extracted from the South African National Vegetation Map (2018 update).
- Information on plant and animal species recorded for the wider area was extracted from the South African Biodiversity Information Facility (SABIF)/ SANBI Integrated Biodiversity Information System (SIBIS) database hosted by the South African National Biodiversity Institute (SANBI). Data was extracted for a significantly larger area than the study area, but this is necessary to ensure a conservative approach as well as counter the fact that the site itself has not been well sampled in the past.
- The International Union for Conservation of Nature (IUCN) conservation status of the species in the list was also extracted from the database and is based on the Threatened Species Programme, Red List of South African Plants (2021).

*Ecosystem:*

- Freshwater and wetland information was extracted from the National Freshwater Ecosystem Priority Areas assessment, NFEPA (Nel *et al.* 2011) as well as the 2018 NBA.
- Critical Biodiversity Areas (CBAs) in the study area were obtained from the 2017 Western Cape Biodiversity Spatial Plan (WC-BSP), for the Beaufort West Municipality, which includes the study area.

*Fauna*

- Lists of mammals, reptiles and amphibians which are likely to occur at the site were derived based on distribution records from the literature and the ADU databases (ReptileMap, Frogmap and MammalMap) http://vmus.adu.org.za.
- Literature consulted includes Branch (1988) and Alexander and Marais (2007) for reptiles, Du Preez and Carruthers (2009) for amphibians, EWT & SANBI (2016) and Skinner and Chimimba (2005) for mammals.
- The faunal species lists provided are based on species which are known to occur in the broad geographical area, as well as an assessment of the availability and quality of suitable habitat at the site.
- The conservation status of mammals is based on the IUCN Red List Categories (EWT/SANBI 2016), while reptiles are based on the South African Reptile Conservation Assessment (Bates *et al*. 2013) and amphibians on Minter *et al.* (2004) as well as the IUCN (2020).

- Apart from the current study, an independent reptile study with a focus on reptile SCC has been conducted by Sungazer and which includes an assessment of the impacts of the development on reptiles of concern.

## 2.5 SITE VISITS & FIELD ASSESSMENT

The Hoogland North site was visited on three occasions for the current study, from 17-24 April 2021, 8-10 September and 21-23 September 2021. The initial site visit included a helicopter flight across the wind farm and grid connection study area, which was important in obtaining an aerial view of features not easily observed on the ground. During the site visits, the wind farm site was extensively investigated in the field. Potentially sensitive features within the site were investigated, validated and characterised in the field including any pans, rocky outcrops and major drainage features that were observed in the field or from satellite imagery of the site. Particular attention was paid to the integrity of habitats present as well as the broader ecological context in terms of connectivity and broad-scale ecological processes likely to be operating at the site.

In terms of the actual sampling approaches that were used, the vegetation of the site was characterised through walk-through surveys distributed across the site, in which plant species lists for the different habitats observed were compiled. Specific attention was paid to the presence of species of conservation concern (SCC) as well as other species which are considered to be of ecological significance. In terms of fauna, active searches were conducted for reptiles and amphibians across the site, within habitats where such species are likely to be encountered. In addition, all reptiles and amphibians encountered while doing other field work were recorded. As the Riverine Rabbit is a species of particular concern at the site, camera trapping was extensively used across the Hoogland Northern site to establish the presence or absence of the Riverine Rabbit and also to characterise the fauna of the site more generally. A total of 50 camera traps were distributed across the Hoogland North cluster, which includes the Hoogland North 1 Wind Farm and Hoogland North 2 Wind Farm project areas. The camera traps were concentrated within riparian and floodplain areas identified as the most favourable potential habitat for this species. This amounted to approximately two-thirds of the cameras and the remainder were located in other habitats. In order to increase the number of fauna captured, the cameras were placed along paths, fences etc. where fauna are likely to pass and be captured by the cameras. The cameras were placed in the field in June 2021 and checked in October 2021, giving rise to four months of camera trapping to inform the current study. The cameras remain in the field and will be used to inform the EIA Phase of the project.

## 2.6 SENSITIVITY MAPPING & ASSESSMENT

An ecological sensitivity map of the site was produced by integrating the results of the site visits with the available ecological and biodiversity information in the literature and various spatial databases as described above. As a starting point, mapped sensitive features such as wetlands, drainage lines, rocky hills and pans were collated and buffered where appropriate to comply with

legislative requirements or ecological considerations. Additional sensitive areas were then identified from the satellite imagery of the site and delineated. All the different layers created were then merged to create a single coverage. The ecological sensitivity of the different units identified in the mapping procedure was rated according to the scale as indicated below.

- **Low** – Areas of natural or transformed habitat with a low sensitivity where there is likely to be a negligible impact on ecological processes and terrestrial biodiversity. Most types of development can proceed within these areas with little ecological impact.
- **Medium**- Areas of natural or previously transformed land where the impacts are likely to be largely local and the risk of secondary impact such as erosion low. These areas usually comprise the bulk of habitats within an area. Development within these areas can proceed with relatively little ecological impact provided that appropriate mitigation measures are taken.
- **High** – Areas of natural or transformed land where a high potential impact is anticipated due to the high biodiversity value, sensitivity or important ecological role of the area. These areas may contain or be important habitat for faunal species or provide important ecological services such as water flow regulation or forage provision. Development within these areas is undesirable and should only proceed with caution (such as specific consideration of the footprint within these areas and field verification of the acceptability of development within these potentially sensitive areas) as it may not be possible to mitigate all impacts appropriately.
- **Very High/No-Go** – Critical and unique habitats that serve as habitat for rare/endangered species or perform critical ecological roles. These areas are usually no-go areas from a developmental perspective and must be avoided.

For the current development, sensitivity mapping was differentiated between different types of infrastructure based on their potential impacts. For example, turbines generate noise and movement which is not the same as the noise and disturbance generated by the wind farm service roads. For this purpose, turbines, substations, the BESS and other built infrastructure are considered separately from roads and underground cabling and two different sensitivity maps are produced for each category of infrastructure.

***Limits of Acceptable Change***

Over and above the sensitivity rating mapping, a further level of impact reduction is applied by using limits of acceptable change within each of these sensitivity ratings. Limits of acceptable change for each sensitivity category are indicated below and refer to the extent of on-site habitat loss within each sensitivity category that is considered acceptable before significant ecological impact that is difficult to mitigate and which may compromise the development is likely to occur. The limits of acceptable change are better assessed in a cumulative approach and have thus been determined considering the outer boundaries of the two wind farms that comprise the Hoogland Northern Wind Farm Cluster. As the sensitive habitats are not defined by each

individual wind farm boundary but run across these ecologically arbitrary boundaries it makes more sense from an ecological perspective to look at the two adjacent wind farms together when looking at limits of acceptable change as this would be assessing the worst-case scenario for such change. If one of the wind farms does not go ahead for some reason, then there will be less habitat loss than is being assumed here which ensures that this assessment represents a worst-case scenario in terms of habitat loss within each sensitivity category. This provides a guide for the developer in terms of ensuring that the spatial distribution of impact associated with the development is appropriate with respect to the sensitivity of the site. In addition, it provides a benchmark against which impacts can be assessed and represents an explicit threshold that when exceeded indicates that potentially unacceptable impacts may have occurred. In terms of this latter criterion, exceeding the limits of acceptable change for either High or Very High/No-Go sensitivity areas is considered to represent an immediate fatal flaw, while the limits within either Low or Medium sensitivity areas could potentially be exceeded, provided that the total footprint in these two areas combined does not exceed the overall combined acceptable loss within these classes. However, in the latter case, this would raise significant concern regarding the suitability of the development and the exact spatial configuration of the development and the likely impacts on ecological processes would need to be considered.

It is important to note that irrespective of the limits of acceptable change and whether the development is within the limits, the specialist may still identify areas within the site that are unacceptable for development and will require the turbines and/or infrastructure to be moved outside these areas. This is further discussed in Section 5.

**Table 2.** Limits of acceptable change associated with the wind farm development, within each of the sensitivity categories as defined below.

| Sensitivity | Acceptable Loss | Description |
|---|---|---|
| **Low** | 5% | Units with a low sensitivity where there is likely to be a low impact on ecological processes and terrestrial biodiversity. This category represents transformed or natural areas where the impact of development is likely to be local in nature and of low significance with standard mitigation measures. |
| **Medium** | 2% | Areas of natural or previously transformed land where the impacts are likely to be largely local and the risk of secondary impacts such as erosion low. Development within these areas can proceed with relatively little ecological impact provided that appropriate mitigation measures are taken. |
| **High** | 1% | Areas of natural or transformed land where a high impact is anticipated due to the high biodiversity value, sensitivity or important ecological role of the area. Development within these areas is undesirable and should only proceed with caution. Where roads are |

| Sensitivity | Acceptable Loss | Description |
|---|---|---|
| | | required through these areas, existing access roads should preferably be used as this reduces both the impact and the footprint of any access roads. |
| **Very High/No Go** | <0.1% | Critical and unique habitats that serve as habitat for rare/endangered species or perform critical ecological roles. These areas represent no-go areas from a developmental perspective and should be avoided. |

## 2.7 LIMITATIONS & ASSUMPTIONS

The current study is based on several site visits as well as an associated desktop study. This significantly reduces the assumptions required for the current study and in particular the sensitivity mapping. In addition, the site is adjacent to the Nuweveld Wind Farms[4] that have been extensively investigated. This information is used to inform the current study as and where appropriate. The vegetation during the site visits was however relatively dry and the current sampling period follows an extended drought in the area, with the result that the vegetation of the site was not all in a good growing condition. However, there do not appear to be many significant constraints regarding plant species, with the result that this is not likely to have significantly affected the current study to a significant degree.

In terms of fauna, the presence of some fauna is difficult to verify in the field as these may be shy or rare and their potential presence at the site must be evaluated based on the literature and available databases. In many cases, these databases are not intended for fine-scale use and the reliability and adequacy of these data sources relies heavily on the extent to which the area has been sampled in the past. As many remote areas have not been well sampled, the species lists derived for the area do not always adequately reflect the actual fauna and flora present at the site. In order to reduce this limitation, and ensure a conservative approach, the species lists derived for the project site from the literature were obtained from an area significantly larger than the study site. In addition, the information from the adjacent Nuweveld WEFs is also used to inform the current project where relevant. Although there are some limitations regarding the fauna at the site and the possibility that some species present will be overlooked, overall, this would be restricted to a low number of species and is not likely to be of significance given that the general approach is to take a conservative approach and avoid all identified important faunal habitats.

[4] Nuweveld North Wind Farm (DFFE REF. NO.: 14/12/16/3/3/2/2042), Nuweveld West Wind Farm DFFE REF. NO.: (14/12/16/3/3/2/2043), Nuweveld East Wind Farm (DFFE REF. NO.: 14/12/16/3/3/2/2044) and Nuweveld Gridline (DFFE REF. NO.: 14/12/16/3/3/1/2336)

## 2.8 DFFE SITE VERIFICATION

Government Notice No. 320, dated 20 March 2020, includes the requirement that an Initial Site Sensitivity Verification Report must be produced for a development footprint. The outcomes of the Site Verification Report determine the level of assessment required for the site. The DFFE Screening Tool identified the entire site as having a medium and high animal sensitivity theme due to the presence of the Riverine Rabbit in the area and the modelled potential presence of the Karoo Padloper. In addition, avifauna are included under the animal theme and includes four bird species of concern; avifauna have been assessed separately by Jon Smallie of Wildskies (Pty) Ltd. Refer to the Table 3 and Figure 2 below for the Animal Theme results.

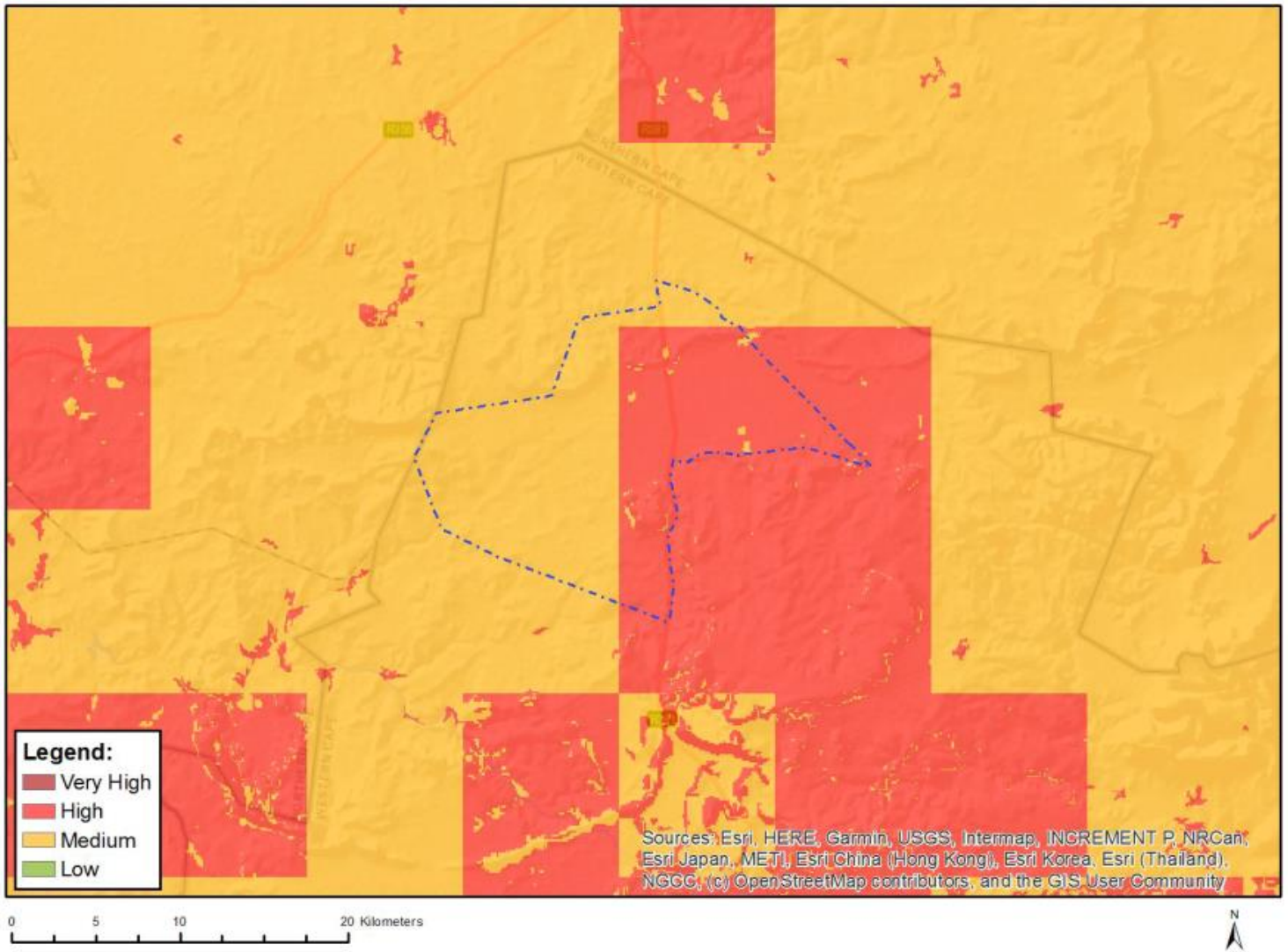


**Figure 2.** Animal Species Theme Sensitivity Map

**Table 3.** Animal Species Theme Features

| Sensitivity | Feature(s) |
|---|---|
| High | *Aves-Neotis ludwigii* |
| High | *Aves-Aquila verreauxii* |
| **High** | ***Mammalia-Bunolagus monticularis*** |
| **Medium** | ***Reptilia-Chersobius boulengeri*** |
| **Medium** | ***Mammalia-Bunolagus monticularis*** |
| Medium | *Aves-Neotis ludwigii* |
| Medium | *Aves-Aquila verreauxii* |

There were no botanical sensitivities known from the area (Figure 3) and the overall combined Terrestrial Biodiversity theme indicates that the site consists largely of low sensitivity areas with areas of Very High sensitivity associated with the CBAs, NFEPA Catchments and drainage features of the site (Figure 4 and Table 4). The outputs of the Screening Tool are based on existing biodiversity information, which for many areas such as Hoogland, is very sparse and not well-populated, with the result that this consists largely of modelled data and the potential presence of species of concern which need to be verified through the field assessment and site verification exercise. Already, based on the results of the adjacent Nuweveld Wind Farms study, there are several additional fauna species of concern that are either confirmed present such as the Mountain Reedbuck, or potentially present on site or in the general area including the Black-footed Cat *Felis nigripes* (VU), Grey Rhebok *Pelea capreolus* (NT), and Brown Hyena *Hyaena brunnea* (NT).

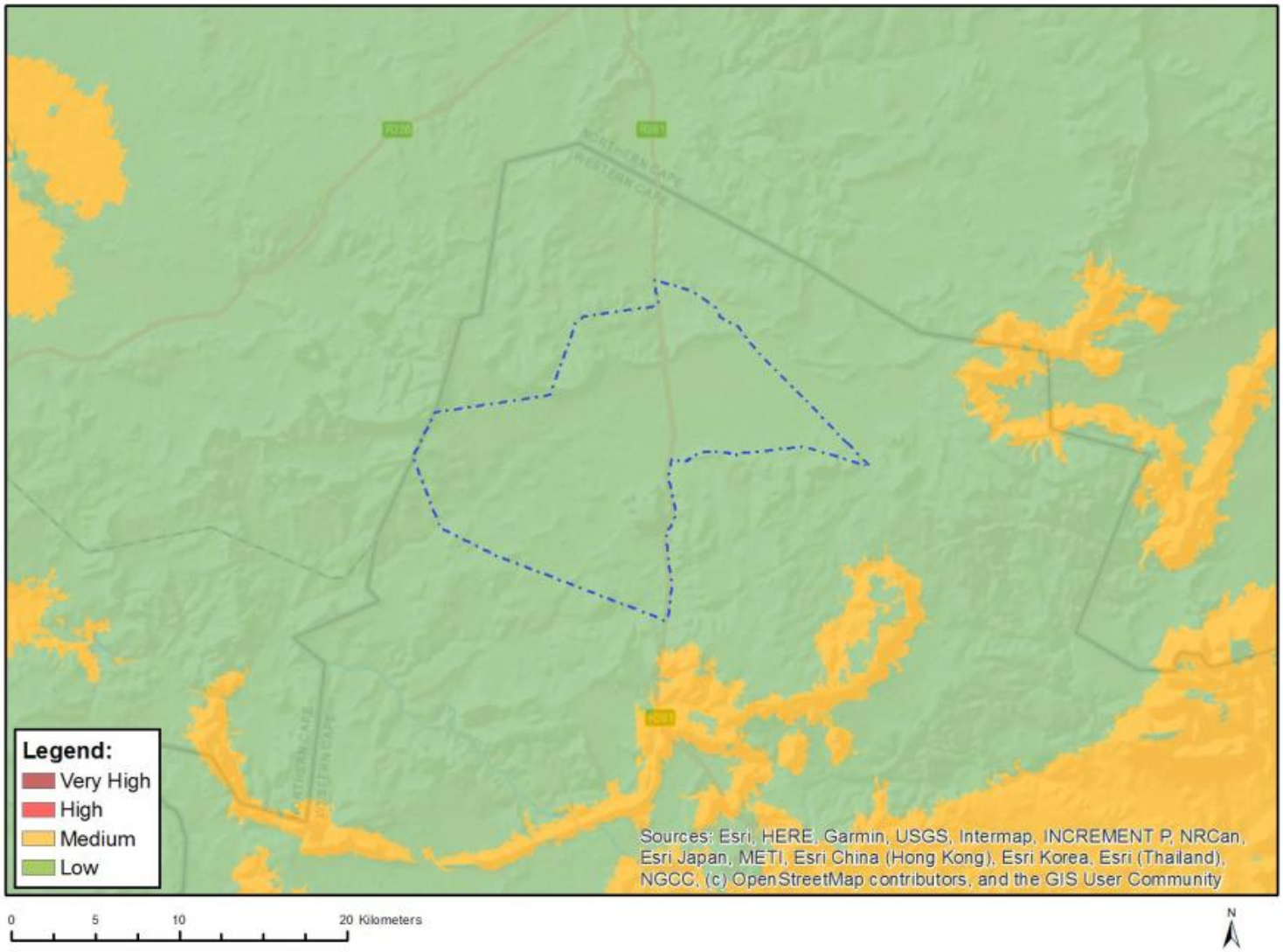


**Figure 3.** Plant Species Theme Sensitivity Map

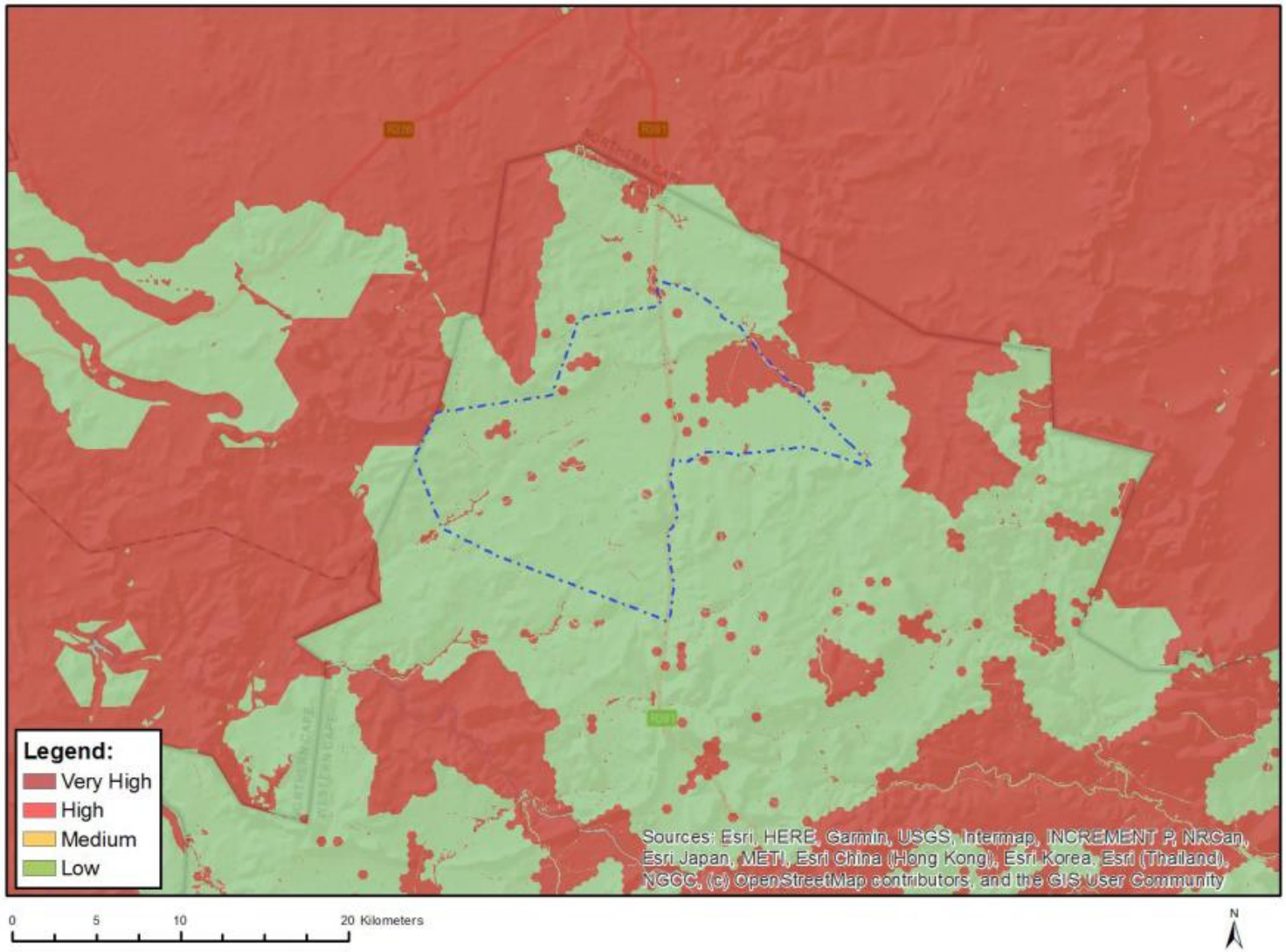


**Figure 4.** Terrestrial Biodiversity Theme Sensitivity Map

**Table 4.** Terrestrial Biodiversity Theme Features

| Sensitivity | Feature(s) |
|---|---|
| Low | Low Sensitivity |
| Very High | Ecological Support Area 2 |
| Very High | Ecological Support Area 1 |
| Very High | Critical Biodiversity Area 2 |
| Very High | Critical Biodiversity Area 1 |
| Very High | Freshwater ecosystem priority area quinary catchments |
| Very High | Focus Areas for land-based protected areas expansion |

Due to the fact that the site contains areas of High sensitivity in terms of the Animal Species Theme and Very High sensitivity in terms of the Terrestrial Biodiversity Theme, a Terrestrial Animal Species Impact Assessment and a Terrestrial Biodiversity Impact Assessment as outlined within the "*The Assessment And Reporting Of Impacts On Terrestrial Animal Species For Activities Requiring Environmental Authorisation*" and "*Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity*", respectively, must be undertaken and the protocols for these assessments should be followed. In terms of the Plant Species Protocol, since the site is located in a low sensitivity area, a terrestrial plant species compliance statement must be compiled.

