LOXTON WIND ENERGY FACILITY 1

PLANT SPECIES COMPLIANCE STATEMENT

PRODUCED FOR ATLANTIC RENEWABLE ENERGY PARTNERS

ON BEHALF OF LOXTON WIND FACILITY 1 (PTY) LTD

3Foxes Biodiversity Solutions

Simon.Todd@3foxes.co.za

April 2023

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PLANT SPECIES COMPLIANCE STATEMENT

EXECUTIVE SUMMARY

The applicant, Loxton Wind Facility 1 (Pty) Ltd is proposing the development of a commercial Wind Energy Facility (WEF) and associated infrastructure on a ca. 7600 ha site located approximately 17 km North of Loxton within the Ubuntu Local Municipality and the Pixley Ka Seme District Municipality in the Northern Cape Province. Loxton WEF 1 will comprise of up to 38 turbines, with a contracted capacity of up to 240MW with a permanent footprint of approximately 65 ha. The Applicant has appointed 3Foxes Biodiversity Solutions to provide a Plant Compliance Statement for the development as part of the EIA application for the development.

The DFFE Screening Tool indicates that the site has a low sensitivity for the Plant Species Theme and the field assessment was able to confirm that there are no significant vegetation features or plant SCC within the development footprint. The vegetation within the footprint is typical for the area and consists of low shrubland on open plains representative of the Eastern Upper Karoo, Upper Karoo Hardeveld and Southern Karoo Riviere vegetation types. No plant species of concern were observed within the site. The site is therefore considered to be low sensitivity from a Plant Species Theme perspective.

This Plant Species Theme Compliance Statement therefore finds that the footprint of the Loxton Wind Energy Facility 1 is restricted to low sensitivity areas with no observed plant species of conservation concern present, and as such, there are no reasons to oppose the Loxton Wind Energy Facility 1.

environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

Loxton Wind Energy Facility 1

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	3Foxes Biodiversity Solutions			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition	100%
Specialist name:	Simon Todd			
Specialist Qualifications:	BSc. (Zool. & Bot.), BSc Hons (Zool.), MSc (Cons. Biol.)			
Professional affiliation/registration:	SACNASP 400425/11			
Physical address:	23 De Villiers Road, Kommetjie 7975			
Postal address:	23 De Villiers Road, Kommetjie			
Postal code:	7975	Cell:	082 3326502	
Telephone:		Fax:		
E-mail:	Simon.Todd@3foxes.co.za			

2. DECLARATION BY THE SPECIALIST

I, ___Simon Todd_____, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist

3Foxes Biodiversity Solutions

Name of Company:

25 October 2022

Date:

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, ___Simon Todd_____, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

3Foxes Biodiversity Solutions

Name of Company

25 October 2022

Date

Signature of the Commissioner of Oaths

Date

SHORT CV/SUMMARY OF EXPERTISE – SIMON TODD

Simon Todd Pr.Sci.Nat
Director & Principle Scientist
C: 082 3326502
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Kommetjie
7975

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.

Relevant Recent Studies Requiring Similar Expertise to the Current Project

- Beaufort West PV Facility. Fauna & Flora Assessment. SiVest Evironmental 2022.
- San Solar PV Facility, Kathu. Fauna & Flora Assessment. Savannah Environmental 2022.
- Soventix Phase 3 PV Facility, De Aar. Fauna & Flora Assesment. Ecologes Environmental Consultants, 2022.
- Sadawa PV Facilities, Tankwa Karoo. Fauna & Flora Assessment. Savannah Environmental 2021.
- Kotulo Tsatsi PV 1 Facility near Kenhardt. Fauna & Flora Assessment. Savannah Environmental 2021.
- Hyperion 2 PV Facility, Kathu. Fauna & Flora Assessment. Savannah Environmental 2021.