# *3 DESCRIPTION OF THE AFFECTED ENVIRONMENT – HOOGLAND NORTH 2 WIND FARM*

## 3.1 VEGETATION TYPES

The national vegetation map (Mucina & Rutherford 2006 & SANBI 2018 update) for the study area is depicted below in Figure 5. The whole of the Hoogland North 2 site is classified as falling within the Eastern Upper Karoo vegetation type. This is clearly an oversimplification of the vegetation of the site and based on work on the adjacent Nuweveld Wind Farms as well as the on-site field assessment for the Hoogland Northern Wind Farm Cluster, there are extensive tracts of Upper Karoo Hardeveld at the site, as well as fairly extensive areas of riparian vegetation which would currently fall into the Bushmanland Vloere vegetation type but are more-closely allied to the Southern Karoo Riviere vegetation type. These three vegetation types are described and illustrated briefly below.

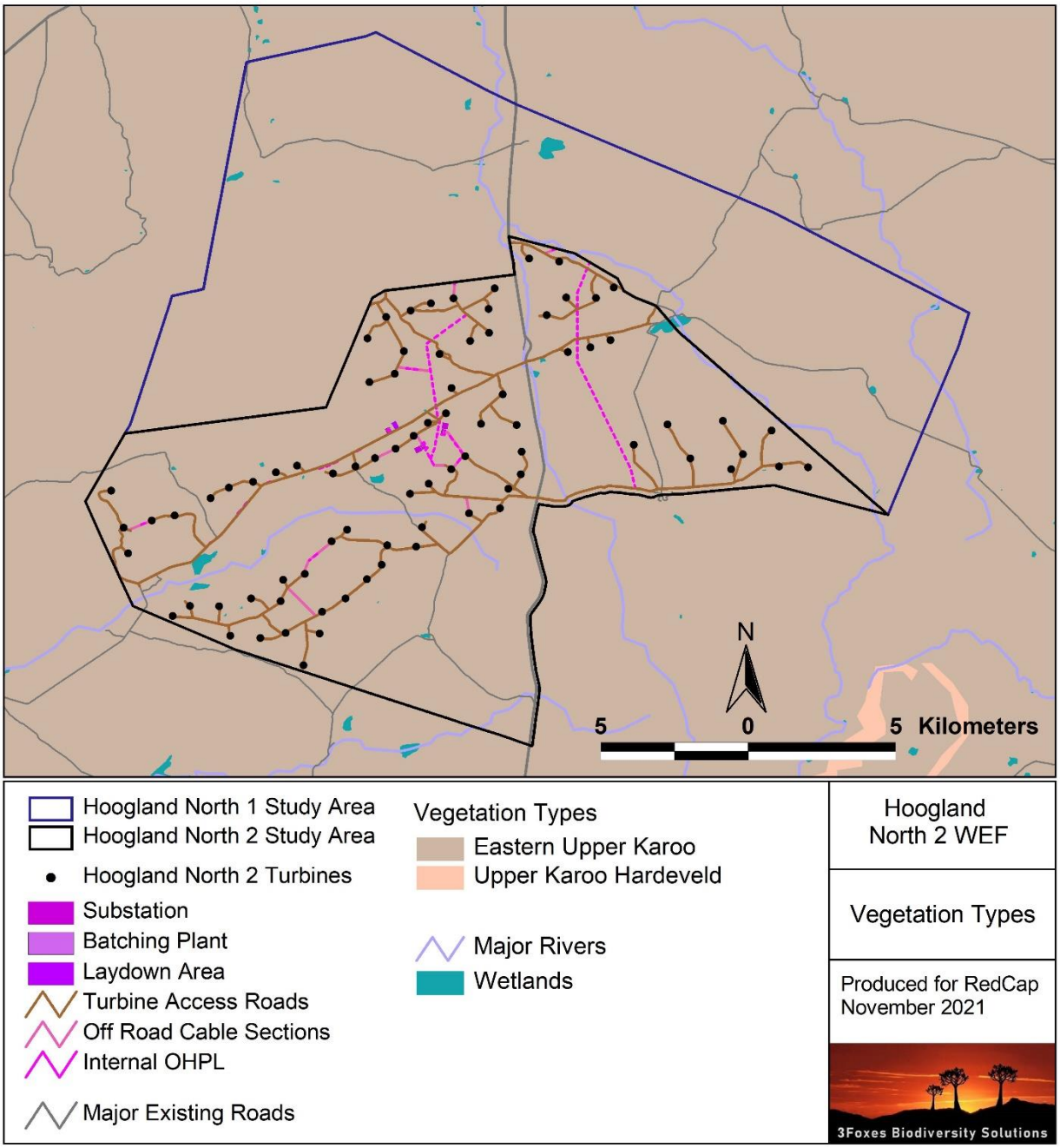


**Figure 5.** The national vegetation map (SANBI 2018 Update) for the Hoogland North 2 WEF and surrounding area, including the adjacent Hoogland North 1 WEF.

*Eastern Upper Karoo*

The whole of the Hoogland North 2 WEF site is mapped under the Vegmap as falling within the Eastern Upper Karoo vegetation type. Eastern Upper Karoo has an extent of 49 821 km$^2$ and is the most extensive vegetation type in South Africa and forms a large proportion of the central and eastern Nama Karoo Biome. This vegetation type is classified as Least Threatened, and about 2% of the original extent has been transformed largely for intensive agriculture. Eastern Upper

Karoo is however poorly protected and less than 1% of the 21% target has been formally conserved. Mucina & Rutherford (2006) list eight endemic species for this vegetation type, which considering that it is the most extensive unit in the country, is not very high. As a result, this is not considered to represent a sensitive vegetation type.

Within the study area, this is dominant vegetation type and forms the matrix in which the other vegetation units are embedded. There is however a fairly large degree of variation in the structure and composition of Eastern Upper Karoo within the site, driven largely by the substrate conditions, with the main differences being associated with dolerite-derived soils vs. shale and mudstone-derived soils. Overall, these tend to be represented by large tracts of fairly homogenous landscapes of low plant diversity. Dominant and characteristic species include low woody shrubs such as *Pentzia globosa*, *Rosenia humulis*, *Asparagus capensis*, *Eriocephalus ericoides*, *Pteronia sordida*, *Pteronia incana*, *Plinthus karooicus*, *Helichrysum luciloides*, *Felicia muricata*, with a varying density of low succulent shrubs such as *Zygophyllum lichtensteinii*, *Aridaria noctiflora* and *Ruschia spinosa*, with a variable grass layer dominated by *Stipagrostis ciliata*, *Stipagrostis obtusa*, *Enneapogon desvauxii* and *Tragus berteronianus.*

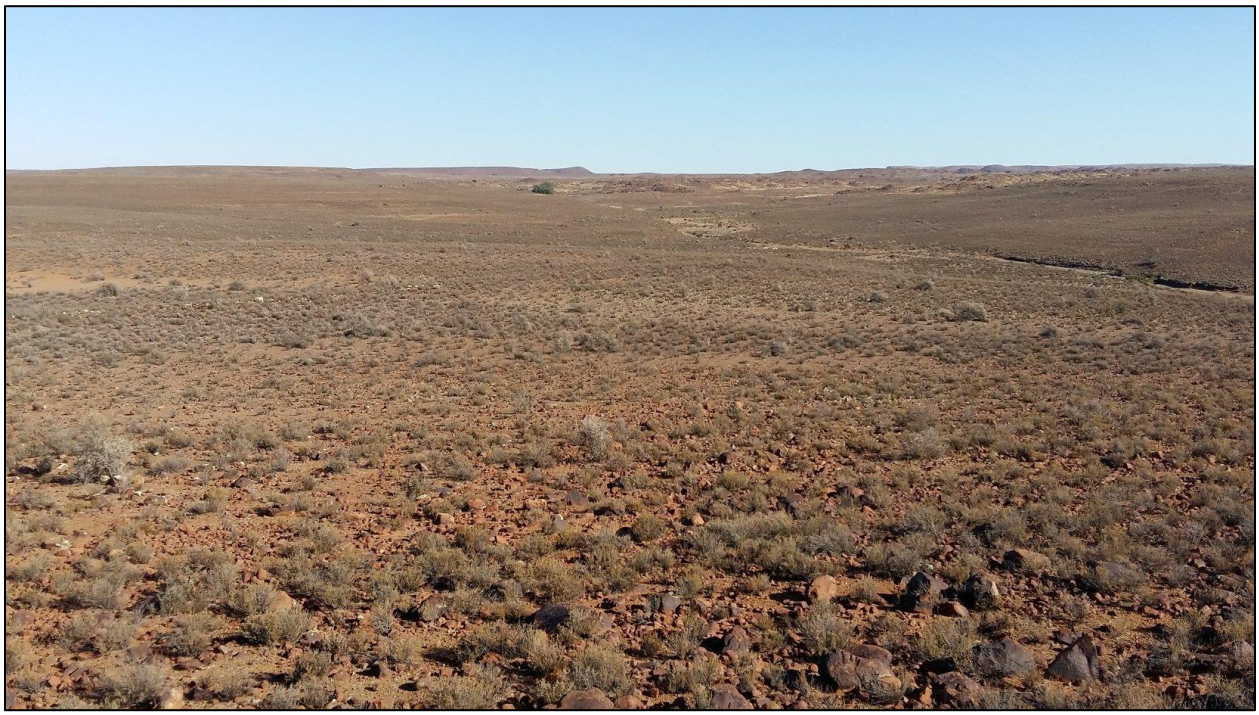

**Figure 6.** Typical open plains present in the Hoogland North 2 study area, corresponding with the Eastern Upper Karoo vegetation type. The typical plains of the study area are considered low sensitivity and considered suitable for wind farm development.

*Upper Karoo Hardeveld*

Although there are no areas mapped under the Vegmap as Upper Karoo Hardeveld within the site, the majority of dolerite hills within the site can be considered to represent this vegetation type. The Upper Karoo Hardeveld vegetation type is associated with 11 734 $km^2$ of the steep slopes of koppies, buttes mesas and parts of the Great Escarpment covered with large boulders and stones. The vegetation type occurs as discrete areas associated with slopes and ridges from Middelpos in the west and Strydenburg, Richmond and Nieu-Bethesda in the east, as well as most south-facing slopes and crests of the Great Escarpment between Teekloofpas and eastwards to Graaff-Reinet. Altitude varies from 1000-1900m. Mucina & Rutherford (2006) list 17 species known to be endemic to the vegetation type. This is a high number given the wide distribution of most karoo species and illustrates the relative sensitivity of this vegetation type compared to the surrounding Eastern Upper Karoo.

Most of the hills, outcrops and steep slopes within the Hoogland North site consist of Upper Karoo Hardeveld and this unit has been significantly under-mapped within the national vegetation map. This vegetation type usually consists of very rocky ground and is often associated with steep slopes, with the result that it is considered vulnerable to disturbance but is also an important habitat for fauna. It also contains a higher abundance of protected plant species than the adjacent areas of Eastern Upper Karoo. Consequently, it is generally considered higher ecological sensitivity than the surrounding areas. This habitat creates a wide variety of microhabitats for fauna and flora and the areas with large amounts of exposed rock have therefore been mapped as high sensitivity.

**Figure 7.** Dolerite ridge within the Hoogland North 2 site, with the Upper Karoo Hardeveld vegetation type. These areas are considered more sensitive than the surrounding plains as they create a wide variety of habitats for both fauna and flora.

*Southern Karoo Riviere*

Although not all areas associated with this vegetation type have been mapped in the VegMap, the vegetation along the major rivers within the site corresponds with the Southern Karoo Riviere vegetation type. To the north of the site, riparian areas are mapped as Bushmanland Vloere, but this is not an appropriate designation for these areas and the riparian areas within the site and within the upper Sak and Krom rivers more generally, corresponds better with the Southern Karoo Riviere vegetation type. The Southern Karoo Riviere vegetation type is associated with the rivers of the central karoo such as the Buffels, Bloed, Dwyka, Gamka, Sout, Kariega and Sundays Rivers. About 12% has been transformed as a result of intensive agriculture and the construction of dams. Although it is classified as Least Threatened, it is associated with rivers and drainage lines and as such represents areas that are considered ecologically significant. Common and dominant species in the drainage lines and within the adjacent floodplain vegetation include *Sporobolus ioclados*, *Helichrysum pentzioides*, *Drosanthemum lique*, *Pentzia globosa*, *Salsola aphylla*, *Tribulis terrestris*, *Felicia muricata*, *Atriplex vestita,* Zygophyllum retrofractum, Cynodon dactylon, Chrysocoma ciliate, Stipagostis namaquensis, Lycium pumilum, *Lycium cinereum*, *Artemisia africana*, *Tripteris spinescens*, *Exomis microphylla* and *Derverra denudata*.

Within the Hoogland North WEF area, there are some fairly well-developed drainage lines such as the Slangfontein se Rivier. However, the majority of these are within the the north and east of the Hoogland North 1 site, where there are floodplains along the drainage lines that have a composition and structure indicating that these areas favourable for Riverine Rabbit and to date,

Riverine Rabbits have been confirmed present at three locations within the Hoogland North 1 site. No Riverine Rabbits have been confirmed from within the Hoogland North 2 site as yet, although some of the observations are in close proximity to the boundary of the Hoogland North 2 and the buffers applied to these areas of favourable habitat extend to within the Hoogland North 2 site.

**Figure 8.** Example of riparian vegetation present within the Hoogland North site, with plant species present that indicate that these areas represent favourable habitat for Riverine Rabbits.

### *LISTED PLANT SPECIES*

As many as 18 red-listed plant species are known from the broad area around the Hoogland North 2 Wind Farm. The listed species known from the area are provided in Table 5 below. Investigation of the list however reveals that at least 6 of these are erroneous and included on the list due to outdated taxonomy and do not in fact occur in the vicinity of the site (Species have been split into several different species or they were incorrectly identified at the time). Of the remainder, about half have a reasonable probability of occurring at the site or in the general broader area, although none of these species have been observed to date on the Hoogland site or the previously investigated adjacent Nuweveld Wind Farms site. There are however some habitats present within the Hoogland North site that are considered noteworthy and require more detailed investigation, in particular, there are numerous mudstone slopes and areas of exposed bedrock within the Hoogland North site that appear to have a distinct vegetation composition and which may have some plant of concern. There are also numerous provincially protected species present on the site including all *Aloe* species present, all *Amaryllidaceae*, all *Asclepiadaceae*, all

*Iridaceae*, all *Mesembryanthemaceae* and any other species as listed in the Western Cape Nature Laws Amendment Act, 2000.

**Table 5**. Listed plant species known from the broad area around the Hoogland North site. Not all of these species would occur within the affected area.

| Family | Species | Status | Probability |
|---|---|---|---|
| GERANIACEAE | *Pelargonium chelidonium* | EN | V.Low |
| ASPHODELACEAE | *Kniphofia ensifolia* subsp. *autumnalis* | EN | Incorrect ID |
| MESEMBRYANTHEMACEAE | *Sceletium expansum* | VU | Incorrect ID |
| ROSACEAE | *Cliffortia arborea* | VU | Not Present |
| ASPARAGACEAE | *Asparagus stipulaceus* | NT | Incorrect ID |
| ASTERACEAE | *Gnaphalium declinatum* | NT | Incorrect ID |
| GERANIACEAE | *Pelargonium exhibens* | NT | Moderate |
| AMARYLLIDACEAE | *Gethyllis longistyla* | Rare | High |
| ASTERACEAE | *Phymaspermum schroeteri* | Rare | Possible |
| CRASSULACEAE | *Adromischus humilis* | Rare | Possible |
| FABACEAE | *Lotononis azureoides* | Rare | Low |
| LOBELIACEAE | *Lobelia eckloniana* | Rare | Incorrect ID |
| MALVACEAE | *Anisodontea malvastroides* | Rare | Low |
| ASTERACEAE | *Cineraria lobata* subsp. *lobata* | Declining | Moderate |
| APOCYNACEAE | *Duvalia angustiloba* | DDD Revised to LC | High |
| APIACEAE | *Annesorhiza filicaulis* | DDT | Incorrect ID |

## 3.2 FAUNAL COMMUNITIES

### *Mammals*

As many as 70 mammals are listed for the wider study area in the MammalMap database, but many of these are introduced or conservation dependent and approximately 48 can be considered to be free-roaming and potentially impacted by the development (Annex 2). This includes several red-listed species including the Riverine Rabbit *Bunolagus monticularis* (CR), Black-footed Cat *Felis nigripes* (VU), Grey Rhebok *Pelea capreolus* (NT), Mountain Reedbuck *Redunca fulvorufula* (EN) and Brown Hyena *Hyaena brunnea* (NT). Based on the camera trapping conducted on the adjacent Nuweveld Wind Farms, the Mountain Reedbuck is confirmed present in the area, while it is highly likely that the Grey Rhebok is also present. Neither of these species have been detected within the Hoogland Northern site through camera trapping to date. The camera trapping has however picked up the Riverine Rabbit within the Hoogland North combined site and this species appears to be fairly common within suitable habitat across the Hoogland North 1 site but is likely to be marginally present or significantly less abundant within the Hoogland North 2 site.

A map indicating the locations of the observations in and around the site is shown below in Figure 9. The potential implications of the presence of the Riverine Rabbit at the site is further discussed below. In general, the mammalian community of the site is likely to be typical of the area and the preliminary camera trapping results available to date indicate that it is broadly similar to the adjacent Nuweveld WEF site. To date, the only species detected on the Hoogland Northern site that were not also detected on the Nuweveld site are the Riverine Rabbit and the Fallow Deer, the latter being an introduced species that is common in the high-lying mountains along the Great Escarpment.

In terms of the sensitivity mapping relating more generally to mammals, the riparian areas have been classified as Very High sensitivity based on their value as Riverine Rabbit habitat but also as a result of their general ecological significance. The rocky hills and steep slopes have been classified as Very High sensitivity on account of the value of these areas as habitat for mammals associated with rocky areas and the more general ecological value of these areas. While these features occupy a fairly large proportion of the site, the overall degree of conflict between the development and these areas appears to be fairly low. This results largely from changes to the initial layouts in response to the sensitivity mapping and the conscious avoidance of the more sensitive parts of the site.

**Table 6.** Red-listed mammals known from the broad area and their likely presence in the Hoogland Northern site and the likely consequence thereof.

| Species | Status | Likely Presence & Consequence | |
|---|---|---|---|
| | | **Wider Hoogland Northern Area** | **Hoogland North 2 WEF** |
| Riverine Rabbit *Bunolagus monticularis* | CR | Confirmed present in the area, especially along the R381 in the vicinity of the Sak River, but also in some areas along the Krom and these rivers' tributaries. | Confirmed present within the adjacent Hoogland North 1 site. Appears to be fairly common within suitable habitat. It is recommended that these areas are avoided as much as possible and buffered by at least 350m from turbines. Although there are some areas of potentially suitable habitat within Hoogland North 2, this species has not been confirmed present by the camera traps to date. |
| Black-footed Cat *Felis nigripes* (VU) | VU | There are historical records from the Hoogland area and it is considered to be possibly present within the Karoo National Park but not confirmed. | This is a secretive species and while it may be present in the area, this species was not detected by the camera traps on adjacent Nuweveld or the Hoogland North 2 site to date |

| | | | |
|---|---|---|---|
| | | | and it is not likely present within the site. |
| Grey Rhebok *Pelea capreolus* | NT | This species is confirmed present in the area and can commonly be seen in most areas of high-lying ground in the Karoo and along the Great escarpment. | Although this species has not been detected by the camera traps on either Hoogland North or Nuweveld WEF, it is present in the wider area and there is a reasonable probability that this species is present on the site. However, as this species has a wide distribution in the country, the wind farm is not likely to generate a significant impact on the local population of this species. |
| Mountain Reedbuck *Redunca fulvorufula* | EN | This species is confirmed present in the area, both within the Karoo National Park and more generally in the area, in high-lying areas with good grass cover. | This species was confirmed present on Nuweveld and while it has not yet been detected on Hoogland North, it is likely present in at least some parts of the Hoogland North site as well. But as for the Grey Rhebok, this species has a large range and it is not likely that the development would generate a large impact on this species. |
| Brown Hyena *Hyaena brunnea* | NT | This species occurs at a naturally low density within the Karoo and is known from a few records from the Karoo National Park but may also roam freely on farmland. | Although this species may pass through the area on occasion, it is considered unlikely to be present on the site on a regular basis. |

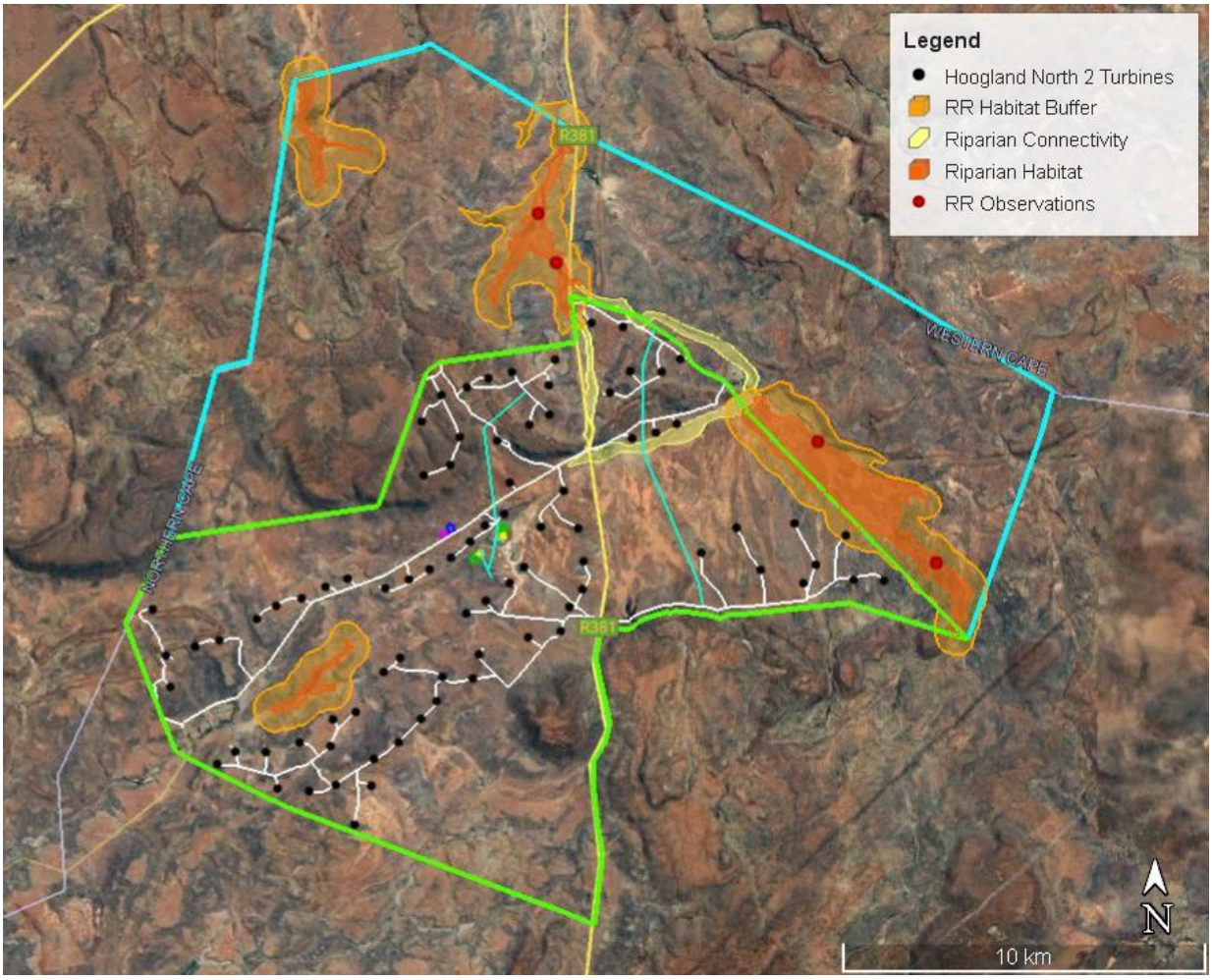


**Figure 9.** Map showing the location of Riverine Rabbit observations at the site, based on camera trapping results and in-field observations of Rabbits.

The Riverine Rabbit is potentially of concern for the Hoogland North 2 development. This species has been detected at four localities within the Hoogland North 1 site (Figure 9) and appears to have a high fidelity to specific riparian communities associated with the larger drainage systems of the site (Figure 10). The areas of potentially suitable habitat have been mapped in Figure 9 above and buffered by up to 500m depending on the landscape context and the potential for impact on Riverine Rabbit due to turbine noise and flicker. These buffers project into the Hoogland North 2 site and there is also an area of potential habitat in the west of the site where Rabbits have not been detected as yet. The primary habitat areas where Riverine Rabbit are confirmed present are disjunct and the drainage lines between the two areas of confirmed presence in the north east of the Hoogland North combined site are rocky with little riparian vegetation considered to be suitable habitat for this species. This suggests that Riverine Rabbit are not likely resident in these less suitable areas, but likely move between the areas of more extensive suitable habitat along these riparian corridors. In the west, the area of suitable habitat is along a riparian feature that drains west out of the site and hence is not linked to the other areas of observed habitat. The areas of suitable habitat have been buffered from turbines by up to

500m depending on the landscape context, with buffers reduced from 500m (but not less than 350m) only in areas with large ridges or similar topographic features that would shield the riparian areas from turbine noise. These buffers and corridor linkages between the major habitat patches have been integrated into the turbine no-go layer and this explicitly informs the location of turbines at the site. Within the layout provided for the current assessment, Turbine number 153 is located within the Riverine Rabbit buffer zone and it is recommended that this turbine is dropped from the layout or relocated to outside of the buffer zone. With this change in place, the development of the Hoogland North 2 WEF would not have a significant impact on the areas of Riverine Rabbit habitat as the few roads that would need to pass through these areas are along existing roads with the result that the additional habitat loss would be low. The extensive turbine buffers that have been implemented around the areas of habitat will ensure that noise and movement impacts related to turbines are significantly reduced. As the impacts of wind turbines on Riverine Rabbits or other fauna is not well known, it is recommended that pre- and post-construction monitoring be implemented to evaluate the response of Riverine Rabbits to wind farm development.

**Figure 10.** Riverine Rabbit captured by a camera trap within the Hoogland North 1 site. The black line along the jawline is one of the definitive features of this species. No Rabbits have have detected within the Hoogland North 2 site as yet.

***Reptiles***

Reptile diversity in the wider area is relatively high which can be ascribed to the diversity of habitats present, especially along the Nuweveld escarpment south of the site. Based on the results of the adjacent Nuweveld Wind Farms study, which includes the contribution of the

Sungazer (2020) study, approximately 63 reptile species are known from the general region and may potentially occur within the study area, with 14 being of confirmed occurrence, 45 of probable occurrence and four of possible occurrence. Species of potential concern include the local endemic, Braack's Pygmy Gecko and the Karoo Padloper. Braack's Pygmy Gecko *Goggia braacki* is a Western Cape endemic with an extremely restricted distribution range. Most of its distribution is associated with a section of the Hoogland Mountains range within the Karoo National Park. It is however not currently red-listed, but it can perhaps be regarded as the reptile icon for the Hoogland/Beaufort West region. It has thus far, not been recorded in the Hoogland Wind Farms study area, but it may possibly (not probably) be present within the wind farm area. The only threatened (Red Listed) reptile species in this region is the Karoo Padloper (EN). This small tortoise is seldom observed, even when specifically targeted during herpetofaunal surveys as it is active for only very short parts of the day and may also aestivate for extended periods during unfavourable environmental conditions. They are associated with dolerite ridges and rocky outcrops of the southern Succulent and Nama Karoo biomes. Threats to this species include habitat degradation due to agricultural activities and overgrazing, and predation by the Pied Crows which in recent decades have expanded in distribution range. There is certainly suitable habitat within the Hoogland North 2 site and the shell of a putative Padloper (definitive features such as the number of toes were not visible, so the identification is not conclusive) that had fairly recently been predated was observed on one of the ridges in the east of the combined Hoogland North site (Figure 11). Fortunately, tortoises are one of the few groups of reptiles that have been specifically studied with regards to their responses to wind energy development and no significant negative impacts have been detected within population's resident on wind farms (Agha *et al*. 2015, Lovich *et al*. 2011). Consequently, habitat loss for this species is likely to be the major avenue of potential impact resulting from the wind farm development. Specific attention to potential habitat loss for this species was paid during the sensitivity mapping and all areas which represent highly favourable habitat for this species have been mapped as no-go areas for turbines. There would however, still be some impact on the smaller ridges due to turbines and access roads and hence some degree of habitat loss for this species.

**Figure 11.** Recently predated remains of a putative Karoo Padloper shell observed on one of the ridges in the east of the combined Hoogland North site.

***Amphibians***

The diversity of amphibians in the study area is relatively low with only 11 species having being recorded in the area. Species observed at the vicinity of the Hoogland site include the Karoo Toad, Clawed Toad and Poynton's River Frog. There are no listed amphibian species known from the area although the Giant Bull Frog *Pyxicephalus adspersus* was previously listed as Near Threatened but has revised to Least Concern. This species is associated with temporary pans in the Karoo, Grassland and Savannah Biomes, but is not commonly recorded in the study area and its presence at the site is considered unlikely. Within the site, there are several drainage lines that would have temporary pools that can be used by toads and frogs for seasonal breeding purposes. But given that these areas are considered important for Riverine Rabbits and other ecological considerations, areas important for amphibians are captured through other sensitivities and there are no areas that would need to be avoided on specific account of amphibians. Given the localised nature of important amphibian habitats at the site as well as the generally arid nature of the site and the low overall abundance of amphibians, a significant long-term impact on amphibians is unlikely.

## 3.3 CRITICAL BIODIVERSITY AREAS & BROAD-SCALE PROCESSES

There is only one significant contiguous area of CBA located within the east of the Hoogland North 2 site (Figure 12). Under the indicative layout for Hoogland North 2 WEF, there are no turbines within this area or any of the other smaller CBAs within the site, although there is an access road that traverses one of the CBAs. Given the avoidance of the larger CBAs, impacts on the CBAs would be low and restricted to a small amount of habitat loss. All of the minor drainage systems and washes (minor drainage features without well-developed riparian vegetation) of the site are

mapped as ESAs and as it is not possible to avoid these features, there would be some impact on these minor features, largely through habitat loss and disturbance associated with the access roads of the development. However, with the appropriate mitigation, impacts on the ESAs would be relatively low and considered acceptable. The ESAs are small and represent buffers along the minor drainage features of the site and as such do not represent broad-scale corridors or ecological gradients that would potentially be disrupted by the development.

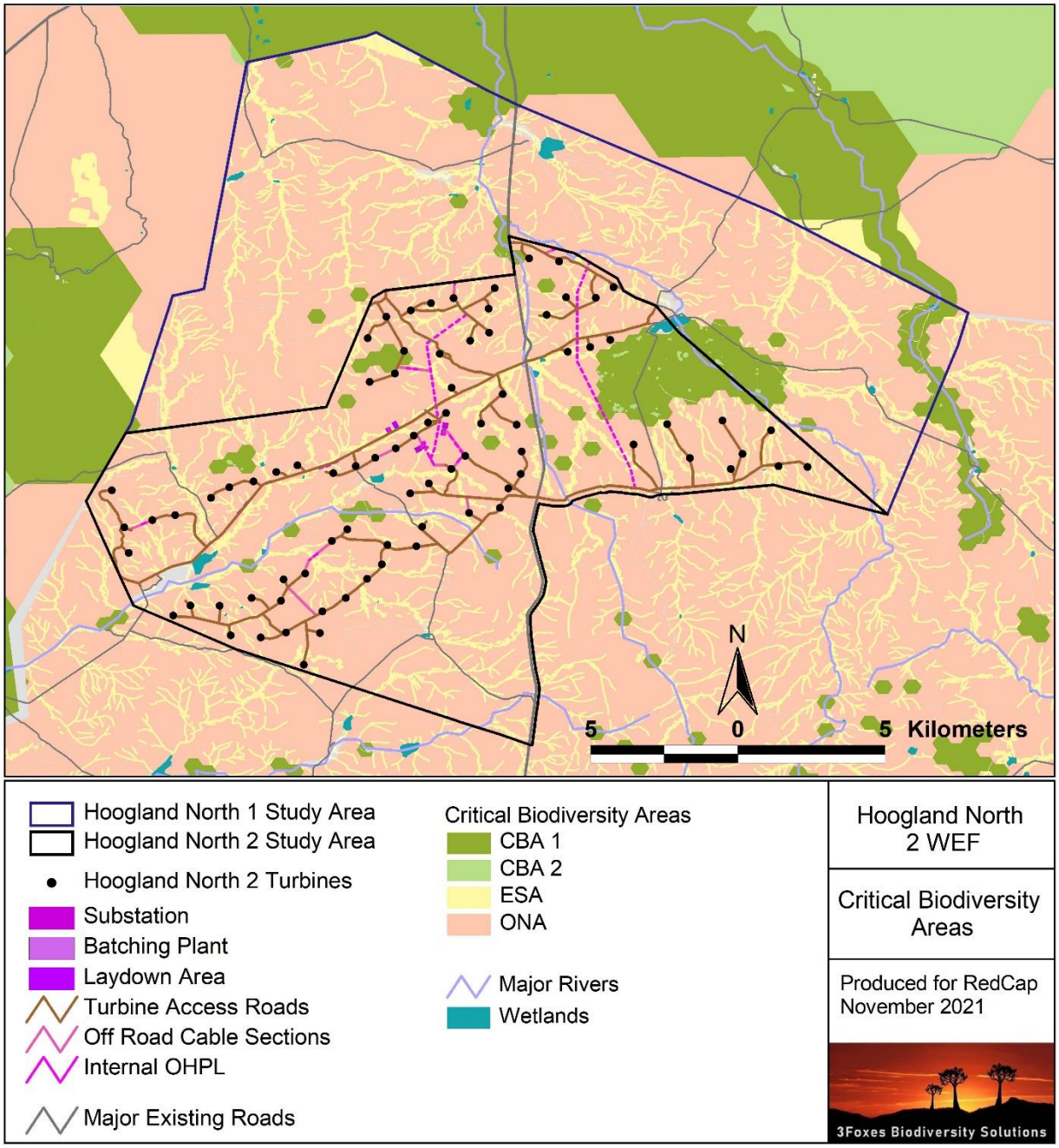


**Figure 12.** Extract of the Western Cape Biodiversity Spatial Plan and Northern Cape CBA map for the Hoogland North 2 study area, showing that there is a single extensive CBA within the east of the site, which has not been impacted by the current development layout.

### 3.4 CUMULATIVE IMPACTS

Where other renewable energy developments occur within 30km of a site, a cumulative impact assessment is required. This includes a general assessment of cumulative impact as well as an assessment of different potential cumulative impact sources and an indication of the size or extent of the identified cumulative impact.

In terms of cumulative impacts in and around the Hoogland North 2 site, there are no existing wind farms in the area, although there are several approved facilities in the broad area, most notably the Nuweveld suite of projects immediately south of the site, with an approximate footprint of 300ha. Apart from the above facilities, the current suite of Hoogland North projects which includes the Hoogland North 1 and Hoogland North 2 Wind Farm projects would have an approximate permanent footprint of 150ha each. To the south there are also the two Hoogland Southern Wind Farm projects that would have an estimated permanent combined footprint of 200ha. As such, the total potential footprint from wind energy development in the vicinity of the Hoogland North 2 project would be approximately 500-600ha. The Hoogland North 1 facility would contribute an additional 126ha to this total. Of greatest likely concern would be the concentration of wind energy developments in the Hoogland Northern area as this project is contiguous with the three Nuweveld Wind Farms and as such would potentially result in five contiguous wind farms. In terms of specific cumulative impacts, impacts on the Riverine Rabbit would be a concern, but since this species was not detected in the Nuweveld Wind Farms, cumulative impacts on this species would be restricted to the Hoogland suite of projects. As the broader area is still largely intact with no existing renewable energy facilities present, cumulative impacts associated with the current project are considered acceptable.

## *4 HOOGLAND NORTH 2 WIND FARM CONSTRAINTS*

The constraints/sensitivity map (for turbines) for the Hoogland Northern Wind Farm area is depicted below in Figure 13. There are numerous constraints operating across the site, associated largely with the drainage features of the area, Riverine Rabbit habitat and their associated applied buffers and also the steep slopes and dolerite outcrops of the site. Although these occupy a significant proportion of the site, there are also extensive open plains and low hills present across the site that are considered low to moderate sensitivity and which are suitable for wind energy development. Under the preliminary turbine layout provided, it is only Turbine 153 that lies within a turbine no-go area associated with a Riverine Rabbit buffer area. It is recommended that this turbine is either dropped from the layout or relocated to outside of the no-go area.

In terms of the roads no-go layer (Figure 14), these are largely similar to the turbine no-go layer but somewhat less constrained in terms of the drainage lines and somewhat more constrained in terms of slopes. Ultimately, it is the roads that generate the largest proportion of habitat loss

associated with wind farms and as such, are the primary drivers of habitat loss within the affected area and the sensitivity mapping takes specific account of sensitive areas potentially associated with the Karoo Padloper as well as avoiding areas of rugged terrain and steep slopes where the construction of the roads would generate a lot of cut and fill or increase erosion potential of disturbance within sensitive habitats. In terms of the initial layout, there are no roads within areas that are considered no-go areas. The scale of the sensitivity map as depicted below does not allow for clear interrogation of the roads and observation of the extent to which these avoid the no-go areas. Overall, the road layer is considered acceptable and would generate low to moderate impacts on fauna and flora.

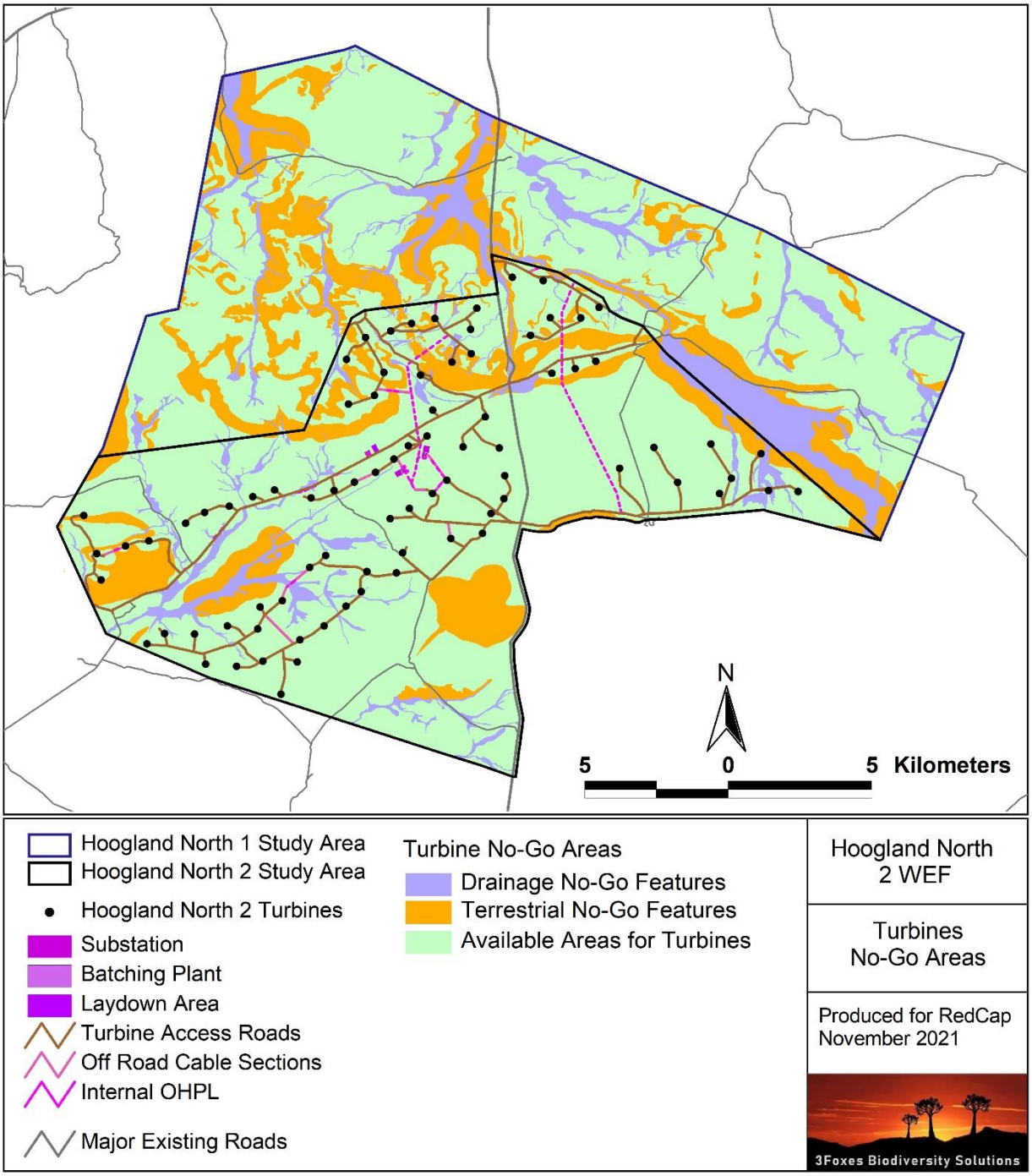


**Figure 13.** Ecological constraints map for turbines on the Hoogland North 2 Wind Farm site.

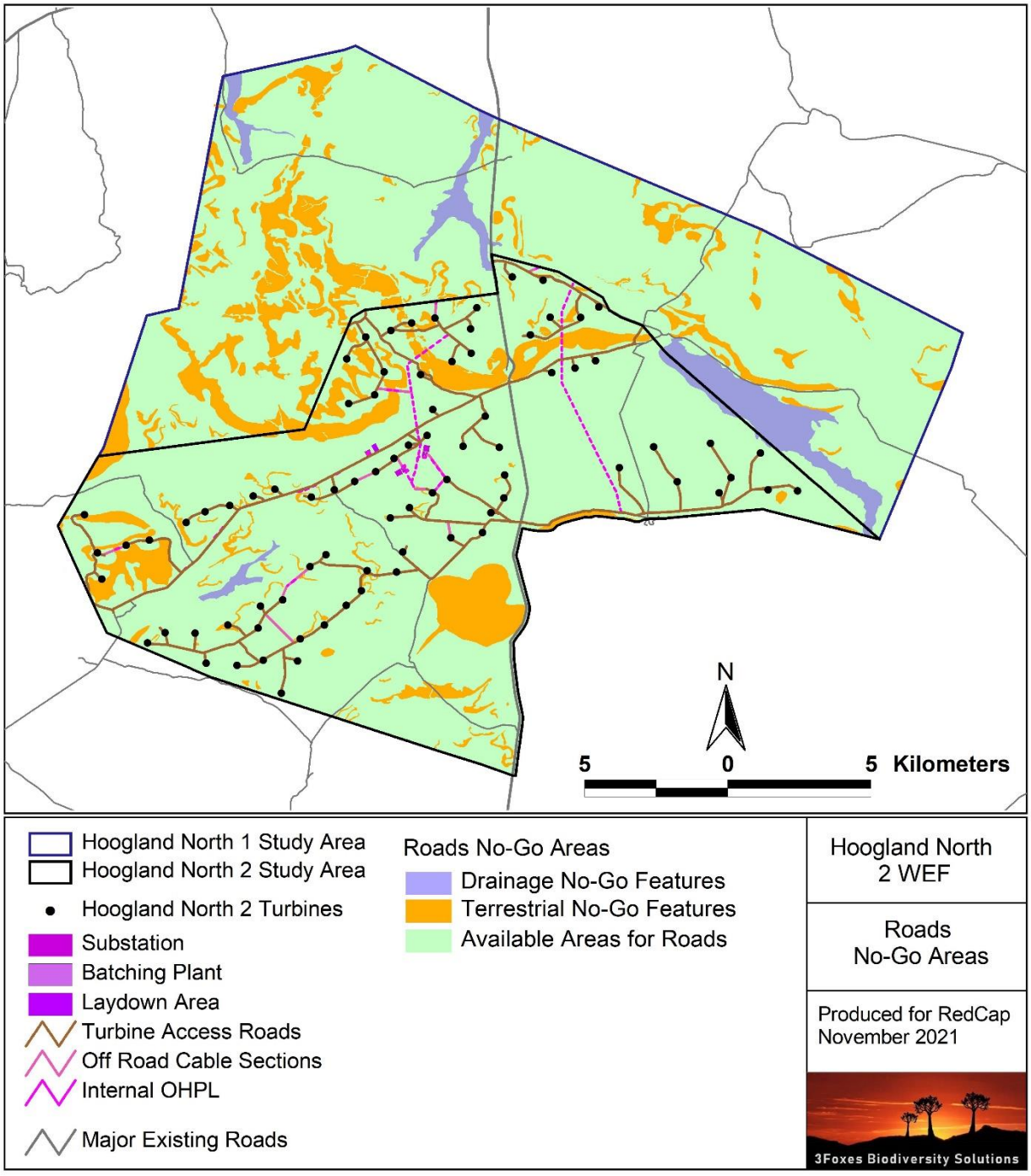


**Figure 14.** Ecological constraints map for roads on the Hoogland North 2 Wind Farm site.

# *5 IMPACTS AND ISSUES IDENTIFICATION*

## 5.1 IDENTIFICATION OF POTENTIAL IMPACTS

The development of the Hoogland North 2 Wind Farm is likely to result in a variety of impacts, associated largely with the disturbance, loss and transformation of intact vegetation and faunal habitat during construction. During operation, the impacts would be reduced and restricted largely to potential noise impacts and occasional disturbance from operational activities. The following impacts are identified as the major impacts that are likely to be associated with the development of the Hoogland North 2 Wind Farm.