Loxton Wind Energy Facility 1
Plant Species Compliance Statement

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Plant Species Theme Compliance Statement

1. INTRODUCTION

The applicant, Loxton Wind Facility 1 (Pty) Ltd is proposing the development of a commercial Wind Energy Facility (WEF) and associated infrastructure on a ca. 7600 ha site located approximately 17 km North of Loxton within the Ubuntu Local Municipality and the Pixley Ka Seme District Municipality in the Northern Cape Province. Two additional WEF's are concurrently being considered on the surrounding properties and are assessed by way of separate impact assessment. These projects are known as Loxton WEF 2 and Loxton WEF 3. A preferred project site with an extent of approximately 58 000 ha has been identified as a technically suitable area for the development of the three WEF projects. Loxton WEF 1 will comprise of up to 38 turbines, with a contracted capacity of up to 240MW with a permanent footprint of up to 65 ha.

As part of the required studies for the required Scoping and EIA application for environmental authorisation, 3Foxes Biodiversity Solutions has been appointed to provide terrestrial ecological input for the development application. The DFFE Screening Tool indicates that the site falls within an area with Low Sensitivity under the Plant Species Theme. The site verification was able to confirm this low sensitivity and no plant SCC were observed on the site. Consequently, in terms of the regulations, a Plant Species Compliance Statement is the recommended level of study for the EIA process. To these ends, this Plant Species Compliance Statement for the Loxton Wind Energy Facility 1, addresses the potential impacts of the project on vegetation and plant species and must be included in the EIA for the development and any mitigation and monitoring measures as identified, must be incorporated into the EMPr for the development.

1.1 Scope and Objectives

In terms of the GN 1150 30 October 2020, *Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(A) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation*, the Terrestrial Plant Species Compliance Statement should include the following details:

- The compliance statement must be prepared by a SACNASP registered specialist under one of the two fields of practice (Botanical Science or Ecological Science).
- The compliance statement must:
  - be applicable within the study area;
  - confirm that the study area is of "low" sensitivity for terrestrial plant species; and
  - indicate whether or not the proposed development will have any impact on SCC.
- The compliance statement must contain, as a minimum, the following information:

- contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the compliance statement including a curriculum vitae;
- a signed statement of independence by the specialist;
- a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;
- a description of the methodology used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant;
- where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion in the EMPr;
- a description of the assumptions made and any uncertainties or gaps in knowledge or data;
- the mean density of observations/ number of samples sites per unit area; and
- any conditions to which the compliance statement is subjected.

- A signed copy of the Terrestrial Plant Species Compliance Statement must be appended to the Basic Assessment Report or the Environmental Impact Assessment Report.

2. TECHNICAL DESCRIPTION

2.1 Project Description

The Loxton Wind Energy Facility 1 is part of the Loxton Wind Energy Facilities cluster and is located east of the R63, approximately 18km north of Loxton in the Northern Cape. The draft turbine layout and location of the Loxton Wind Energy Facility 1 is illustrated below in Figure 1. The facility includes 38 potential turbine locations. A summary of the project components and their estimated footprint areas is provided below in Table 1.

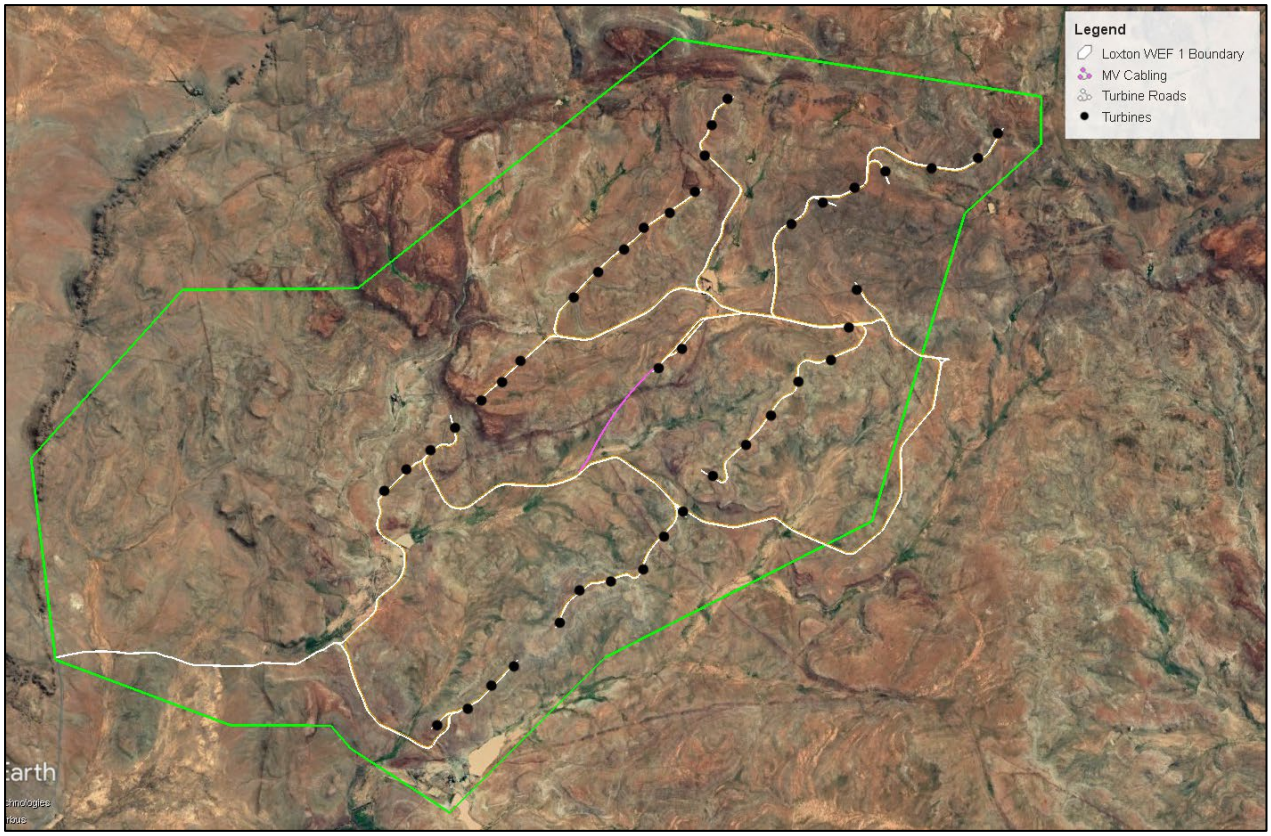

Figure 1. Satellite image showing the location and layout of the proposed Loxton Wind Energy Facility 1 north of Loxton, within the Northern Cape.

Table 1: Summary of the components, specifications, and approximate areas of impact of the Loxton Wind Energy Facility 1.

Project Components	Description
Location	17 km North of Loxton in the Northern Cape
Access	Access to the proposed development shall be from the R63.
Extent	The total area of the site being considered for developing the wind farm:65ha
Number of wind turbines and generation capacity	Up to a maximum of 38 wind turbines per wind farm will be developed. The targeted nameplate generation capacity for the wind farm is up to a maximum of 240 MW.
Wind turbine specifications	● Rotor diameter: 100 m to 195 m (50 m to 97.5 m blade / radius) ● Hub height: upto 200m ● Rotor top tip height: up to 300m (maximum based on 200 m hub + 100 m blade = 300 m) ● Rotor bottom tip height: minimum of 25 m (and not lower).
Turbine Foundations	Each turbine will have a circular foundation with a diameter of up to 32 m and this will be placed alongside the 45 m wide hardstand resulting in an area of about 32 m x 45 m that will be permanently disturbed for the turbine foundation. The combined permanent footprint for the turbine foundations will be approximately 4.4 ha.
Turbine Hardstands and Laydown Areas	Each turbine will have a permanent crane pad of 70 m x 45 m placed adjacent to each turbine foundation. The total permanent footprints are as follows:

Project Components	Description
	Each turbine will have a hardstand of 80 m x 45 m. Individual turbine temporary laydown areas including crane boom laydown areas, blade laydown areas and other potential temporary areas will be up to a maximum of 6000 m2 per a turbine. A total footprint of approx. 18 ha (temporary).
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.
	Where it has been possible, cables have been routed along existing local roads. 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.
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.
Site roads	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. The permanent footprint of the road network for the wind farm is approx. 50km.
	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.
Wind farm Substations	The wind farm will have a substation yard of up to 2ha that will include an Operation and Maintenance (O&M) building, Substation building and a High Voltage Gantry.