***Impact 1. Impacts on vegetation and listed or protected plant species***

The development would require vegetation clearing for turbines, roads, underground cabling and substations with associated battery facility, as well as for temporary site camp and general laydown areas. In addition, it is likely that the turbine foundations and some roads would require blasting which would generate dust and debris fallout near these locations. Apart from the direct loss of vegetation within the development footprint, listed and protected species are likely to be impacted. These impacts would occur during the construction phase of the development, with additional vegetation impacts during operation likely to be low. Although the abundance of plant species of concern appears to be relatively low, there are numerous provincially protected species present.

***Impact 2. Direct Faunal Impacts***

Increased levels of noise, pollution, disturbance and human presence during construction will be detrimental to fauna. Sensitive and shy fauna are likely to move away from the area during the construction phase as a result of the noise and human activities present, while some slow-moving species would not be able to avoid the construction activities and might be killed if proper management and monitoring is not in place. Traffic at the site during all phases of the project would pose a risk of collisions with fauna. Slower types such as tortoises, snakes and certain mammals would be most susceptible, and the impact would be largely concentrated to the construction phase when vehicle activity is high. Some mammals and reptiles would be vulnerable to illegal collection or poaching during the construction phase as a result of the large number of construction personnel that are likely to be present.

***Impact 3. Impact on the Riverine Rabbit***

The Riverine Rabbit is confirmed present within the combined Hoogland North site, with the result that it is likely that there would be some degree of impact on this species, at least along the margins of the Hoogland North 2. During construction, the increased levels of traffic at the site would increase collision risk with rabbits, which is a known major cause of mortality for this species. Furthermore, the noise and disturbance associated with construction may deter rabbits from the affected areas where these are in close proximity to areas where Rabbits are present. During operation, impacts would be reduced, but noise from the turbines would potentially impact this species, resulting in local habitat degradation within and adjacent to the site. The habitat

degradation would result largely from turbine noise which is likely to reduce the ability of fauna such as Riverine Rabbits to hear their predators, with the result that the habitat becomes less favourable overall for species vulnerable to predation.

***Impact 4. Impact on Mammalian Fauna of Concern***

There are likely to be several other listed species present on the site apart from the Riverine Rabbit, including at very least the Mountain Reedbuck and Grey Rhebok. These species would experience habitat loss due to construction of turbines, roads and other infrastructure. During operation, impacts would likely be reduced, but noise from the turbines could potentially impact these species, resulting in local habitat degradation within the site. Habitat degradation from turbine noise would result in a reduced ability of fauna to detect their predators or their prey with the result that noise-affected areas have reduced habitat quality for affected species.

***Impact 5. Impact on the Karoo Padloper***

The Karoo Padloper would potentially experience habitat loss due to construction of turbines, roads and other infrastructure as well as an increased risk of poaching or illegal collecting. During operation, impacts would likely be reduced to some residual habitat loss as evidence from other parts of the world indicates that the operation of wind turbines does not appear have a significant impact on the health and adundance of tortoises within operational wind farms in similar arid regions (Agha et al. 2015, Lovich et al. 2011 ).

***Impact 6. Increased Erosion Risk***

The large amount of disturbance created during construction would leave the affected areas vulnerable to wind and water erosion. Some parts of the site are steep and specific mitigation and avoidance would be necessary to reduce this impact to acceptable levels. This impact is also of concern given the significance of the drainage lines in the area as Riverine Rabbit habitat and the consequent need to prevent and limit impact on these features.

***Impact 7. Impacts on CBAs and broad-scale ecological processes***

Although the footprint within the CBAs would be low/negligible, there would be some habitat loss within the ESAs of the site. In addition, the development would cause general habitat fragmentation and pose some impact on broad-scale ecological processes in the area. These impacts cannot be well mitigated and there is likely to be some residual impact on broad-scale ecological processes.

***Impact 8. Cumulative Impacts***

The development of the Hoogland Northern Wind Farm Cluster would result in habitat loss and an increase in overall cumulative impacts on fauna and flora in the area. This would be in addition to the three phases of the Nuweveld Wind Farms, which would result in approximately 300ha of habitat loss. Although the area currently experiences a relatively low level of impact, there are numerous developments currently being planned in the area and it is highly likely that cumulative impacts are going to increasingly become a concern.

## *6 PRE-APPLICATION ASSESSMENT OF IMPACTS – HOOGLAND NORTH 2 WIND FARM*

A preliminary assessment of the likely significance of each impact identified above is made below for the Hoogland North 2 Wind Farm.

### 6.1 CONSTRUCTION PHASE IMPACT 1. IMPACTS ON VEGETATION AND PLANT SPECIES OF CONSERVATION CONCERN

| **Issue** | **Impacts on vegetation and plant SCC** | |
|---|---|---|
| **Description of Impact** | | |
| Impact on vegetation and plant SCC due to construction-phase habitat loss. | | |
| **Type of Impact** | Indirect | |
| **Nature of Impact** | Negative | |
| **Phases** | Construction | |
| **Criteria** | **Without Mitigation** | **With Mitigation** |
| **Intensity** | Low | Low |
| **Duration** | Long-term | Long-term |
| **Extent** | Local | Local |
| **Consequence** | Medium | Medium |
| **Probability** | Definite / Continuous | Possible/Frequent |
| **Significance** | Medium - | Low - |
| **Degree to which impact can be reversed** | The affected environment will not be able to recover from the impact - permanently modified | |
| **Degree to which impact may cause irreplaceable loss of resources** | The resource is not damaged irreparably or is not scarce | |
| **Degree to which impact can be mitigated** | Mitigation exists and will notably reduce significance of impacts. While there is some scope for avoidance of sensitive species and habitats, some vegetation loss is an inevitable consequence of development that cannot be avoided. | |
| **Mitigation actions** | | |

| | | |
|---|---|---|
| **The following measures are recommended**: | • Undertake a pre-construction walk through of the development footprint to refine the layout through micrositing of turbines, buildings, substation (and associated battery facility), access roads and internal roads where it impacts on SCC.<br>• Adhere to the sensitivity maps and limits of acceptable change provided within this assessment when determining the final layout of the Wind Farm and associated infrastructure.<br>• Existing roads or disturbance footprints should be used as far as possible and should especially be used through very high sensitive areas. Should access roads, internal cables and overhead lines traverse drainage lines and riparian areas which are classified as Very High sensitivity these should be microsited by a suitably qualified ecological and aquatic specialist before construction in that area starts to ensure any potential impacts are minimised.<br>• Develop an alien vegetation management plan, soil erosion management plan, revegetation and rehabilitation plan based on the site attributes and environmental constraints. | |
| **Monitoring** | | |
| **The following monitoring is recommended**: | • Ensure that all vegetation-related preconstruction permits, surveys and walk-throughs have been conducted prior to the commencement of construction activity.<br>• Monitoring of vegetation clearing during construction by the EO to ensure that any plant SCC within the development footprint area are translocated to safety where necessary. | |
| **Cumulative impacts** | | |
| **Nature of cumulative impacts** | The contribution of the Hoogland North 2 Wind Farm to cumulative impacts on vegetation and plant species of concern is considered low due to the current low levels of transformation in the area and the relatively low total footprint of the development. | |
| **Rating of cumulative impacts** | **Without Mitigation** | **With Mitigation** |
| | Medium - | Low - |

## 6.2 CONSTRUCTION PHASE IMPACT 2. DIRECT AND INDIRECT FAUNAL IMPACTS

| | | |
|---|---|---|
| **Issue** | **Direct and indirect faunal impacts** | |
| **Description of Impact** | | |
| Increased levels of noise, pollution, disturbance and human presence during construction will be detrimental to fauna. Sensitive and shy fauna are likely to move away from the area during the construction phase as a result of the noise and human activities present, while some slow-moving species would not be able to avoid the construction activities and might be killed. | | |
| **Type of Impact** | Indirect | |
| **Nature of Impact** | Negative | |
| **Phases** | Construction | |
| **Criteria** | **Without Mitigation** | **With Mitigation** |
| **Intensity** | High | High |
| **Duration** | Short-term | Short-term |

| | | |
|---|---|---|
| **Extent** | Local | Local |
| **Consequence** | Medium | Medium |
| **Probability** | Definite / Continuous | Possible / frequent |
| **Significance** | Medium - | Low - |
| **Degree to which impact can be reversed** | The affected environment will be able to recover from the impact. While there is some scope for avoidance of sensitive habitats, some disturbance and habitat loss for fauna is an inevitable consequence of development that cannot be entirely avoided. | |
| **Degree to which impact may cause irreplaceable loss of resources** | The resource is not damaged irreparably or is not scarce | |
| **Degree to which impact can be mitigated** | Mitigation exists and will notably reduce significance of impacts | |
| **Mitigation actions** | | |
| **The following measures are recommended**: | • Adhere to the development restrictions placed on areas of Very High sensitivity. Where necessary, these areas include areas of high fauna importance.<br>• All vehicles should adhere to a low speed limit on site. Heavy vehicles should be restricted to 30km/h and light vehicles to 40km/h.<br>• All laydown areas, construction sites etc with waste disposal bins, should be provided with lockable bins that are tamper proof by baboons, monkeys and other fauna.<br>• Search and rescue for reptiles and other vulnerable species during construction, before areas of intact vegetation are cleared. Such search and rescue should be conducted by relevant experts with experience in search and rescue of the faunal groups concerned.<br>• Limiting access to the site and ensuring that construction staff and machinery remain within the demarcated construction areas during the construction phase.<br>Environmental induction for all staff and contractors on-site.<br>• Develop an open space management plan as part of the project EMPr.<br>• No excavated holes or trenches should be left open for extended periods as fauna may fall in become trapped.<br>• The design should ensure that there are no electrical fencing around substations (and associated battery facility) or other features within 20cm of the ground as tortoises become stuck against such fences and are electrocuted to death. | |
| **Monitoring** | | |
| **The following monitoring is recommended**: | • Ensure that all fauna-related preconstruction permits, surveys and walk-throughs have been conducted prior to the commencement of construction activity.<br>• Monitoring of site clearing during construction by the EO to ensure that any fauna remaining within the development footprint area are translocated to safety where necessary. Monitoring of construction activities to ensure that the development remains within the demarcated development footprint.<br>• Holes and trenches that are open should be checked on a regular basis (preferably daily) to ensure that any fauna that have fallen in and become trapped can be rescued to safety. | |

| Cumulative impacts | | |
|---|---|---|
| **Nature of cumulative impacts** | The development would result in some disturbance of fauna during the construction phase which would occur in addition to other faunal disturbance occurring in the area. However, as the area is largely undeveloped, larger fauna would be able to move away from disturbance during construction and return thereafter. However, the current development would contribute approximately 130ha to long-term habitat loss in the area. However, given the largely intact nature of the area, this is considered a relatively low contribution that would be acceptable. | |
| **Rating of cumulative impacts** | **Without Mitigation** | **With Mitigation** |
| | Medium - | Low - |

## 6.3 CONSTRUCTION PHASE IMPACT 3. CONSTRUCTION PHASE IMPACTS ON RIVERINE RABBITS

| **Issue** | **Construction phase impact on the Riverine Rabbit** | |
|---|---|---|
| **Description of Impact** | | |
| Impacts on Riverine Rabbit as a result of construction phase activities, including vehicle collisions, disturbance and habitat loss. | | |
| **Type of Impact** | Indirect | |
| **Nature of Impact** | Negative | |
| **Phases** | Construction | |
| **Criteria** | **Without Mitigation** | **With Mitigation** |
| **Intensity** | High | High |
| **Duration** | Medium-term | Short-term |
| **Extent** | Regional | Regional |
| **Consequence** | High | Medium |
| **Probability** | Conceivable | Conceivable |
| **Significance** | Medium | Low - |
| **Degree to which impact can be reversed** | The affected environment will only recover from the impact with significant intervention | |
| **Degree to which impact may cause irreplaceable loss of resources** | The resource is irreparably damaged and is not represented elsewhere | |
| **Degree to which impact can be mitigated** | Mitigation exists and will notably reduce significance of impacts | |

| Mitigation actions | | |
|---|---|---|
| **The following measures are recommended**: | • All construction vehicles should adhere to a low speed limit (30km/h on site and 40km/h) in areas where Riverine Rabbits are likely to be active, both within the wind farm as well as on the public roads to the site.<br>• During construction, driving between sunset and sunrise should be reduced as far possible as this is when Riverine Rabbits are most active and the risk of collisions is highest.<br>• No dogs should be allowed on site and precautions to ensure that there is poaching or other direct faunal disturbance on site should be implemented.<br>• Where any new roads, cabling and/or overhead lines traverse areas mapped as High Riverine Rabbit habitat sensitivity, the route should be microsited by a suitably qualified ecological specialist before construction commences to ensure any potential impacts are minimised. Existing tracks through these areas should be used where present. | |
| **Monitoring** | | |
| **The following monitoring is recommended**: | • There should be a monitoring programme for Riverine Rabbit roadkill during construction that should be used to inform any additional mitigation and avoidance that should be implemented. Should rabbits be killed by traffic, then the traffic management to and from the site should be reviewed in collaboration with the EWT Drylands Programme, to identify additional mitigation and avoidance that should be implemented to further reduce roadkill.<br>• Ensure that riparian areas near to the development footprint are clearly demarcated as no-go areas with appropriate signage and barriers. | |
| **Cumulative impacts** | | |
| **Nature of cumulative impacts** | The development would contribute to cumulative impacts on Riverine Rabbits especially due to vehicle collisions, but this would be transient and the overall contribution to cumulative impact would be low. | |
| **Rating of cumulative impacts** | **Without Mitigation** | **With Mitigation** |
| | Medium - | Low - |

## 6.4 CONSTRUCTION PHASE IMPACT 4. CONSTRUCTION PHASE IMPACTS ON FAUNA SCC

| **Issue** | **Construction phase impact on the Fauna SCC such as Mountain Reedbuck and Grey Rhebok** |
|---|---|
| **Description of Impact** | |
| Impacts on species such as Mountain Reedbuck and Grey Rhebok as a result of construction phase activities, including noise, disturbance and habitat loss. | |
| **Type of Impact** | Indirect |
| **Nature of Impact** | Negative |

| Phases | Construction | |
|---|---|---|
| **Criteria** | **Without Mitigation** | **With Mitigation** |
| **Intensity** | High | High |
| **Duration** | Medium-term | Short-term |
| **Extent** | Local | Local |
| **Consequence** | Medium | Medium |
| **Probability** | Probable | Possible / frequent |
| **Significance** | Medium - | Low - |
| **Degree to which impact can be reversed** | Mitigation exists and will notably reduce significance of impacts | |
| **Degree to which impact may cause irreplaceable loss of resources** | The affected environment will only recover from the impact with significant intervention | |
| **Degree to which impact can be mitigated** | Mitigation exists and will notably reduce significance of impacts | |
| **Mitigation actions** | | |
| **The following measures are recommended**: | • No dogs should be allowed on site and precautions should be implemented to ensure that there is poaching or other direct faunal disturbance on site. | |
| **Monitoring** | | |
| **The following monitoring is recommended**: | • If any parts of the site are found to be of high importance for these species, some avoidance of these areas may be required. This would still need to be determined through the on-going camera trapping that is underway at the site.<br>• Monitoring of construction activities to ensure that potential impacts on fauna SCC are reduced as far as possible. This should include monitoring of personell activities to reduce poaching potential, noise, littering and general disturbance. | |
| **Cumulative impacts** | | |
| **Nature of cumulative impacts** | The development would contribute to cumulative impacts on fauna SCC, but this would be transient and the overall contribution to cumulative impact would be low. | |
| **Rating of cumulative impacts** | **Without Mitigation** | **With Mitigation** |
| | Medium - | Low - |

## 6.5 CONSTRUCTION PHASE IMPACT 5. CONSTRUCTION PHASE IMPACTS ON THE KAROO PADLOPER

| **Issue** | **Construction phase impact on the Karoo Padloper** |
|---|---|
| **Description of Impact** | |
| Impact on the Karoo Padloper as a result of construction phase activities, including disturbance, poaching and habitat loss. | |
| **Type of Impact** | Indirect |
| **Nature of Impact** | Negative |
| **Phases** | Construction |

| Criteria | Without Mitigation | With Mitigation |
|---|---|---|
| **Intensity** | High | Medium |
| **Duration** | Medium-term | Short-term |
| **Extent** | Local | Local |
| | Medium | Medium |
| **Probability** | Probable | Possible / frequent |
| **Significance** | Medium - | Low - |
| **Degree to which impact can be reversed** | Mitigation exists and will notably reduce significance of impacts | |
| **Degree to which impact may cause irreplaceable loss of resources** | The affected environment will only recover from the impact with significant intervention | |
| **Degree to which impact can be mitigated** | Mitigation exists and will notably reduce significance of impacts | |
| **Mitigation actions** | | |
| **The following measures are recommended**: | • Avoidance of areas identified as potential Padloper habitat at the planning and design phase. This has been implemented via the sensitivity mapping which has included areas of likely potential habitat as high or very high sensitivity.<br>• Limiting access to areas outside the construction footprint during construction to ensure that poaching and similar impact is minimised.<br>• Search and rescue for the Padloper and other reptiles within the development footprint prior to clearing within areas that have been identified as potential habitat. | |
| **Monitoring** | | |
| **The following monitoring is recommended**: | • Monitoring of construction activities to ensure that potential impacts on the Padloper are reduced as far as possible. This should include monitoring of personell activities to reduce poaching potential, noise and general disturbance. | |
| **Cumulative impacts** | | |
| **Nature of cumulative impacts** | The development would contribute to cumulative impacts on the Padloper, but this would be transient and the overall long-term contribution to cumulative impacts on this species would be low. | |
| **Rating of cumulative impacts** | **Without Mitigation** | **With Mitigation** |
| | Medium - | Low - |

## 6.6 CONSTRUCTION PHASE IMPACT 6. IMPACT ON CBAS

| Issue | Impacts on Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) |
|---|---|
| **Description of Impact** | |
| Construction phase impact on CBAs and ESAs | |
| **Type of Impact** | Indirect |
| **Nature of Impact** | Negative |

| Phases | Construction | |
|---|---|---|
| **Criteria** | **Without Mitigation** | **With Mitigation** |
| **Intensity** | Low | Very Low |
| **Duration** | Long-term | Long-term |
| **Extent** | Local | Local |
| **Consequence** | Medium | Low |
| **Probability** | Conceivable | Conceivable |
| **Significance** | Low - | Very Low - |
| **Degree to which impact can be reversed** | The affected environment will only recover from the impact with significant intervention | |
| **Degree to which impact may cause irreplaceable loss of resources** | The affected environment will only recover from the impact with significant intervention | |
| **Degree to which impact can be mitigated** | Mitigation exists and will notably reduce significance of impacts. The footprint within CBAs is low and considered acceptable. The Low intensity pre-mitigation impacts are the result of avoidance of these features at the planning stage. | |
| **Mitigation actions** | | |
| **The following measures are recommended**: | • There are no turbines located in CBAs however CBAs should be avoided for roads as far as possible. The use of existing roads through these areas is considered acceptable. Therefore, the current layout is suitable in this regard.<br>• Should access roads, internal cables and overhead lines traverse drainage lines and riparian areas mapped as CBAs these should be microsited by a suitably qualified ecological and aquatic specialist before construction in that area starts to ensure any potential impacts are minimised<br>• Minimise the development footprint as far as possible, which includes locating temporary-use areas such as construction camps and lay-down areas in low sensitivity or previously disturbed areas. The current layout depicts that the substations, camps and lay-down areas are in low sensivity areas, and this is therefore acceptable.<br>• Avoid impact to restricted and specialised habitats such as pans, wetlands and rock pavements. The final development footprint to be authorised should be checked for such sensitive features in the field, such that there is a high degree of confidence that the final layout avoids such features so that significant changes to turbines or roads are not required at the preconstruction phase.<br>• Minimise the development footprint near watercourses and other ecologically significant features. | |
| **Monitoring** | | |
| **The following monitoring is recommended**: | • Monitoring of construction activities to ensure that the development footprint within CBAs is restricted to the authorised development footprint. | |
| **Cumulative impacts** | | |

| | | |
|---|---|---|
| **Nature of cumulative impacts** | As the total extent of habitat loss within CBAs within the site is very low, the potential for the Hoogland 2 Wind Farm to contribute to cumulative impacts on CBAs is also seen as being low. | |
| **Rating of cumulative impacts** | **Without Mitigation** | **With Mitigation** |
| | Low - | Low - |

## 6.7 OPERATIONAL PHASE IMPACT 1. IMPACTS ON FAUNA DURING OPERATION

| **Issue** | **Operational phase faunal impacts** | |
|---|---|---|
| **Description of Impact** | | |
| Operational phase impacts on fauna (Vehicle collision/disturbance/electrocutions) | | |
| **Type of Impact** | Indirect | |
| **Nature of Impact** | Negative | |
| **Phases** | Operation | |
| **Criteria** | **Without Mitigation** | **With Mitigation** |
| **Intensity** | Medium | Low |
| **Duration** | Long-term | Long-term |
| **Extent** | Local | Site |
| **Consequence** | Medium | Low |
| **Probability** | Possible / frequent | Conceivable |
| **Significance** | Low - | Low - |
| **Degree to which impact can be reversed** | The affected environment will be able to recover from the impact | |
| **Degree to which impact may cause irreplaceable loss of resources** | The resource is not damaged irreparably or is not scarce | |
| **Degree to which impact can be mitigated** | Mitigation exists and will notably reduce significance of impacts. Habitat loss and disturbance will persist for the lifetime of the facility. The habitat could be partly restored thereafter. | |
| **Mitigation actions** | | |
| **The following measures are recommended**: | • Adhere to the open space management plan which makes provision for the favourable management of the facility and the surrounding area for fauna.<br>• Appropriate design of roads and other infrastructure to minimise faunal impacts and allow fauna to pass over, through or underneath these features as appropriate.<br>• A log should be kept detailing and fauna-related incidences or mortalities that occur on site, including roadkill, electrocutions etc. These should be reviewed annually and used to inform operational management and mitigation measures. | |
| **Monitoring** | | |
| **The following monitoring is recommended**: | • Monitoring of any fauna-related mortalities from roadkill or other sources at the site.<br>• Monitoring of any fauna-related conflicts at the site such as problems with baboons or Vervet monkeys. | |

| Cumulative impacts | | |
|---|---|---|
| **Nature of cumulative impacts** | Cumulative impacts on fauna are predicted to be low because there are no fauna species of high conservation concern that are likely to be compromised by the development and habitat loss in general would be low. | |
| **Rating of cumulative impacts** | **Without Mitigation** | **With Mitigation** |
| | Low - | Low - |

## 6.8 OPERATIONAL PHASE IMPACT 2. IMPACTS ON RIVERINE RABBITS DURING OPERATION

| **Issue** | **Operational Phase impact on the Riverine Rabbit** | |
|---|---|---|
| **Description of Impact** | | |
| There would potentially be impact on Riverine Rabbits at the site during operation due to operational activities (vehicles/disturbance) as well as turbine noise. | | |
| **Type of Impact** | Indirect | |
| **Nature of Impact** | Negative | |
| **Phases** | Operation | |
| **Criteria** | **Without Mitigation** | **With Mitigation** |
| **Intensity** | Medium | Medium |
| **Duration** | Long-term | Long-term |
| **Extent** | Local | Local |
| **Consequence** | Medium | Medium |
| **Probability** | Probable | Possible / frequent |
| **Significance** | Medium - | Low - |
| **Degree to which impact can be reversed** | The affected environment will be able to recover from the impact | |
| **Degree to which impact may cause irreplaceable loss of resources** | The resource is irreparably damaged and is not represented elsewhere | |
| **Degree to which impact can be mitigated** | Mitigation does not exist; or mitigation will slightly reduce the significance of impacts. | |
| **Mitigation actions** | | |
| **The following measures are recommended**: | • Adherence to a Riverine Rabbit Monitoring Plan | |
| **Monitoring** | | |
| **The following monitoring is recommended**: | • A Riverine Rabbit Monitoring Programme should be implemented in order to evaluate the post-construction impact of the development on the Riverine Rabbit as well as other key fauna at the site. As there is some potential for noise and disturbance-related impacts on Riverine Rabbits, the development presents a clear opportunity to evaluate the degree to which wind farms are compatible with the maintenance and conservation of Riverine Rabbit populations within their boundaries. The monitoring programe should be conducted with input from EWT and should include preconstruction monitoring to establish a reliable baseline of Riverine Rabbit abundance and distribution at the site. This should be followed by matched post-construction monitoring to | |

| | | |
|---|---|---|
| | evaluate the potential negative impacts on the Riverine Rabbit population. The exact duration and frequency of monitoring would need to be determined based on the number of cameras to be used and the desired precision and statistical power to be obtained.<br>• The monitoring should include a feedback mechanism to use these findings to improve future wind energy development in Riverine Rabbit areas should be developed.<br>• All incidents involving Riverine Rabbits should be documented and reported to the local EWT field office in Loxton. If Rabbits are killed, the carcases should be collected and provided to EWT for the collection of DNA and other samples.<br>• For longer term mitigation the Applicant should, develop and fund a conservation initiative for the life of the wind farm in partnership with EWT or a similar qualified NGO with experience of Riverine Rabbit Conservation in the area. This initiative should focus on enhancing management of the most suitable Riverine Rabbit Riparian habitat in the broader Karoo with the aim of halting the current trend of degradation and the associated decline in the Riverine Rabbit population. | |
| **Cumulative impacts** | | |
| **Nature of cumulative impacts** | In terms of specific cumulative impacts, impacts on the Riverine Rabbit would be a concern, but since this species was not detected in the adjacent Nuweveld WEFs, cumulative impacts on this species would be restricted to the Hoogland suite of projects. As the broader area is still largely intact with no existing renewable energy facilities present, cumulative impacts associated with the current project are considered acceptable. | |
| **Rating of cumulative impacts** | **Without Mitigation** | **With Mitigation** |
| | Low - | Low - |

## 6.9 OPERATIONAL PHASE IMPACT 3. IMPACTS ON FAUNA SCC DURING OPERATION

| | | |
|---|---|---|
| **Issue** | Operational Phase impact on fauna of SCC such as Mountain Reedbuck and Grey Rhebok | |
| **Description of Impact** | | |
| There would potentially be impact on fauna SCC at the site during operation due to operational activities as well as turbine noise. | | |
| **Type of Impact** | Direct | |
| **Nature of Impact** | Negative | |
| **Phases** | Operation | |
| **Criteria** | **Without Mitigation** | **With Mitigation** |
| **Intensity** | Medium | Low |
| **Duration** | Long-term | Long-term |
| **Extent** | Local | Local |
| **Consequence** | Medium | Medium |
| **Probability** | Possible / frequent | Conceivable |
| **Significance** | Low - | Low - |

| | | |
|---|---|---|
| **Degree to which impact can be reversed** | The affected environment will be able to recover from the impact | |
| **Degree to which impact may cause irreplaceable loss of resources** | The resource is irreparably damaged and is not represented elsewhere | |
| **Degree to which impact can be mitigated** | Mitigation does not exist; or mitigation will slightly reduce the significance of impacts | |
| **Mitigation actions** | | |
| **The following measures are recommended**: | • Ensure that maintenance and operational activities at the site result in as little faunal disturbance as possible, which would include reducing night-time activity as far as possible.<br>• The Fauna Monitoring Programme should utilise the operational period of the recommended funding to monitor the presence and activity of fauna such as Mountain Reedbuck/Grey Rhebok on the site in relation to the preconstruction baseline. | |
| **Monitoring** | | |
| **The following monitoring is recommended**: | • The presence and activity of fauna such as Mountain Reedbuck/Grey Rhebok on the site should be monitored at the site during the initial period of operation in relation to and following on from a preconstruction baseline. | |
| **Cumulative impacts** | | |
| **Nature of cumulative impacts** | The development of the wind farm would contribute to cumulative impacts on fauna SCC. | |
| **Rating of cumulative impacts** | **Without Mitigation** | **With Mitigation** |
| | Low - | Low - |

## 6.10 OPERATIONAL PHASE IMPACT 4. INCREASED SOIL EROSION RISK DURING OPERATION

| **Issue** | **Increased soil erosion during operation** | |
|---|---|---|
| **Description of Impact** | | |
| Increased soil erosion risk during operation | | |
| **Type of Impact** | Direct | |
| **Nature of Impact** | Negative | |
| **Phases** | Operation | |
| **Criteria** | **Without Mitigation** | **With Mitigation** |
| **Intensity** | Medium | Low |
| **Duration** | Long-term | Medium-term |
| **Extent** | Local | Local |
| **Consequence** | Medium | Low |
| **Probability** | Probable | Conceivable |
| **Significance** | Medium - | Very Low - |
| **Degree to which impact can be reversed** | The affected environment will be able to recover from the impact | |
| **Degree to which impact may cause irreplaceable loss of resources** | The resource is not damaged irreparably or is not scarce | |
| **Degree to which impact can be mitigated** | With mitigation, this impact can be well avoided, and erosion reduced to a low level. | |
| **Mitigation actions** | | |

| | | |
|---|---|---|
| **The following measures are recommended**: | • Annual rehabilitation activities in line with the EMPr requirements. Any erosion problems observed on-site should be rectified as soon as possible using the appropriate revegetation and erosion control works. | |
| **Monitoring** | | |
| **The following monitoring is recommended**: | • Annual monitoring and surveys for erosion. Disturbed areas near to drainage lines should receive priority in rehabilitation and operational phase monitoring. | |
| **Cumulative impacts** | | |
| **Nature of cumulative impacts** | Erosion would contribute to habitat degradation in the area and add to the existing erosion and degradation present in the area which results largely from historical land use practices. | |
| **Rating of cumulative impacts** | **Without Mitigation** | **With Mitigation** |
| | Low - | Low - |

## 6.11 DECOMMISSIONING PHASE IMPACT 1. FAUNAL IMPACTS DUE TO DECOMMISSIONING

| | | |
|---|---|---|
| **Issue** | Direct and indirect faunal impacts | |
| **Description of Impact** | | |
| Increased levels of noise, pollution, disturbance and human presence during decommissioining will be detrimental to fauna. | | |
| **Type of Impact** | Indirect | |
| **Nature of Impact** | Negative | |
| **Phases** | Decommissioning | |
| **Criteria** | **Without Mitigation** | **With Mitigation** |
| **Intensity** | High | Medium |
| **Duration** | Short-term | Short-term |
| **Extent** | Local | Local |
| **Consequence** | Medium | Medium |
| **Probability** | Probable | Possible / frequent |
| **Significance** | Medium - | Low - |
| **Degree to which impact can be reversed** | The affected environment will be able to recover from the impact. While there is some scope for avoidance of sensitive habitats, some disturbance and habitat loss for fauna is an inevitable consequence of decommissioning that cannot be entirely avoided. | |
| **Degree to which impact may cause irreplaceable loss of resources** | The resource is not damaged irreparably or is not scarce | |
| **Degree to which impact can be mitigated** | Mitigation exists and will notably reduce significance of impacts | |
| **Mitigation actions** | | |
| **The following measures are recommended**: | • All vehicles should adhere to a low speed limit on site. Heavy vehicles should be restricted to 30km/h and light vehicles to 40km/h.<br>• Any potentially dangerous fauna such as snakes or fauna threatened by the decommissioning activities should be removed | |

| | | |
|---|---|---|
| | to a safe location prior to the commencement of decommissioning activities.<br>• All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.<br>• No excavated holes or trenches should be left open for extended periods as fauna may fall in become trapped.<br>• All above-ground infrastructures should be removed from the site. Below-ground infrastructure such as cabling can be left in place if it does not pose a risk, as removal of such cables may generate additional disturbance and impact, however, this should be in accordance with the facilities' decommissioning and recycling plan. | |
| **Monitoring** | | |
| **The following monitoring is recommended**: | • Monitoring of site decommissioning by the EO to ensure that any fauna remaining within the affected area are translocated to safety where necessary.<br>• Monitoring of decommissioning activities to ensure that the infrastructure clearing and waste material removal remains within the demarcated development footprint.<br>• Holes and trenches that are open should be checked on a regular basis (preferably daily) to ensure that any fauna that have fallen in and become trapped can be rescued to safety. | |
| **Cumulative impacts** | | |
| **Nature of cumulative impacts** | Decommissioning will contribute towards cumulative impacts on fauna in the area, but this would be transient and no long-term impacts from decommissioning are likely to occur. However, as there are extensive tracts of largely undeveloped habitat present, larger fauna would be able to move away from disturbance sources during decommissioning and return thereafter. In the long-term the decommissioning would result in the development footprint being restored to a near-natural state at which time it would be become available to fauna again. | |
| **Rating of cumulative impacts** | **Without Mitigation** | **With Mitigation** |
| | Low - | Low - |

## 6.12 DECOMMISSIONING PHASE IMPACT 2. INCREASED SOIL EROSION RISK FOLLOWING DECOMMISSIONING

| | | |
|---|---|---|
| **Issue** | Increased Soil erosion | |
| **Description of Impact** | | |
| Increased soil erosion risk following decommissioning | | |
| **Type of Impact** | Direct | |
| **Nature of Impact** | Negative | |
| **Phases** | Decommissioning | |
| **Criteria** | **Without Mitigation** | **With Mitigation** |
| **Intensity** | High | Low |
| **Duration** | Long-term | Medium-term |

| | | |
|---|---|---|
| **Extent** | Local | Local |
| **Consequence** | High | Low |
| **Probability** | Probable | Conceivable |
| **Significance** | High- | Very Low - |
| **Degree to which impact can be reversed** | The affected environment will be able to recover from the impact | |
| **Degree to which impact may cause irreplaceable loss of resources** | The resource is not damaged irreparably or is not scarce | |
| **Degree to which impact can be mitigated** | With mitigation, this impact can be well avoided, and erosion reduced to a low level. | |
| **Mitigation actions** | | |
| **The following measures are recommended**: | • Decommissioning disturbance within or near the drainage lines should be kept to a minimum and any disturbance in these areas should be rehabilitated as quickly as possible.<br>• An erosion monitoring programme should be put in place for at least 3 years after decommissioning. Any problems observed should be rectified as soon as possible using the appropriate revegetation and erosion control works. | |
| **Monitoring** | | |
| **The following monitoring is recommended**: | • Annual monitoring and surveys for erosion for at least 3 years following decommissioning. Disturbed areas near to drainage lines should receive priority in rehabilitation and decommissioning phase monitoring. | |
| **Cumulative impacts** | | |
| **Nature of cumulative impacts** | Erosion would contribute to habitat degradation in the area and add to the existing erosion and degradation present in the area which results largely from historical land use practices. | |
| **Rating of cumulative impacts** | **Without Mitigation** | **With Mitigation** |
| | Medium - | Low - |

## 6.13 CUMULATIVE IMPACT 1. CUMULATIVE IMPACTS ON BROAD-SCALE ECOLOGICAL PROCESSES

| | | |
|---|---|---|
| **Issue** | Cumulative habitat loss and impact on broad-scale ecological processes | |
| **Description of Impact** | | |
| Cumulative impact on broad-scale ecological processes | | |
| **Type of Impact** | Direct | |
| **Nature of Impact** | Negative | |
| **Phases** | Operation | |
| **Criteria** | **Without Mitigation** | **With Mitigation** |
| **Intensity** | Medium | Low |
| **Duration** | Long-term | Long-term |
| **Extent** | Local | Local |
| **Consequence** | Medium | Medium |
| **Probability** | Probable | Conceivable |
| **Significance** | Medium - | Low - |
| **Degree to which impact can be reversed** | The affected environment will be able to recover from the impact | |

| | | |
|---|---|---|
| **Degree to which impact may cause irreplaceable loss of resources** | The resource is not damaged irreparably or is not scarce | |
| **Degree to which impact can be mitigated** | With avoidance and mitigation, impact on ecological processes can be reduced to low levels. | |
| **Mitigation actions** | | |
| **The following measures are recommended**: | • Adhere to the sensitivity maps and limits of acceptable change provided within this assessment when determining the final layout of the Wind Farm and associated infrastructure.<br>• Demarcate sensitive habitats as no-go areas during construction and at decommissioning. | |
| **Monitoring** | | |
| **The following monitoring is recommended**: | • Ensure that all the operational phase management plans are fully implemented and that the associated monitoring and feedback mechanisms to management are in place. | |
| **Cumulative impacts** | | |
| **Nature of cumulative impacts** | The development would contribute to habitat loss and fragmentation for some species. However, given the current low levels of transformation in the area, the contribution of the current development to cumulative impacts on broad-scale ecological processes is considered low given the porous nature of wind farm developments for most fauna as well as the widely distributed, but low overall footprint. | |
| **Rating of cumulative impacts** | **Without Mitigation** | **With Mitigation** |
| | Low - | Low - |

### *6.14* NO-GO ALTERNATIVE

Under the 'no-go' alternative, the current land use, consisting of extensive livestock grazing, would continue. When applied correctly, such livestock grazing is considered to be largely compatible with long-term biodiversity conservation, although in practice there are some negative effects associated with such land use, such as predator control and negative impacts on habitat availability for the larger ungulates that would historically have utilised the area. Under the current circumstances, the 'no-go' alternative is considered to represent a low long-term negative impact on the environment. The current development is however not an alternative land use for the site, but rather represents an additional stressor that would additively and cumulatively contribute to ecological impacts on the site.

## *7 CONCLUSION & RECOMMENDATIONS*

The Hoogland North 2 Wind Farm site is mapped as falling entirely within the Eastern Upper Karoo vegetation type. However, the current study indicates that significant areas of Upper Karoo Hardeveld are also present as well as some Southern Karoo Riviere along the major drainage lines of the site. In terms of fauna, there are several listed mammals which occur in the area and which would potentially be impacted by the development. This includes the Riverine Rabbit,

Black-footed Cat, Brown Hyena, Grey Rhebok and Mountain Reedbuck. The Riverine Rabbit is of greatest potential concern as it has the highest threat status and has also been confirmed present within the broader Hoogland North site by the current study as well as historical records.

In terms of the sensitivity and constraints mapping conducted as part of this study, there are numerous constraints operating across the site, associated largely with the drainage features of the area, Riverine Rabbit habitat and their associated applied buffers and also the steep slopes and dolerite outcrops of the site. Although these occupy a significant proportion of the site, there are also extensive open plains and low hills present across the site that are considered low to moderate sensitivity and which are suitable for wind energy development. Ultimately, it is the wind farm access roads that are the primary drivers of habitat loss within the affected area and the sensitivity mapping takes specific account of sensitive areas associated with the Karoo Padloper as well as avoiding areas of rugged terrain and steep slopes where the construction of roads would generate a lot of cut and fill or increase erosion potential or disturbance within sensitive habitats. Under the preliminary turbine layout provided, it is only Turbine 153 that lies within a turbine no-go area associated with a Riverine Rabbit buffer area. It is recommended that this turbine is either dropped from the layout or relocated to outside of the no-go area. In terms of the draft road layout, there are no roads within areas that are considered no-go areas and the road layer is considered acceptable and would generate low to moderate impacts on fauna and flora.

Although there are some CBAs within the site, there are no turbines within any of the CBAs under the indicative layout, although there an access road that traverse one of the CBAs. The larger CBAs of the site have however been entirely avoided with the result that impacts on the CBAs would be low and restricted to a small amount of habitat loss. All of the minor drainage systems and washes of the site are mapped as ESAs and it is not possible for the development to entirely avoid these features. As a result, there would be some impact on these minor features, largely through habitat loss and disturbance associated with the access roads of the development. The ESAs are however small and represent buffers along the minor drainage features of the site and as such, do not represent broad-scale corridors or ecological gradients that would potentially be disrupted by the development. The impact of the development on CBAs and ESAs is therefore considered acceptable.

In terms of potential cumulative impacts in and around the Hoogland North 2 site, these currently amount to approximately 500ha of planned wind farm projects. The Hoogland North 2 Wind Farm would contribute an additional 130ha of long-term habitat loss to this total. Although cumulative impacts on the Riverine Rabbit are a significant potential concern, this species was not detected on the adjacent Nuweveld Wind Farms with the result that cumulative impacts on this species would be restricted to the Hoogland suite of projects. As the broader area is still largely intact with no existing renewable energy facilities present, cumulative impacts associated with the current project are considered acceptable.

The Riverine Rabbit was detected at four localities within the adjacent Hoogland North 1 site during the current study and appears to have a high fidelity for specific riparian communities associated with the larger drainage systems of the site. The areas of potentially suitable habitat have been buffered from turbines by up to 500m depending on the landscape context and the potential for impact due to turbine noise and flicker. These buffers project into the Hoogland North 2 site and there is also an area of potential habitat in the west of the Hoogland North 2 site where Rabbits have not been detected as yet. The buffers and corridor linkages between the identified major habitat patches have been integrated into the turbine no-go layer and this explicitly informs the location of turbines at the site. Based on the turbine layout provided for the current assessment, there is a single turbine (WTG153) that falls within a Riverine Rabbit habitat buffer and which should be dropped from the layout or relocated. With this mitigation in place, impacts on Riverine Rabbits are expected to be relatively low.

It is recommended that a Riverine Rabbit Monitoring Programme should be implemented at the site to evaluate the post-construction impact of the development on the Riverine Rabbit as well as other key fauna at the site. As there is some potential for noise and disturbance-related impacts on Riverine Rabbits, the development presents a clear opportunity to evaluate the degree to which wind farms are compatible with the maintenance and conservation of Riverine Rabbit populations within their boundaries. The details of the monitoring programme should be developed in collaboration with the EWT Dryland Programme and should at minimum include the following components and outcomes:

- Preconstruction monitoring to establish a reliable baseline of Riverine Rabbit abundance and distribution at the site.
- Matched post-construction monitoring to evaluate the potential negative impacts on the Riverine Rabbit population.
- It is estimated that each phase of the above monitoring would need to last approximately 1 year (although the actual monitoring may be implemented seasonally). The monitoring must be conducted in a manner which allows for reliable effect sizes and statistically-backed inferences to be made.
- Funding to conduct the above monitoring and a feedback mechanism to improve future wind energy development in areas with Riverine Rabbits (ie input on guidelines for wind energy development in Riverine Rabbit areas).