Project Components	Description
Battery energy storage system (BESS)	The wind farm will also potentially have a ±5ha area for a battery energy storage system (BESS) which may be adjacent or slightly removed from the substation depending on the local constraints. 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.
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.
Security	Security gate and hut to be installed at entrances to the wind farm site No fencing around individual turbines, existing fencing shall remain around perimeter of properties. Temporary and permanent yard areas to be enclosed (with access control) with an up to 2.4 m high fence.
Temporary areas required for the construction / decommissioning phase	The wind farm will have the following temporary construction areas: ● Temporary site camp/s areas of up to 2ha ● Batching plant area of up to 1ha ● General laydown area of up to 6ha m^2 ● Bunded fuel & lubricants storage facility at the site camp

3. ASSESSMENT METHODOLOGY

3.1 Site Visits

The site was visited on numerous occasions for the current study including the following dates:

- 23-24 May 2021
- 16-18 June 2022
- 01 July 2022
- 10-11 August 2022
- 07 September 2022
- 10 October 2022

During the site visits, the wind farm site was extensively investigated. 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.

3.2 Data Sourcing and Review

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

- Vegetation types and their conservation status were extracted from the South African National Vegetation Map (2018 update).
- Information on plant 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.
- 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 (2022).

4. ASSUMPTIONS AND LIMITATIONS

Conditions at the time of the initial 2 surveys were relatively poor as these took place during an extended drought the area and wider Karoo was experiencing. However by July 2022 rains had began and by October 2022 the area was exceptionally wet. As a result, the conditions during the extended field assessment are considered favourable and the abundance of annuals and geophytes as relatively high, with many species growing or in flower by the end of 2022. Although the wind farm area is large with the result that not all areas could be sampled in detail, the project footprint area is considered to have been well-covered and it is highly unlikely that there are any significant vegetation features present that would not have been observed during the study. Given the favourable conditions at the time of the site visits, there are few limitations and assumptions required with regards to the vegetation of the site and the presence of plant SCC within the wind farm development footprint.

5. LEGAL REQUIREMENT AND GUIDELINES

5.1 National Permitting

In terms of national permits, a protected tree clearing permit is potentially required under the National Forests Act. The Notice of the List of Protected Tree Species Under the National Forests Act, 1998 (ACT NO 84 OF 1998) can be obtained from this location: https://www.gov.za/documents/national-forests-act-list-protected-tree-species-7. This list has not been changed since it was last published in 2014. However, no protected tree species were observed present within the site and as such, no tree clearing permit would be required.

Threatened Or Protected Species (TOPS) permits for the carrying out of restricted activities in terms of the National Environmental Management: Biodiversity Act 2004 (No. 10 of 2004) may be required. However, TOPS permits are submitted to either the national minister or the provincial minister. In terms of the legislation, the relevant issuing authority for the current project would be the office of the MEC of the province.

The most recent lists of TOPS species and associated legislation is available in the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), Threatened or Protected Species Regulations Notice 255 of 2015. In addition to these species, SANBI maintains a national list of the IUCN conservation status of all plant species in South Africa. Any endangered (VU, EN, CR) species under this list are also subject to the TOPS regulations.

5.2 Provincial Permitting

In terms of Northern Cape provincial permits, a protected flora clearing permit from DENC would be required. This permit must list the number and location of all individuals of protected plants as listed in the provincial ordinance (Northern Cape Nature Conservation Act, 2009) as well as those plants listed as being of conservation concern by the Red List of South African Plants (http://redlist.sanbi.org/index.php).