Based on the results of the current study, the impacts associated with the Hoogland North 2 Wind Farm are likely to be medium to low after mitigation. Although the potential presence of the Riverine Rabbit on the site is a concern, the distribution of this species in the area shows a high fidelity for a specific associated habitat and as such, can be reliably mapped and hence avoided. Impacts on the Riverine Rabbit can therefore likely be reduced an acceptable level. In terms of other fauna of concern, while some fauna SCC may be present it is highly unlikely that the development would compromise the local populations of these species. In addition, impacts on CBAs, ESAs and cumulative impacts associated with the development are considered

acceptable. As a result, and with the application of the recommended mitigation and avoidance measures, the impact of the Hoogland North 2 Wind Farm is considered acceptable and hence, from an ecological perspective, the development should be allowed to proceed to the EIA phase. A plan of study for the EIA phase to address outstanding areas of uncertainty is detailed below.

## 7.1 PLAN OF STUDY FOR THE EIA PHASE

Although a significant amount of field work has been conducted to date on the Hoogland Northern Wind Farm site, there are still a few areas of uncertainty that would be addressed to inform the EIA phase of the development. The following activities and outcomes are anticipated:

- Additional camera trapping on the site to characterise the faunal communities present to a greater degree and in particular greater clarity on the distribution of the Riverine Rabbit on the site as well as the presence of other fauna SCC such as Mountain Reedbuck and Grey Rhebok.
- The conditions on the site to date have been dry with the result that vegetation surveys conducted to date are not likely to have captured the full suite of species present. The wet season is anticipated during the summer and once the vegetation is in a better condition, detailed vegetation surveys across the site will be conducted. Particular attention will also be paid to the presence of rare or specialised habitats on the site. To date, no species of high conservation concern have been observed and should the situation remain the same, the site sensitivity in terms of flora would be low and a compliance statement would be the appropriate level of study for vegetation in the EIA phase.
- Engage with EWT Dryland Programme around the Riverine Rabbit and the details of the proposed Riverine Rabbit and broader fauna monitoring programme. Establish applicable mitigation measures that could be applied to further reduce the impact of the development on Riverine Rabbit.
- Verify the final footprint of the development in the field to ensure that it avoids the sensitive features of the site and to confirm site sensitivity from a terrestrial biodiversity perspective.
- Identify in the field and based on the Wind Farm layout any additional impacts that may occur as a result of the development that have not been identified thus far.
- Identify any additional mitigation and avoidance measures for inclusion in the EMPr that should be implemented to further reduce the impacts of the development on terrestrial biodiversity.

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## 9 ANNEX 1. LIST OF PLANT SPECIES

List of plant species recorded from the broad vicinity of the Hoogland North Wind Farm site, based on the SANBI Plants of southern Africa (POSA) database.

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Acanthaceae | *Acanthopsis* | *hoffmannseggiana* | | | DD |
| Acanthaceae | *Barleria* | *stimulans* | | | LC |
| Acanthaceae | *Blepharis* | *mitrata* | | | LC |
| Acanthaceae | *Blepharis* | *capensis* | | | LC |
| Acanthaceae | *Justicia* | *incana* | | | |
| Acanthaceae | *Justicia* | *orchioides* | subsp. | *glabrata* | LC |
| Acanthaceae | *Justicia* | *spartioides* | | | |
| Achariaceae | *Guthriea* | *capensis* | | | LC |
| Achariaceae | *Kiggelaria* | *africana* | | | LC |
| Aizoaceae | *Aizoon* | *glinoides* | | | LC |
| Aizoaceae | *Chasmatophyllum* | *stanleyi* | | | LC |
| Aizoaceae | *Chasmatophyllum* | *maninum* | | | DD |
| Aizoaceae | *Delosperma* | sp. | | | |
| Aizoaceae | *Drosanthemum* | *parvifolium* | | | LC |
| Aizoaceae | *Drosanthemum* | *floribundum* | | | LC |
| Aizoaceae | *Drosanthemum* | *lique* | | | LC |
| Aizoaceae | *Drosanthemum* | *subcompressum* | | | LC |
| Aizoaceae | *Drosanthemum* | *hispidum* | | | LC |
| Aizoaceae | *Drosanthemum* | *archeri* | | | LC |
| Aizoaceae | *Drosanthemum* | sp. | | | |
| Aizoaceae | *Galenia* | *pubescens* | | | LC |
| Aizoaceae | *Galenia* | *africana* | | | LC |
| Aizoaceae | *Galenia* | *fruticosa* | | | LC |
| Aizoaceae | *Galenia* | *secunda* | | | LC |
| Aizoaceae | *Galenia* | *glandulifera* | | | LC |
| Aizoaceae | *Galenia* | *pallens* | | | DD |
| Aizoaceae | *Galenia* | *sarcophylla* | | | LC |
| Aizoaceae | *Galenia* | *squamulosa* | | | LC |
| Aizoaceae | *Hereroa* | *concava* | | | DD |
| Aizoaceae | *Malephora* | *thunbergii* | | | LC |
| Aizoaceae | *Malephora* | *purpureo-crocea* | | | LC |
| Aizoaceae | *Mesembryanthemum* | *splendens* | subsp. | *pentagonum* | |
| Aizoaceae | *Mesembryanthemum* | *junceum* | | | |
| Aizoaceae | *Mesembryanthemum* | *noctiflorum* | subsp. | *stramineum* | |