This permit requires a full walk-through of the final approved wind farm development footprint, following which the number of individuals of protected species that would be affected by the development can be quantified and used to populate the permit application. Depending on the identity of the species concerned, some would be destroyed, while other species would need to be translocated within the site to a safe site outside the development footprint, based on the recommendations of the walk-through study.

6. DESCRIPTION OF THE RECEIVING ENVIRONMENT

According to the Veg Map, the Loxton Wind Energy Facility 1 footprint falls entirely within the Eastern Upper Karoo vegetation type (***Figure 2***). However, the field assessment indicates that there are areas of Upper Karoo Hardeveld within the site associated with the rocky hills present as well as Southern Karoo Riviere along the major drainage lines of the site. These different vegetation types are illustrated and described below. A full plant species for the site was developed and is provided in Annex 1. More than 250 plant species were encountered within the site during the field assessment, which indicates the relatively favourable conditions at the time of the sampling.

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, the vegetation is relatively homogenous, although there is some variation in which species are dominant depending on soil depth and the degree of rockiness. Dominant and characteristic species observed at the site include low woody shrubs such as *Pentzia incana*, *Ruschia spinosa*, *Pentzia globosa*, *Plinthus karooicus*, *Pteronia adenocarpa*, *Pteronia glomerata*, *Pteronia incana*, , *Tetragonia arbuscula*, *Salsola rabieana*, *Asparagus glaucus*, *Asparagus capensis*, *Euryops lateriflorus*, *Eriocephalus ericoides*, *Eriocephalus spinescens*, *Lycium cinereum*; forbs such as *Arctotis leiocarpa*, *Aptosimum indivisum*, *Nemesia fruticans*, *Heliophila suavissima* and *Chenopodium album*; grasses such as *Aristida adscensionis*, *Aristida diffusa*, *Enneapogon desvauxii*, *Eragrostis lehmanniana*, *Eragrostis obtusa*, *Stipagrostis obtusa* and *Tragus berteronianus*.