[5] IUCN Threat Status

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | DD | Data Deficient | **3** | NT | Near Threatened | **5** | EN | Endangered | **7** | EW | Extinct In The Wild |
| **2** | LC | Least Concern | **4** | VU | Vulnerable | **6** | CR | Critically Endangered | **8** | EX | Extinct |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Aizoaceae | *Mesembryanthemum* | *geniculiflorum* | | | |
| Aizoaceae | *Mesembryanthemum* | *stenandrum* | | | LC |
| Aizoaceae | *Mesembryanthemum* | *oubergense* | | | LC |
| Aizoaceae | *Mesembryanthemum* | *tetragonum* | | | |
| Aizoaceae | *Mesembryanthemum* | sp. | | | |
| Aizoaceae | *Mesembryanthemum* | *coriarium* | | | |
| Aizoaceae | *Mesembryanthemum* | *nodiflorum* | | | LC |
| Aizoaceae | *Mesembryanthemum* | *emarcidum* | | | |
| Aizoaceae | *Mesembryanthemum* | *crystallinum* | | | LC |
| Aizoaceae | *Mestoklema* | *tuberosum* | | | LC |
| Aizoaceae | *Mestoklema* | *arboriforme* | | | LC |
| Aizoaceae | *Pleiospilos* | *compactus* | subsp. | *canus* | LC |
| Aizoaceae | *Pleiospilos* | *compactus* | subsp. | *compactus* | LC |
| Aizoaceae | *Plinthus* | *cryptocarpus* | | | LC |
| Aizoaceae | *Plinthus* | *karooicus* | | | LC |
| Aizoaceae | *Ruschia* | *intricata* | | | LC |
| Aizoaceae | *Ruschia* | *sp.* | | | |
| Aizoaceae | *Ruschia* | *spinosa* | | | LC |
| Aizoaceae | *Ruschia* | *pauciflora* | | | DD |
| Aizoaceae | *Stomatium* | sp. | | | |
| Aizoaceae | *Stomatium* | *suaveolens* | | | LC |
| Aizoaceae | *Stomatium* | *villetii* | | | LC |
| Aizoaceae | *Tetragonia* | *arbuscula* | | | LC |
| Aizoaceae | *Tetragonia* | *spicata* | | | LC |
| Aizoaceae | *Tetragonia* | *glauca* | | | LC |
| Aizoaceae | *Tetragonia* | *fruticosa* | | | LC |
| Aizoaceae | *Tetragonia* | *sarcophylla* | | | LC |
| Aizoaceae | *Trianthema* | *parvifolia* | var. | *parvifolia* | LC |
| Aizoaceae | *Trichodiadema* | sp. | | | |
| Aizoaceae | *Trichodiadema* | *obliquum* | | | DD |
| Aizoaceae | *Trichodiadema* | *intonsum* | | | LC |
| Aizoaceae | *Trichodiadema* | *barbatum* | | | LC |
| Aizoaceae | *Trichodiadema* | *densum* | | | LC |
| Aizoaceae | *Trichodiadema* | *setuliferum* | | | LC |
| Alliaceae | *Tulbaghia* | *nutans* | | | LC |
| Alliaceae | *Tulbaghia* | *leucantha* | | | LC |
| Amaranthaceae | *Amaranthus* | *schinzianus* | | | LC |
| Amaranthaceae | *Amaranthus* | *deflexus* | | | |
| Amaranthaceae | *Atriplex* | *semibaccata* | | | |
| Amaranthaceae | *Atriplex* | *lindleyi* | subsp. | *inflata* | |
| Amaranthaceae | *Atriplex* | *nummularia* | subsp. | *nummularia* | |
| Amaranthaceae | *Atriplex* | *vestita* | var. | *appendiculata* | LC |
| Amaranthaceae | *Bassia* | *salsoloides* | | | LC |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Amaranthaceae | *Chenopodium* | *album* | | | |
| Amaranthaceae | *Chenopodium* | *schraderianum* | | | |
| Amaranthaceae | *Dysphania* | *carinata* | | | |
| Amaranthaceae | *Kyphocarpa* | *angustifolia* | | | LC |
| Amaranthaceae | *Salsola* | *kali* | | | |
| Amaranthaceae | *Salsola* | *calluna* | | | LC |
| Amaranthaceae | *Salsola* | *aphylla* | | | LC |
| Amaranthaceae | *Sericocoma* | *avolans* | | | LC |
| Amaranthaceae | *Suaeda* | *inflata* | | | LC |
| Amaranthaceae | *Suaeda* | *fruticosa* | | | LC |
| Amaryllidaceae | *Gethyllis* | *villosa* | | | LC |
| Amaryllidaceae | *Gethyllis* | *longistyla* | | | LC |
| Anacampserotaceae | *Anacampseros* | *ustulata* | | | LC |
| Anacampserotaceae | *Anacampseros* | *albidiflora* | | | LC |
| Anacardiaceae | *Searsia* | *pyroides* | | | |
| Anacardiaceae | *Searsia* | *pyroides* | var. | *pyroides* | LC |
| Anacardiaceae | *Searsia* | *longispina* | | | LC |
| Anacardiaceae | *Searsia* | *undulata* | | | LC |
| Anacardiaceae | *Searsia* | *lancea* | | | LC |
| Anacardiaceae | *Searsia* | *burchellii* | | | LC |
| Apiaceae | *Annesorhiza* | *filicaulis* | | | EN |
| Apiaceae | *Apium* | *graveolens* | | | |
| Apiaceae | *Berula* | *thunbergii* | | | LC |
| Apiaceae | *Chamarea* | *longipedicellata* | | | LC |
| Apiaceae | *Conium* | *chaerophylloides* | | | LC |
| Apiaceae | *Deverra* | *denudata* | subsp. | *aphylla* | LC |
| Apiaceae | *Heteromorpha* | *arborescens* | var. | *arborescens* | LC |
| Apiaceae | *Notobubon* | *ferulaceum* | | | LC |
| Apiaceae | *Notobubon* | *laevigatum* | | | LC |
| Apocynaceae | *Asclepias* | sp. | | | |
| Apocynaceae | *Carissa* | *bispinosa* | | | LC |
| Apocynaceae | *Duvalia* | *maculata* | | | LC |
| Apocynaceae | *Duvalia* | *angustiloba* | | | LC |
| Apocynaceae | *Gomphocarpus* | *filiformis* | | | LC |
| Apocynaceae | *Gomphocarpus* | *fruticosus* | subsp. | *fruticosus* | LC |
| Apocynaceae | *Huernia* | *thuretii* | | | LC |
| Apocynaceae | *Huernia* | *humilis* | | | LC |
| Apocynaceae | *Huernia* | *barbata* | subsp. | *barbata* | LC |
| Apocynaceae | *Microloma* | *armatum* | var. | *armatum* | LC |
| Apocynaceae | *Schizoglossum* | *bidens* | subsp. | *atrorubens* | LC |
| Apocynaceae | *Stapelia* | *grandiflora* | var. | *grandiflora* | LC |
| Apocynaceae | *Xysmalobium* | *gomphocarpoides* | var. | *gomphocarpoides* | LC |
| Araliaceae | *Cussonia* | *paniculata* | subsp. | *paniculata* | LC |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Asparagaceae | *Asparagus* | *mucronatus* | | | LC |
| Asparagaceae | *Asparagus* | *laricinus* | | | LC |
| Asparagaceae | *Asparagus* | *exuvialis* | forma | *exuvialis* | NE |
| Asparagaceae | *Asparagus* | *racemosus* | | | LC |
| Asparagaceae | *Asparagus* | *capensis* | var. | *capensis* | LC |
| Asparagaceae | *Asparagus* | *striatus* | | | LC |
| Asparagaceae | *Asparagus* | *burchellii* | | | LC |
| Asparagaceae | *Asparagus* | *retrofractus* | | | LC |
| Asparagaceae | *Asparagus* | *aethiopicus* | | | LC |
| Asparagaceae | *Asparagus* | *suaveolens* | | | LC |
| Asphodelaceae | *Aloe* | *grandidentata* | | | LC |
| Asphodelaceae | *Aloe* | *claviflora* | | | LC |
| Asphodelaceae | *Astroloba* | sp. | | | |
| Asphodelaceae | *Astroloba* | *congesta* | | | LC |
| Asphodelaceae | *Bulbine* | *lagopus* | | | LC |
| Asphodelaceae | *Bulbine* | sp. | | | |
| Asphodelaceae | *Bulbine* | *frutescens* | | | LC |
| Asphodelaceae | *Gonialoe* | *variegata* | | | LC |
| Asphodelaceae | *Haworthia* | *semiviva* | | | LC |
| Asphodelaceae | *Haworthia* | *marumiana* | var. | *marumiana* | NE |
| Asphodelaceae | *Haworthiopsis* | *fasciata* | | | |
| Asphodelaceae | *Kniphofia* | *uvaria* | | | LC |
| Asphodelaceae | *Trachyandra* | *karrooica* | | | LC |
| Asphodelaceae | *Trachyandra* | *acocksii* | | | LC |
| Aspleniaceae | *Asplenium* | *cordatum* | | | LC |
| Asteraceae | *Amellus* | *tridactylus* | subsp. | *olivaceus* | LC |
| Asteraceae | *Arctotis* | *dimorphocarpa* | | | LC |
| Asteraceae | *Arctotis* | *microcephala* | | | LC |
| Asteraceae | *Arctotis* | *perfoliata* | | | LC |
| Asteraceae | *Arctotis* | *leiocarpa* | | | LC |
| Asteraceae | *Athanasia* | *microcephala* | | | LC |
| Asteraceae | *Athanasia* | *linifolia* | | | LC |
| Asteraceae | *Berkheya* | *spinosa* | | | LC |
| Asteraceae | *Berkheya* | *glabrata* | | | LC |
| Asteraceae | *Berkheya* | *pinnatifida* | subsp. | *pinnatifida* | LC |
| Asteraceae | *Berkheya* | *carlinifolia* | | | |
| Asteraceae | *Berkheya* | sp. | | | |
| Asteraceae | *Berkheya* | *spinosissima* | subsp. | *spinosissima* | LC |
| Asteraceae | *Caputia* | *tomentosa* | | | LC |
| Asteraceae | *Centaurea* | *melitensis* | | | |
| Asteraceae | *Chrysocoma* | *obtusata* | | | LC |
| Asteraceae | *Chrysocoma* | *ciliata* | | | LC |
| Asteraceae | *Chrysocoma* | sp. | | | |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Asteraceae | *Cichorium* | *intybus* | subsp. | *intybus* | |
| Asteraceae | *Cineraria* | *vagans* | | | EN |
| Asteraceae | *Cineraria* | *lobata* | subsp. | *lobata* | LC |
| Asteraceae | *Cineraria* | *mollis* | | | LC |
| Asteraceae | *Cineraria* | *aspera* | | | LC |
| Asteraceae | *Cineraria* | *lobata* | subsp. | *lasiocaulis* | LC |
| Asteraceae | *Cirsium* | *vulgare* | | | |
| Asteraceae | *Conyza* | *scabrida* | | | |
| Asteraceae | *Cotula* | *microglossa* | | | LC |
| Asteraceae | *Cotula* | *coronopifolia* | | | LC |
| Asteraceae | *Crassothonna* | *capensis* | | | LC |
| Asteraceae | *Crassothonna* | *protecta* | | | LC |
| Asteraceae | *Curio* | *hallianus* | | | LC |
| Asteraceae | *Cuspidia* | *cernua* | subsp. | *annua* | LC |
| Asteraceae | *Dicerothamnus* | *rhinocerotis* | | | |
| Asteraceae | *Dicoma* | *capensis* | | | LC |
| Asteraceae | *Dimorphotheca* | *cuneata* | | | LC |
| Asteraceae | *Eriocephalus* | *microphyllus* | var. | *microphyllus* | LC |
| Asteraceae | *Eriocephalus* | *eximius* | | | LC |
| Asteraceae | *Eriocephalus* | *microcephalus* | | | LC |
| Asteraceae | *Eriocephalus* | *brevifolius* | | | LC |
| Asteraceae | *Eriocephalus* | *tenuifolius* | | | LC |
| Asteraceae | *Eriocephalus* | *ericoides* | subsp. | *ericoides* | LC |
| Asteraceae | *Eriocephalus* | *decussatus* | | | LC |
| Asteraceae | *Eriocephalus* | *spinescens* | | | LC |
| Asteraceae | *Eriocephalus* | sp. | | | |
| Asteraceae | *Eumorphia* | *corymbosa* | | | LC |
| Asteraceae | *Euryops* | *nodosus* | | | LC |
| Asteraceae | *Euryops* | *lateriflorus* | | | LC |
| Asteraceae | *Euryops* | *anthemoides* | subsp. | *anthemoides* | LC |
| Asteraceae | *Euryops* | *imbricatus* | | | LC |
| Asteraceae | *Euryops* | *empetrifolius* | | | LC |
| Asteraceae | *Euryops* | *oligoglossus* | subsp. | *oligoglossus* | LC |
| Asteraceae | *Euryops* | *oligoglossus* | subsp. | *racemosus* | LC |
| Asteraceae | *Euryops* | *subcarnosus* | subsp. | *vulgaris* | LC |
| Asteraceae | *Euryops* | *abrotanifolius* | | | LC |
| Asteraceae | *Felicia* | *namaquana* | | | LC |
| Asteraceae | *Felicia* | *lasiocarpa* | | | LC |
| Asteraceae | *Felicia* | *muricata* | subsp. | *muricata* | LC |
| Asteraceae | *Felicia* | *ovata* | | | LC |
| Asteraceae | *Felicia* | *filifolia* | subsp. | *schaeferi* | LC |
| Asteraceae | *Felicia* | *filifolia* | subsp. | *filifolia* | LC |
| Asteraceae | *Felicia* | *hirsuta* | | | LC |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Asteraceae | *Felicia* | *rogersii* | | | LC |
| Asteraceae | *Garuleum* | *bipinnatum* | | | LC |
| Asteraceae | *Gazania* | *lichtensteinii* | | | LC |
| Asteraceae | *Gazania* | *krebsiana* | | | |
| Asteraceae | *Gazania* | *krebsiana* | subsp. | *serrulata* | LC |
| Asteraceae | *Gazania* | *serrata* | | | LC |
| Asteraceae | *Gazania* | *krebsiana* | subsp. | *arctotoides* | LC |
| Asteraceae | *Geigeria* | *obtusifolia* | | | LC |
| Asteraceae | *Geigeria* | *filifolia* | | | LC |
| Asteraceae | *Geigeria* | *ornativa* | subsp. | *ornativa* | LC |
| Asteraceae | *Gnaphalium* | *confine* | | | LC |
| Asteraceae | *Gorteria* | *alienata* | | | |
| Asteraceae | *Helichrysum* | *albertense* | | | DD |
| Asteraceae | *Helichrysum* | *cerastioides* | var. | *cerastioides* | LC |
| Asteraceae | *Helichrysum* | *rugulosum* | | | LC |
| Asteraceae | *Helichrysum* | *pumilio* | subsp. | *pumilio* | LC |
| Asteraceae | *Helichrysum* | *dregeanum* | | | LC |
| Asteraceae | *Helichrysum* | *lineare* | | | LC |
| Asteraceae | *Helichrysum* | *zeyheri* | | | LC |
| Asteraceae | *Helichrysum* | *pentzioides* | | | LC |
| Asteraceae | *Helichrysum* | *lucilioides* | | | LC |
| Asteraceae | *Helichrysum* | *trilineatum* | | | LC |
| Asteraceae | *Helichrysum* | *rosum* | var. | *arcuatum* | LC |
| Asteraceae | *Hertia* | *cluytiifolia* | | | LC |
| Asteraceae | *Ifloga* | *glomerata* | | | LC |
| Asteraceae | *Kleinia* | *longiflora* | | | LC |
| Asteraceae | *Lactuca* | *inermis* | | | LC |
| Asteraceae | *Lasiopogon* | *glomerulatus* | | | LC |
| Asteraceae | *Lasiopogon* | *muscoides* | | | LC |
| Asteraceae | *Leysera* | *tenella* | | | LC |
| Asteraceae | *Leysera* | *gnaphalodes* | | | LC |
| Asteraceae | *Macledium* | *spinosum* | | | LC |
| Asteraceae | *Mantisalca* | *salmantica* | | | |
| Asteraceae | *Oedera* | *spinescens* | | | |
| Asteraceae | *Oedera* | *oppositifolia* | | | |
| Asteraceae | *Oedera* | *humilis* | | | |
| Asteraceae | *Oedera* | *glandulosa* | | | |
| Asteraceae | *Oncosiphon* | *grandiflorus* | | | LC |
| Asteraceae | *Oncosiphon* | *piluliferus* | | | LC |
| Asteraceae | *Osteospermum* | *scariosum* | var. | *scariosum* | NE |
| Asteraceae | *Osteospermum* | *calendulaceum* | | | LC |
| Asteraceae | *Osteospermum* | *scariosum* | var. | *integrifolium* | NE |
| Asteraceae | *Osteospermum* | *spinescens* | | | LC |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Asteraceae | *Osteospermum* | *sinuatum* | | | |
| Asteraceae | *Osteospermum* | *leptolobum* | | | LC |
| Asteraceae | *Osteospermum* | *microphyllum* | | | LC |
| Asteraceae | *Othonna* | *eriocarpa* | | | LC |
| Asteraceae | *Othonna* | *furcata* | | | LC |
| Asteraceae | *Othonna* | *pavonia* | | | LC |
| Asteraceae | *Pegolettia* | *retrofracta* | | | LC |
| Asteraceae | *Pentzia* | *tortuosa* | | | LC |
| Asteraceae | *Pentzia* | *globosa* | | | LC |
| Asteraceae | *Pentzia* | *quinquefida* | | | LC |
| Asteraceae | *Pentzia* | *lanata* | | | LC |
| Asteraceae | *Pentzia* | *punctata* | | | LC |
| Asteraceae | *Pentzia* | *incana* | | | LC |
| Asteraceae | *Pentzia* | sp. | | | |
| Asteraceae | *Phymaspermum* | *aciculare* | | | LC |
| Asteraceae | *Phymaspermum* | *thymelaeoides* | | | |
| Asteraceae | *Phymaspermum* | *parvifolium* | | | LC |
| Asteraceae | *Pseudognaphalium* | *undulatum* | | | LC |
| Asteraceae | *Pseudognaphalium* | *luteoalbum* | | | LC |
| Asteraceae | *Pteronia* | *adenocarpa* | | | LC |
| Asteraceae | *Pteronia* | *staehelinoides* | | | LC |
| Asteraceae | *Pteronia* | *membranacea* | | | LC |
| Asteraceae | *Pteronia* | *glaucescens* | | | LC |
| Asteraceae | *Pteronia* | *glauca* | | | LC |
| Asteraceae | *Pteronia* | *paniculata* | | | LC |
| Asteraceae | *Pteronia* | *viscosa* | | | LC |
| Asteraceae | *Pteronia* | *glomerata* | | | LC |
| Asteraceae | *Rhynchopsidium* | *sessiliflorum* | | | LC |
| Asteraceae | *Senecio* | *hastatus* | | | LC |
| Asteraceae | *Senecio* | *angustifolius* | | | LC |
| Asteraceae | *Senecio* | *reptans* | | | LC |
| Asteraceae | *Senecio* | *striatifolius* | | | LC |
| Asteraceae | *Senecio* | *articulatus* | | | |
| Asteraceae | *Senecio* | *asperulus* | | | LC |
| Asteraceae | *Senecio* | sp. | | | |
| Asteraceae | *Senecio* | *burchellii* | | | LC |
| Asteraceae | *Senecio* | *cordifolius* | | | LC |
| Asteraceae | *Senecio* | *cotyledonis* | | | LC |
| Asteraceae | *Senecio* | *achilleifolius* | | | LC |
| Asteraceae | *Senecio* | *incomptus* | | | LC |
| Asteraceae | *Senecio* | *madagascariensis* | | | LC |
| Asteraceae | *Senecio* | *pinnulatus* | | | LC |
| Asteraceae | *Senecio* | *niveus* | | | LC |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Asteraceae | *Sonchus* | *asper* | subsp. | *asper* | |
| Asteraceae | *Sonchus* | *tenerrimus* | | | LC |
| Asteraceae | *Symphyotrichum* | *squamatum* | | | |
| Asteraceae | *Tarchonanthus* | *minor* | | | LC |
| Asteraceae | *Tragopogon* | *dubius* | | | |
| Asteraceae | *Troglophyton* | *capillaceum* | subsp. | *capillaceum* | LC |
| Asteraceae | *Ursinia* | *nana* | subsp. | *nana* | LC |
| Asteraceae | *Vellereophyton* | *niveum* | | | LC |
| Asteraceae | *Vellereophyton* | *dealbatum* | | | LC |
| Bignoniaceae | *Rhigozum* | *obovatum* | | | LC |
| Bignoniaceae | *Rhigozum* | *trichotomum* | | | LC |
| Boraginaceae | *Amsinckia* | *menziesii* | | | |
| Boraginaceae | *Anchusa* | sp. | | | |
| Boraginaceae | *Anchusa* | *riparia* | | | LC |
| Boraginaceae | *Heliotropium* | *supinum* | | | |
| Boraginaceae | *Lappula* | *heteracantha* | | | |
| Boraginaceae | *Lobostemon* | *stachydeus* | | | LC |
| Boraginaceae | *Trichodesma* | *africanum* | | | LC |
| Brassicaceae | *Erucastrum* | *strigosum* | | | LC |
| Brassicaceae | *Heliophila* | sp. | | | |
| Brassicaceae | *Heliophila* | *suavissima* | | | LC |
| Brassicaceae | *Heliophila* | *minima* | | | LC |
| Brassicaceae | *Heliophila* | *trifurca* | | | LC |
| Brassicaceae | *Heliophila* | *crithmifolia* | | | LC |
| Brassicaceae | *Lepidium* | *africanum* | subsp. | *africanum* | LC |
| Brassicaceae | *Lepidium* | *englerianum* | | | |
| Brassicaceae | *Lepidium* | *desertorum* | | | LC |
| Brassicaceae | *Sisymbrium* | *burchellii* | var. | *burchellii* | LC |
| Brassicaceae | *Sisymbrium* | *capense* | | | LC |
| Bryaceae | *Bryum* | *alpinum* | | | |
| Campanulaceae | *Wahlenbergia* | *cernua* | | | LC |
| Campanulaceae | *Wahlenbergia* | *capillacea* | subsp. | *capillacea* | LC |
| Campanulaceae | *Wahlenbergia* | *nodosa* | | | LC |
| Capparaceae | *Cadaba* | *aphylla* | | | LC |
| Caryophyllaceae | *Cerastium* | *capense* | | | LC |
| Caryophyllaceae | *Dianthus* | *namaensis* | var. | *dinteri* | LC |
| Caryophyllaceae | *Dianthus* | *micropetalus* | | | LC |
| Caryophyllaceae | *Pollichia* | *campestris* | | | LC |
| Caryophyllaceae | *Polycarpon* | *tetraphyllum* | | | |
| Caryophyllaceae | *Silene* | *burchellii* | subsp. | *modesta* | LC |
| Caryophyllaceae | *Silene* | *undulata* | subsp. | *undulata* | LC |
| Caryophyllaceae | *Silene* | *burchellii* | subsp. | *pilosellifolia* | |
| Caryophyllaceae | *Silene* | *undulata* | | | |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Caryophyllaceae | *Spergularia* | sp. | | | |
| Caryophyllaceae | *Spergularia* | *media* | | | |
| Celastraceae | *Gymnosporia* | *buxifolia* | | | LC |
| Colchicaceae | *Colchicum* | *melanthoides* | | | |
| Colchicaceae | *Colchicum* | *burkei* | | | LC |
| Colchicaceae | *Colchicum* | *asteroides* | | | LC |
| Colchicaceae | *Colchicum* | *albomarginatum* | | | LC |
| Colchicaceae | *Colchicum* | *striatum* | | | LC |
| Colchicaceae | *Ornithoglossum* | *dinteri* | | | LC |
| Colchicaceae | *Ornithoglossum* | *undulatum* | | | LC |
| Convolvulaceae | *Convolvulus* | *dregeanus* | | | LC |
| Convolvulaceae | *Convolvulus* | *sagittatus* | | | LC |
| Crassulaceae | *Adromischus* | *maculatus* | | | LC |
| Crassulaceae | *Adromischus* | *humilis* | | | LC |
| Crassulaceae | *Adromischus* | *hemisphaericus* | | | LC |
| Crassulaceae | *Cotyledon* | *cuneata* | | | LC |
| Crassulaceae | *Cotyledon* | *papillaris* | | | LC |
| Crassulaceae | *Cotyledon* | *orbiculata* | var. | *oblonga* | LC |
| Crassulaceae | *Crassula* | *corallina* | subsp. | *corallina* | LC |
| Crassulaceae | *Crassula* | *capitella* | subsp. | *thyrsiflora* | LC |
| Crassulaceae | *Crassula* | *pubescens* | subsp. | *pubescens* | LC |
| Crassulaceae | *Crassula* | *subaphylla* | var. | *subaphylla* | LC |
| Crassulaceae | *Crassula* | *rupestris* | subsp. | *rupestris* | LC |
| Crassulaceae | *Crassula* | *natans* | var. | *minus* | LC |
| Crassulaceae | *Crassula* | *montana* | subsp. | *quadrangularis* | LC |
| Crassulaceae | *Crassula* | *tetragona* | subsp. | *tetragona* | LC |
| Crassulaceae | *Crassula* | *natans* | | | |
| Crassulaceae | *Crassula* | *garibina* | subsp. | *glabra* | LC |
| Crassulaceae | *Crassula* | *corallina* | subsp. | *macrorrhiza* | LC |
| Crassulaceae | *Crassula* | *muscosa* | var. | *muscosa* | NE |
| Crassulaceae | *Crassula* | *deltoidea* | | | LC |
| Cucurbitaceae | *Citrullus* | *lanatus* | | | LC |
| Cucurbitaceae | *Cucumis* | *africanus* | | | LC |
| Cucurbitaceae | *Cucumis* | *zeyheri* | | | LC |
| Cucurbitaceae | *Cucumis* | *myriocarpus* | subsp. | *leptodermis* | LC |
| Cyperaceae | *Afroscirpoides* | *dioeca* | | | |
| Cyperaceae | *Bulbostylis* | *humilis* | | | LC |
| Cyperaceae | *Cyperus* | *longus* | var. | *tenuiflorus* | NE |
| Cyperaceae | *Cyperus* | *bellus* | | | LC |
| Cyperaceae | *Cyperus* | *capensis* | | | LC |
| Cyperaceae | *Cyperus* | *marginatus* | | | LC |
| Cyperaceae | *Cyperus* | *laevigatus* | | | LC |
| Cyperaceae | *Cyperus* | *usitatus* | | | LC |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Cyperaceae | *Ficinia* | *ramosissima* | | | LC |
| Cyperaceae | *Fuirena* | *coerulescens* | | | LC |
| Cyperaceae | *Isolepis* | *setacea* | | | LC |
| Cyperaceae | *Isolepis* | *expallescens* | | | VU |
| Cyperaceae | *Isolepis* | *karroica* | | | LC |
| Cyperaceae | *Pseudoschoenus* | *inanis* | | | LC |
| Cyperaceae | *Schoenoxiphium* | sp. | | | |
| Dipsacaceae | *Scabiosa* | *columbaria* | | | LC |
| Ditrichaceae | *Ceratodon* | *purpureus* | subsp. | *stenocarpus* | |
| Ebenaceae | *Diospyros* | *lycioides* | subsp. | *lycioides* | LC |
| Ebenaceae | *Diospyros* | *austro-africana* | var. | *austro-africana* | LC |
| Ebenaceae | *Diospyros* | *austro-africana* | var. | *microphylla* | LC |
| Ebenaceae | *Euclea* | *crispa* | subsp. | *ovata* | LC |
| Euphorbiaceae | *Euphorbia* | *peplus* | | | NE |
| Euphorbiaceae | *Euphorbia* | *serpens* | | | NE |
| Euphorbiaceae | *Euphorbia* | *stellispina* | | | LC |
| Euphorbiaceae | *Euphorbia* | *rhombifolia* | | | LC |
| Euphorbiaceae | *Euphorbia* | *hypogaea* | | | LC |
| Euphorbiaceae | *Euphorbia* | *inaequilatera* | | | LC |
| Euphorbiaceae | *Euphorbia* | *spartaria* | | | LC |
| Euphorbiaceae | *Euphorbia* | sp. | | | |
| Euphorbiaceae | *Euphorbia* | *clavarioides* | | | LC |
| Euphorbiaceae | *Euphorbia* | *mauritanica* | | | LC |
| Euphorbiaceae | *Euphorbia* | *cylindrica* | | | LC |
| Euphorbiaceae | *Ricinus* | *communis* | var. | *communis* | NE |
| Fabaceae | *Argyrolobium* | *argenteum* | | | LC |
| Fabaceae | *Argyrolobium* | sp. | | | |
| Fabaceae | *Aspalathus* | *acicularis* | subsp. | *acicularis* | LC |
| Fabaceae | *Aspalathus* | *aciphylla* | | | LC |
| Fabaceae | *Dichilus* | *gracilis* | | | LC |
| Fabaceae | *Indigastrum* | *niveum* | | | |
| Fabaceae | *Indigofera* | *meyeriana* | | | LC |
| Fabaceae | *Indigofera* | *alternans* | var. | *alternans* | LC |
| Fabaceae | *Indigofera* | *alternans* | | | |
| Fabaceae | *Indigofera* | *exigua* | | | LC |
| Fabaceae | *Indigofera* | *sessilifolia* | | | LC |
| Fabaceae | *Indigofera* | sp. | | | |
| Fabaceae | *Indigofera* | *heterophylla* | | | LC |
| Fabaceae | *Lessertia* | *inflata* | | | LC |
| Fabaceae | *Lessertia* | *pauciflora* | | | |
| Fabaceae | *Lessertia* | *frutescens* | subsp. | *microphylla* | LC |
| Fabaceae | *Lessertia* | *frutescens* | subsp. | *frutescens* | LC |
| Fabaceae | *Lessertia* | *annularis* | | | LC |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Fabaceae | *Listia* | *heterophylla* | | | LC |
| Fabaceae | *Lotononis* | *carnosa* | subsp. | *carnosa* | LC |
| Fabaceae | *Lotononis* | *azureoides* | | | LC |
| Fabaceae | *Lotononis* | *pungens* | | | LC |
| Fabaceae | *Lotononis* | *falcata* | | | LC |
| Fabaceae | *Lotononis* | *caerulescens* | | | LC |
| Fabaceae | *Lotononis* | *rabenaviana* | | | LC |
| Fabaceae | *Medicago* | *sativa* | | | NE |
| Fabaceae | *Melilotus* | *indicus* | | | NE |
| Fabaceae | *Melolobium* | *canescens* | | | LC |
| Fabaceae | *Melolobium* | *candicans* | | | LC |
| Fabaceae | *Melolobium* | *obcordatum* | | | LC |
| Fabaceae | *Prosopis* | *glandulosa* | var. | *glandulosa* | NE |
| Fabaceae | *Trifolium* | *africanum* | var. | *africanum* | NE |
| Fabaceae | *Vachellia* | *karroo* | | | LC |
| Fumariaceae | *Fumaria* | *muralis* | subsp. | *muralis* | |
| Funariaceae | *Funaria* | *hygrometrica* | | | |
| Gentianaceae | *Chironia* | *palustris* | subsp. | *palustris* | LC |
| Gentianaceae | *Sebaea* | *natalensis* | | | LC |
| Geraniaceae | *Erodium* | *cicutarium* | | | |
| Geraniaceae | *Geranium* | *dregei* | | | LC |
| Geraniaceae | *Monsonia* | *camdeboensis* | | | LC |
| Geraniaceae | *Monsonia* | *crassicaulis* | | | LC |
| Geraniaceae | *Monsonia* | *salmoniflora* | | | LC |
| Geraniaceae | *Pelargonium* | *tragacanthoides* | | | LC |
| Geraniaceae | *Pelargonium* | *aridum* | | | LC |
| Geraniaceae | *Pelargonium* | *abrotanifolium* | | | LC |
| Geraniaceae | *Pelargonium* | *minimum* | | | LC |
| Geraniaceae | *Pelargonium* | *glutinosum* | | | LC |
| Geraniaceae | *Pelargonium* | *pseudofumarioides* | | | LC |
| Geraniaceae | *Pelargonium* | *alternans* | subsp. | *alternans* | LC |
| Geraniaceae | *Pelargonium* | *ramosissimum* | | | LC |
| Geraniaceae | *Pelargonium* | *nervifolium* | | | LC |
| Geraniaceae | *Pelargonium* | *griseum* | | | LC |
| Geraniaceae | *Pelargonium* | *senecioides* | | | LC |
| Geraniaceae | *Pelargonium* | *articulatum* | | | LC |
| Geraniaceae | *Pelargonium* | *odoratissimum* | | | LC |
| Geraniaceae | *Pelargonium* | *multicaule* | subsp. | *multicaule* | LC |
| Gisekiaceae | *Gisekia* | *pharnaceoides* | | | |
| Gisekiaceae | *Gisekia* | *pharnaceoides* | var. | *pharnaceoides* | LC |
| Grubbiaceae | *Grubbia* | *rosmarinifolia* | subsp. | *rosmarinifolia* | NE |
| Hyacinthaceae | *Albuca* | *suaveolens* | | | LC |
| Hyacinthaceae | *Albuca* | *exuviata* | | | LC |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Hyacinthaceae | *Albuca* | *prasina* | | | |
| Hyacinthaceae | *Albuca* | *virens* | subsp. | *arida* | LC |
| Hyacinthaceae | *Albuca* | sp. | | | |
| Hyacinthaceae | *Albuca* | *glandulosa* | | | LC |
| Hyacinthaceae | *Daubenya* | *marginata* | | | LC |
| Hyacinthaceae | *Dipcadi* | *ciliare* | | | LC |
| Hyacinthaceae | *Dipcadi* | *viride* | | | LC |
| Hyacinthaceae | *Drimia* | *anomala* | | | LC |
| Hyacinthaceae | *Drimia* | sp. | | | |
| Hyacinthaceae | *Drimia* | *intricata* | | | LC |
| Hyacinthaceae | *Drimia* | *platyphylla* | | | LC |
| Hyacinthaceae | *Ledebouria* | *apertiflora* | | | LC |
| Hyacinthaceae | *Ledebouria* | *revoluta* | | | LC |
| Hyacinthaceae | *Massonia* | *echinata* | | | LC |
| Hyacinthaceae | *Ornithogalum* | *juncifolium* | | | LC |
| Hyacinthaceae | *Ornithogalum* | *flexuosum* | | | LC |
| Hyacinthaceae | *Veltheimia* | *capensis* | | | LC |
| Hypoxidaceae | *Empodium* | *gloriosum* | | | LC |
| Hypoxidaceae | *Empodium* | *elongatum* | | | LC |
| Iridaceae | *Babiana* | *bainesii* | | | LC |
| Iridaceae | *Gladiolus* | *permeabilis* | subsp. | *edulis* | LC |
| Iridaceae | *Lapeirousia* | *plicata* | subsp. | *foliosa* | |
| Iridaceae | *Moraea* | *unguiculata* | | | LC |
| Iridaceae | *Moraea* | sp. | | | |
| Iridaceae | *Moraea* | *miniata* | | | LC |
| Iridaceae | *Moraea* | *ciliata* | | | LC |
| Iridaceae | *Romulea* | *atrandra* | var. | *esterhuyseniae* | LC |
| Iridaceae | *Tritonia* | *karooica* | | | LC |
| Juncaceae | *Juncus* | *punctorius* | | | LC |
| Juncaceae | *Juncus* | *capensis* | | | LC |
| Juncaceae | *Juncus* | *dregeanus* | subsp. | *dregeanus* | LC |
| Juncaceae | *Juncus* | *oxycarpus* | | | LC |
| Juncaceae | *Juncus* | *exsertus* | | | LC |
| Juncaceae | *Juncus* | *rigidus* | | | LC |
| Kewaceae | *Kewa* | *salsoloides* | | | LC |
| Lamiaceae | *Ballota* | *africana* | | | LC |
| Lamiaceae | *Lamium* | *amplexicaule* | | | |
| Lamiaceae | *Mentha* | *longifolia* | subsp. | *capensis* | LC |
| Lamiaceae | *Salvia* | *disermas* | | | LC |
| Lamiaceae | *Salvia* | *stenophylla* | | | |
| Lamiaceae | *Salvia* | *verbenaca* | | | LC |
| Lamiaceae | *Stachys* | *cuneata* | | | LC |
| Lamiaceae | *Stachys* | *linearis* | | | LC |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Lamiaceae | *Stachys* | *rugosa* | | | LC |
| Lamiaceae | *Teucrium* | *trifidum* | | | LC |
| Lentibulariaceae | *Utricularia* | *bisquamata* | | | LC |
| Leucobryaceae | *Campylopus* | *introflexus* | | | |
| Limeaceae | *Limeum* | *aethiopicum* | var. | *intermedium* | NE |
| Limeaceae | *Limeum* | *aethiopicum* | var. | *aethiopicum* | NE |
| Linaceae | *Linum* | *thunbergii* | | | LC |
| Lobeliaceae | *Lobelia* | *erinus* | | | LC |
| Lobeliaceae | *Lobelia* | *thermalis* | | | LC |
| Lobeliaceae | *Lobelia* | *dregeana* | | | LC |
| Loranthaceae | *Moquiniella* | *rubra* | | | LC |
| Loranthaceae | *Septulina* | *glauca* | | | LC |
| Lycopodiaceae | *Lycopodium* | *clavatum* | | | LC |
| Lythraceae | *Nesaea* | *anagalloides* | | | LC |
| Malvaceae | *Abutilon* | *sonneratianum* | | | LC |
| Malvaceae | *Anisodontea* | *malvastroides* | | | LC |
| Malvaceae | *Anisodontea* | *scabrosa* | | | LC |
| Malvaceae | *Anisodontea* | sp. | | | |
| Malvaceae | *Anisodontea* | *capensis* | | | LC |
| Malvaceae | *Anisodontea* | *triloba* | | | LC |
| Malvaceae | *Grewia* | *robusta* | | | LC |
| Malvaceae | *Hermannia* | *alnifolia* | | | LC |
| Malvaceae | *Hermannia* | *grandiflora* | | | LC |
| Malvaceae | *Hermannia* | *paucifolia* | | | LC |
| Malvaceae | *Hermannia* | *filifolia* | var. | *filifolia* | NE |
| Malvaceae | *Hermannia* | *stipulacea* | | | LC |
| Malvaceae | *Hermannia* | *pulchella* | | | LC |
| Malvaceae | *Hermannia* | *coccocarpa* | | | LC |
| Malvaceae | *Hermannia* | *filifolia* | var. | *grandicalyx* | NE |
| Malvaceae | *Hermannia* | *cuneifolia* | var. | *glabrescens* | LC |
| Malvaceae | *Hermannia* | *cuneifolia* | var. | *cuneifolia* | LC |
| Malvaceae | *Hermannia* | *vestita* | | | LC |
| Malvaceae | *Hermannia* | *burkei* | | | LC |
| Malvaceae | *Hermannia* | sp. | | | |
| Malvaceae | *Hermannia* | *erodioides* | | | LC |
| Malvaceae | *Hermannia* | *desertorum* | | | LC |
| Malvaceae | *Hermannia* | *spinosa* | | | LC |
| Malvaceae | *Hermannia* | *abrotanoides* | | | LC |
| Malvaceae | *Hermannia* | *althaeifolia* | | | LC |
| Malvaceae | *Hermannia* | *pulverata* | | | LC |
| Malvaceae | *Hermannia* | *linearifolia* | | | LC |
| Malvaceae | *Hermannia* | *comosa* | | | LC |
| Malvaceae | *Hermannia* | *bicolor* | | | LC |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Malvaceae | *Hibiscus* | *pusillus* | | | LC |
| Malvaceae | *Malva* | *parviflora* | var. | *parviflora* | |
| Malvaceae | *Melhania* | *rehmannii* | | | LC |
| Malvaceae | *Radyera* | *urens* | | | LC |
| Melianthaceae | *Melianthus* | *comosus* | | | LC |
| Menispermaceae | *Cissampelos* | *capensis* | | | LC |
| Molluginaceae | *Pharnaceum* | *confertum* | var. | *brachyphyllum* | LC |
| Molluginaceae | *Pharnaceum* | *detonsum* | | | LC |
| Nyctaginaceae | *Boerhavia* | *cordobensis* | | | |
| Oleaceae | *Menodora* | *juncea* | | | LC |
| Ophioglossaceae | *Ophioglossum* | *polyphyllum* | var. | *polyphyllum* | LC |
| Orchidaceae | *Eulophia* | *hians* | var. | *nutans* | LC |
| Orobanchaceae | *Harveya* | sp. | | | |
| Oxalidaceae | *Oxalis* | *obtusa* | | | LC |
| Oxalidaceae | *Oxalis* | *pes-caprae* | var. | *pes-caprae* | LC |
| Oxalidaceae | *Oxalis* | *heterophylla* | | | LC |
| Oxalidaceae | *Oxalis* | *setosa* | | | DD |
| Oxalidaceae | *Oxalis* | *psilopoda* | | | LC |
| Papaveraceae | *Papaver* | *aculeatum* | | | LC |
| Pedaliaceae | *Sesamum* | *capense* | | | LC |
| Peraceae | *Clutia* | sp. | | | |
| Peraceae | *Clutia* | *thunbergii* | | | LC |
| Plantaginaceae | *Plantago* | *lanceolata* | | | LC |
| Plantaginaceae | *Plantago* | *major* | | | |
| Plantaginaceae | *Veronica* | *persica* | | | NE |
| Plantaginaceae | *Veronica* | *anagallis-aquatica* | | | LC |
| Plumbaginaceae | *Limonium* | *sinuatum* | subsp. | *sinuatum* | |
| Poaceae | *Agrostis* | *lachnantha* | var. | *lachnantha* | LC |
| Poaceae | *Aristida* | *diffusa* | subsp. | *diffusa* | LC |
| Poaceae | *Aristida* | *diffusa* | subsp. | *burkei* | LC |
| Poaceae | *Aristida* | *adscensionis* | | | LC |
| Poaceae | *Brachiaria* | *marlothii* | | | LC |
| Poaceae | *Brachypodium* | *bolusii* | | | LC |
| Poaceae | *Bromus* | *catharticus* | | | NE |
| Poaceae | *Bromus* | *pectinatus* | | | LC |
| Poaceae | *Cenchrus* | *ciliaris* | | | LC |
| Poaceae | *Chaetobromus* | *involucratus* | subsp. | *dregeanus* | LC |
| Poaceae | *Cymbopogon* | *dieterlenii* | | | LC |
| Poaceae | *Cymbopogon* | *prolixus* | | | LC |
| Poaceae | *Cymbopogon* | *nardus* | | | LC |
| Poaceae | *Cynodon* | *dactylon* | | | LC |
| Poaceae | *Cynodon* | *incompletus* | | | LC |
| Poaceae | *Digitaria* | *argyrograpta* | | | LC |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Poaceae | *Digitaria* | *sanguinalis* | | | NE |
| Poaceae | *Digitaria* | *eriantha* | | | LC |
| Poaceae | *Echinochloa* | *colona* | | | LC |
| Poaceae | *Ehrharta* | *dura* | | | LC |
| Poaceae | *Ehrharta* | *erecta* | var. | *erecta* | LC |
| Poaceae | *Ehrharta* | *calycina* | | | LC |
| Poaceae | *Ehrharta* | *delicatula* | | | LC |
| Poaceae | *Enneapogon* | *desvauxii* | | | LC |
| Poaceae | *Enneapogon* | *cenchroides* | | | LC |
| Poaceae | *Enneapogon* | *scaber* | | | LC |
| Poaceae | *Eragrostis* | *chloromelas* | | | LC |
| Poaceae | *Eragrostis* | *lehmanniana* | var. | *lehmanniana* | LC |
| Poaceae | *Eragrostis* | *bicolor* | | | LC |
| Poaceae | *Eragrostis* | *procumbens* | | | LC |
| Poaceae | *Eragrostis* | *obtusa* | | | LC |
| Poaceae | *Eragrostis* | *homomalla* | | | LC |
| Poaceae | *Eragrostis* | *cilianensis* | | | LC |
| Poaceae | *Eragrostis* | *curvula* | | | LC |
| Poaceae | *Eragrostis* | *mexicana* | subsp. | *virescens* | NE |
| Poaceae | *Festuca* | *scabra* | | | LC |
| Poaceae | *Fingerhuthia* | *sesleriiformis* | | | LC |
| Poaceae | *Fingerhuthia* | *africana* | | | LC |
| Poaceae | *Helictotrichon* | *hirtulum* | | | LC |
| Poaceae | *Helictotrichon* | sp. | | | |
| Poaceae | *Heteropogon* | *contortus* | | | LC |
| Poaceae | *Hordeum* | *capense* | | | LC |
| Poaceae | *Hordeum* | *murinum* | subsp. | *glaucum* | NE |
| Poaceae | *Hyparrhenia* | *hirta* | | | LC |
| Poaceae | *Leptochloa* | *fusca* | | | LC |
| Poaceae | *Lolium* | *rigidum* | | | NE |
| Poaceae | *Lolium* | *perenne* | | | NE |
| Poaceae | *Lolium* | *multiflorum* | | | NE |
| Poaceae | *Melica* | *racemosa* | | | LC |
| Poaceae | *Melica* | *decumbens* | | | LC |
| Poaceae | *Oropetium* | *capense* | | | LC |
| Poaceae | *Panicum* | *maximum* | | | LC |
| Poaceae | *Panicum* | sp. | | | |
| Poaceae | *Paspalum* | *dilatatum* | | | NE |
| Poaceae | *Pennisetum* | *sphacelatum* | | | LC |
| Poaceae | *Pentameris* | *airoides* | subsp. | *airoides* | LC |
| Poaceae | *Pentameris* | *aristifolia* | | | LC |
| Poaceae | *Phragmites* | *australis* | | | LC |
| Poaceae | *Polypogon* | *monspeliensis* | | | NE |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Poaceae | *Schismus* | *barbatus* | | | LC |
| Poaceae | *Setaria* | *verticillata* | | | LC |
| Poaceae | *Setaria* | *sphacelata* | var. | *torta* | LC |
| Poaceae | *Sorghum* | sp. | | | |
| Poaceae | *Sporobolus* | *ioclados* | | | LC |
| Poaceae | *Sporobolus* | *fimbriatus* | | | LC |
| Poaceae | *Sporobolus* | *tenellus* | | | LC |
| Poaceae | *Sporobolus* | *fourcadii* | | | LC |
| Poaceae | *Stipagrostis* | *ciliata* | var. | *capensis* | LC |
| Poaceae | *Stipagrostis* | *obtusa* | | | LC |
| Poaceae | *Stipagrostis* | *namaquensis* | | | LC |
| Poaceae | *Tenaxia* | *disticha* | | | |
| Poaceae | *Tetrachne* | *dregei* | | | LC |
| Poaceae | *Themeda* | *triandra* | | | LC |
| Poaceae | *Tragus* | *koelerioides* | | | LC |
| Poaceae | *Tragus* | *racemosus* | | | LC |
| Poaceae | *Tragus* | *berteronianus* | | | LC |
| Poaceae | *Tribolium* | *purpureum* | | | LC |
| Poaceae | *Tricholaena* | *capensis* | subsp. | *capensis* | LC |
| Polygalaceae | *Muraltia* | *macrocarpa* | | | LC |
| Polygalaceae | *Polygala* | *leptophylla* | var. | *leptophylla* | LC |
| Polygalaceae | *Polygala* | *ephedroides* | | | LC |
| Polygalaceae | *Polygala* | sp. | | | |
| Polygalaceae | *Polygala* | *hottentotta* | | | LC |
| Polygalaceae | *Polygala* | *ericaefolia* | | | LC |
| Polygalaceae | *Polygala* | *asbestina* | | | LC |
| Polygonaceae | *Polygonum* | *aviculare* | | | |
| Polygonaceae | *Rumex* | *crispus* | | | |
| Polygonaceae | *Rumex* | *lanceolatus* | | | LC |
| Portulacaceae | *Portulaca* | *oleracea* | | | |
| Potamogetonaceae | *Potamogeton* | *pusillus* | | | LC |
| Potamogetonaceae | *Zannichellia* | *palustris* | | | LC |
| Pteridaceae | *Adiantum* | *capillus-veneris* | | | LC |
| Pteridaceae | *Cheilanthes* | *hirta* | var. | *brevipilosa* | |
| Pteridaceae | *Cheilanthes* | *hirta* | var. | *hirta* | LC |
| Pteridaceae | *Cheilanthes* | *induta* | | | LC |
| Pteridaceae | *Cheilanthes* | *eckloniana* | | | LC |
| Pteridaceae | *Pellaea* | *calomelanos* | var. | *calomelanos* | LC |
| Pteridaceae | *Pellaea* | *rufa* | | | LC |
| Ranunculaceae | *Clematis* | *brachiata* | | | LC |
| Ranunculaceae | *Ranunculus* | *multifidus* | | | LC |
| Ranunculaceae | *Ranunculus* | *trichophyllus* | | | LC |
| Ricciaceae | *Riccia* | *albovestita* | | | |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Rosaceae | *Rubus* | *ludwigii* | subsp. | *ludwigii* | LC |
| Rubiaceae | *Anthospermum* | *rigidum* | subsp. | *pumilum* | LC |
| Rubiaceae | *Anthospermum* | *dregei* | subsp. | *dregei* | LC |
| Rubiaceae | *Galium* | *capense* | subsp. | *capense* | LC |
| Rubiaceae | *Kohautia* | *caespitosa* | subsp. | *brachyloba* | LC |
| Rubiaceae | *Kohautia* | *cynanchica* | | | LC |
| Rubiaceae | *Nenax* | *microphylla* | | | LC |
| Ruscaceae | *Eriospermum* | *corymbosum* | | | LC |
| Rutaceae | *Agathosma* | *cerefolium* | | | LC |
| Rutaceae | *Ruta* | *graveolens* | | | |
| Salicaceae | *Populus* | *nigra* | var. | *italica* | |
| Salicaceae | *Salix* | *mucronata* | subsp. | *mucronata* | LC |
| Santalaceae | *Lacomucinaea* | *lineata* | | | |
| Santalaceae | *Thesium* | *sonderianum* | | | DD |
| Santalaceae | *Thesium* | *junceum* | var. | *junceum* | LC |
| Santalaceae | *Thesium* | *disciflorum* | | | LC |
| Santalaceae | *Viscum* | *hoolei* | | | LC |
| Santalaceae | *Viscum* | *rotundifolium* | | | LC |
| Santalaceae | *Viscum* | *continuum* | | | LC |
| Scrophulariaceae | *Aptosimum* | *procumbens* | | | LC |
| Scrophulariaceae | *Aptosimum* | *spinescens* | | | LC |
| Scrophulariaceae | *Aptosimum* | *indivisum* | | | LC |
| Scrophulariaceae | *Buddleja* | *glomerata* | | | LC |
| Scrophulariaceae | *Buddleja* | *salviifolia* | | | LC |
| Scrophulariaceae | *Chaenostoma* | *archeri* | | | LC |
| Scrophulariaceae | *Chaenostoma* | *halimifolium* | | | LC |
| Scrophulariaceae | *Chaenostoma* | sp. | | | |
| Scrophulariaceae | *Chaenostoma* | *macrosiphon* | | | LC |
| Scrophulariaceae | *Chaenostoma* | *pauciflorum* | | | LC |
| Scrophulariaceae | *Chaenostoma* | *revolutum* | | | LC |
| Scrophulariaceae | *Chaenostoma* | *rotundifolium* | | | LC |
| Scrophulariaceae | *Cromidon* | *decumbens* | | | LC |
| Scrophulariaceae | *Cromidon* | sp. | | | |
| Scrophulariaceae | *Diascia* | sp. | | | |
| Scrophulariaceae | *Diascia* | *capsularis* | | | LC |
| Scrophulariaceae | *Diascia* | *alonsooides* | | | LC |
| Scrophulariaceae | *Gomphostigma* | *virgatum* | | | LC |
| Scrophulariaceae | *Gomphostigma* | *incomptum* | | | LC |
| Scrophulariaceae | *Hebenstretia* | *glaucescens* | | | LC |
| Scrophulariaceae | *Jamesbrittenia* | sp. | | | |
| Scrophulariaceae | *Jamesbrittenia* | *filicaulis* | | | LC |
| Scrophulariaceae | *Jamesbrittenia* | *tysonii* | | | LC |
| Scrophulariaceae | *Jamesbrittenia* | *atropurpurea* | subsp. | *atropurpurea* | LC |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Scrophulariaceae | *Jamesbrittenia* | *atropurpurea* | | | |
| Scrophulariaceae | *Limosella* | *grandiflora* | | | LC |
| Scrophulariaceae | *Manulea* | *karrooica* | | | LC |
| Scrophulariaceae | *Manulea* | *chrysantha* | | | LC |
| Scrophulariaceae | *Nemesia* | *cynanchifolia* | | | LC |
| Scrophulariaceae | *Nemesia* | sp. | | | |
| Scrophulariaceae | *Nemesia* | *fruticans* | | | LC |
| Scrophulariaceae | *Nemesia* | *linearis* | | | LC |
| Scrophulariaceae | *Peliostomum* | *leucorrhizum* | | | LC |
| Scrophulariaceae | *Selago* | *rigida* | | | LC |
| Scrophulariaceae | *Selago* | *albida* | | | LC |
| Scrophulariaceae | *Selago* | *saxatilis* | | | LC |
| Scrophulariaceae | *Selago* | *acocksii* | | | LC |
| Scrophulariaceae | *Selago* | *centralis* | | | LC |
| Scrophulariaceae | *Selago* | *gracilis* | | | LC |
| Scrophulariaceae | *Selago* | sp. | | | |
| Scrophulariaceae | *Selago* | *magnakarooica* | | | LC |
| Scrophulariaceae | *Selago* | *geniculata* | | | LC |
| Scrophulariaceae | *Selago* | *divaricata* | | | LC |
| Scrophulariaceae | *Zaluzianskya* | sp. | | | |
| Scrophulariaceae | *Zaluzianskya* | *venusta* | | | LC |
| Solanaceae | *Lycium* | *oxycarpum* | | | LC |
| Solanaceae | *Lycium* | *schizocalyx* | | | LC |
| Solanaceae | *Lycium* | *hirsutum* | | | LC |
| Solanaceae | *Lycium* | *bosciifolium* | | | LC |
| Solanaceae | *Lycium* | *cinereum* | | | LC |
| Solanaceae | *Lycium* | *horridum* | | | LC |
| Solanaceae | *Nicotiana* | *glauca* | | | |
| Solanaceae | *Solanum* | *burchellii* | | | LC |
| Solanaceae | *Solanum* | *nigrum* | | | |
| Solanaceae | *Solanum* | *retroflexum* | | | LC |
| Solanaceae | *Solanum* | *capense* | | | LC |
| Solanaceae | *Solanum* | *tomentosum* | | | |
| Solanaceae | *Withania* | *somnifera* | | | LC |
| Thymelaeaceae | *Gnidia* | *meyeri* | | | LC |
| Thymelaeaceae | *Lasiosiphon* | *deserticola* | | | LC |
| Thymelaeaceae | *Passerina* | *obtusifolia* | | | LC |
| Thymelaeaceae | *Passerina* | *corymbosa* | | | LC |
| Urticaceae | *Forsskaolea* | *candida* | | | LC |
| Urticaceae | *Urtica* | *urens* | | | |
| Urticaceae | *Urtica* | *dioica* | | | |
| Verbenaceae | *Chascanum* | *pumilum* | | | LC |
| Verbenaceae | *Chascanum* | *pinnatifidum* | var. | *pinnatifidum* | LC |

| Family | Genus | Species | Rank | Subspecies | IUCN Status[5] |
|---|---|---|---|---|---|
| Zygophyllaceae | *Augea* | *capensis* | | | LC |
| Zygophyllaceae | *Roepera* | *incrustata* | | | |
| Zygophyllaceae | *Roepera* | *foetida* | | | |
| Zygophyllaceae | *Roepera* | *lichtensteiniana* | | | |
| Zygophyllaceae | *Tetraena* | *chrysopteron* | | | |
| Zygophyllaceae | *Tetraena* | *microcarpa* | | | |
| Zygophyllaceae | *Tribulus* | *terrestris* | | | LC |

## *10 ANNEX 2. LIST OF MAMMALS*

List of mammals which are likely to occur in the broad vicinity of the Hoogland North Wind Farm study area. Records are based on the MammalMap Database from the ADU (http://mammalmap.adu.org.za), while conservation status is from the IUCN Red Lists 2016. Species in bold are those confirmed present or observed at the site.

| Family | Scientific name | Common name | Red list | Records |
|---|---|---|---|---|
| **Bathyergidae** | ***Cryptomys hottentotus*** | **Southern African Mole-rat** | **Least Concern** | **3** |
| **Bovidae** | ***Antidorcas marsupialis*** | **Springbok** | **Least Concern** | **978** |
| **Bovidae** | ***Oreotragus oreotragus*** | **Klipspringer** | **Least Concern** | **503** |
| Bovidae | *Pelea capreolus* | Grey Rhebok | Near Threatened | 357 |
| **Bovidae** | ***Raphicerus campestris*** | **Steenbok** | **Least Concern** | **76** |
| **Bovidae** | ***Redunca fulvorufula*** | **Mountain Reedbuck** | **Near Threatened** | **91** |
| **Bovidae** | ***Sylvicapra capra*** | **Common Duiker** | **Least Concern** | **18** |
| **Bovidae** | ***Tragelaphus strepsiceros*** | **Greater Kudu** | **Least Concern** | **624** |
| **Canidae** | ***Canis mesomelas*** | **Black-backed Jackal** | **Least Concern** | **51** |
| **Canidae** | ***Otocyon megalotis*** | **Bat-eared Fox** | **Least Concern** | **12** |
| **Canidae** | ***Vulpes chama*** | **Cape Fox** | **Least Concern** | **4** |
| Cercopithecidae | *Chlorocebus pygerythrus* | Vervet Monkey | Least Concern | 1 |
| **Cercopithecidae** | ***Papio ursinus*** | **Chacma Baboon** | **Least Concern** | **57** |
| Chrysochloridae | *Chlorotalpa sclateri* | Sclater's Golden Mole | Least Concern | 14 |
| **Felidae** | ***Caracal caracal*** | **Caracal** | **Least Concern** | **2** |
| Felidae | *Felis nigripes* | Black-footed Cat | Vulnerable | 17 |
| **Felidae** | ***Felis silvestris*** | **Wildcat** | **Least Concern** | **3** |
| Gliridae | *Graphiurus ocularis* | Spectacled African Dormouse | Least Concern | 1 |
| **Herpestidae** | ***Atilax paludinosus*** | **Marsh Mongoose** | **Least Concern** | **2** |
| **Herpestidae** | ***Cynictis penicillata*** | **Yellow Mongoose** | **Least Concern** | **6** |
| **Herpestidae** | ***Herpestes pulverulentus*** | **Cape Gray Mongoose** | **Least Concern** | **7** |
| **Herpestidae** | ***Suricata suricatta*** | **Meerkat** | **Least Concern** | **5** |
| Hyaenidae | *Hyaena brunnea* | Brown Hyena | Near Threatened | 2 |
| **Hyaenidae** | ***Proteles cristata*** | **Aardwolf** | **Least Concern** | **4** |
| **Hystricidae** | ***Hystrix africaeaustralis*** | **Cape Porcupine** | **Least Concern** | **4** |
| **Leporidae** | ***Bunolagus monticularis*** | **Riverine Rabbit** | **Critically Endangered** | **11** |
| **Leporidae** | ***Lepus capensis*** | **Cape Hare** | **Least Concern** | **2** |
| **Leporidae** | ***Lepus saxatilis*** | **Scrub Hare** | **Least Concern** | **3** |
| Macroscelididae | *Macroscelides proboscideus* | Short-eared Elephant Shrew | Least Concern | 6 |
| Muridae | *Aethomys granti* | Grant's Rock Mouse | Least Concern | 2 |

| | | | | |
|---|---|---|---|---|
| **Muridae** | ***Aethomys namaquensis*** | **Namaqua Rock Mouse** | **Least Concern** | **29** |
| Muridae | *Desmodillus auricularis* | Cape Short-tailed Gerbil | Least Concern | 2 |
| Muridae | *Gerbilliscus paeba* | Paeba Hairy-footed Gerbil | Least Concern | 13 |
| Muridae | *Mastomys coucha* | Southern African Mastomys | Least Concern | 1 |
| Muridae | *Mastomys natalensis* | Natal Mastomys | Least Concern | 6 |
| **Muridae** | ***Otomys unisulcatus*** | **Karoo Bush Rat** | **Least Concern** | **12** |
| Muridae | *Parotomys brantsii* | Brants's Whistling Rat | Least Concern | 2 |
| Muridae | *Rhabdomys pumilio* | Xeric Four-striped Grass Rat | Least Concern | 51 |
| **Mustelidae** | ***Ictonyx striatus*** | **Striped Polecat** | **Least Concern** | **3** |
| Mustelidae | *Mellivora capensis* | Honey Badger | Least Concern | 3 |
| Nesomyidae | *Malacothrix typica* | Large-eared African Desert Mouse | Least Concern | 2 |
| Nesomyidae | *Petromyscus collinus* | Pygmy Rock Mouse | Least Concern | 2 |
| Nesomyidae | *Saccostomus campestris* | Southern African Pouched Mouse | Least Concern | 15 |
| **Orycteropodidae** | ***Orycteropus afer*** | **Aardvark** | **Least Concern** | **3** |
| **Procaviidae** | ***Procavia capensis*** | **Cape Rock Hyrax** | **Least Concern** | **13** |
| **Sciuridae** | ***Xerus inauris*** | **South African Ground Squirrel** | **Least Concern** | **1** |
| Soricidae | *Myosorex varius* | Forest Shrew | Least Concern | 13 |
| **Viverridae** | ***Genetta genetta*** | **Common Genet** | **Least Concern** | **2** |