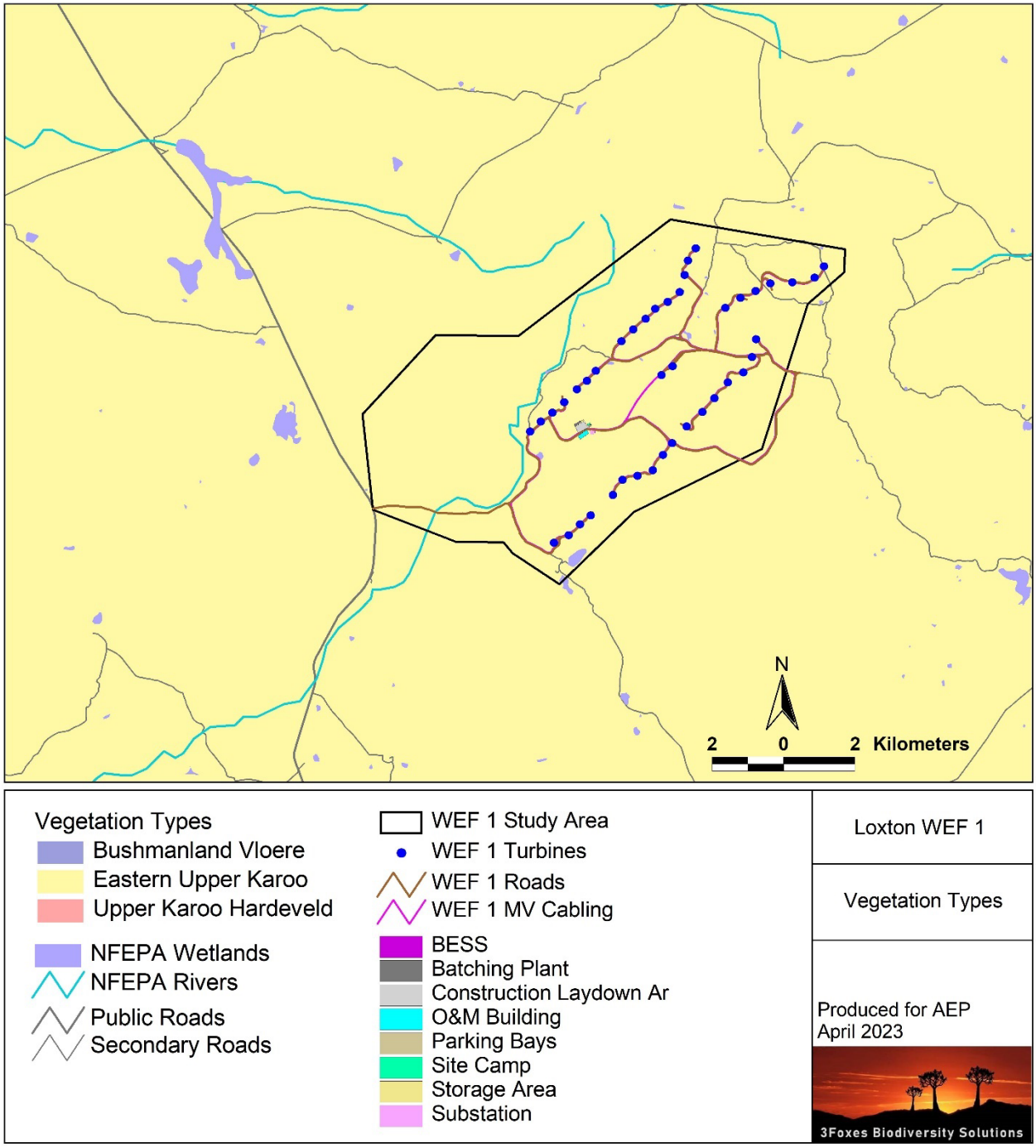

Figure 2. Vegetation map of the broader Loxton Wind Energy Facility 1 area, showing that the VegMap indicates that the site falls entirely within the Eastern Upper Karoo vegetation type.

Figure 3. Typical open plains within the Loxton Wind Energy Facility 1 project area, representative of the Eastern Upper Karoo vegetation type.

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 Loxton WEF 1 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. Although it contains a higher diversity of species than the adjacent areas of Eastern Upper Karoo, no red-listed plant species were observed within these areas. Common and dominant species present include *Diospyros austro-africana*, *Searsia burchellii, Chrysocoma ciliata, Eriocephalus ericoides subsp. ericoides (d), Euryops lateriflorus, Limeum aethiopicum, Pteronia glauca, Asparagus suaveolens, Euryops annae, Felicia muricata, Felicia filifolia subsp. filifolia,*

Helichrysum lucilioides, Helichrysum zeyheri, Hermannia filifolia var. filifolia, Hermannia pulchella, Jamesbrittenia atropurpurea, Lessertia frutescens, Melolobium candicans, Microloma armatum, Pegolettia retrofracta, Pelargonium abrotanifolium, Pentzia globosa, Selago albida, Solanum capense, Sutera halimifolia, Aloe broomii, Drosanthemum lique, Thesium lineatum, Boophone disticha, Cheilanthes bergiana, Aristida adscensionis, Aristida diffusa, Enneapogon desvauxii, Eragrostis lehmanniana, Eragorostis obtusa, Digitaria eriantha, Enneapogon scaber, Eragrostis curvula, Fingerhuthia africana, Tragus berteronianus and *Tragus koelerioides*. Thus, while the rocky hills are considered sensitive from an overall ecological perspective, they are considered low sensitivity for plant species as no plant SCC were observed within the site within these areas.

Figure 4. The dolerite rocky hills of the Loxton WEF 1 are considered to represent the Upper Karoo Hardeveld vegetation type.

Although there are no areas of this vegetation type within the site that have been mapped in the VegMap, the vegetation along the major rivers within the Loxton WEF 1 site corresponds 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 *Vachellia karroo, Searsia lancea, Cenchrus ciliaris, Searsia burchellii, Melianthus comosus, Lycium oxycarpum, Sporobolus ioclados, Helichrysum pentzioides, Drosanthemum lique, Pentzia globosa,*

Salsola aphylla, Tribulis terrestris, Felicia muricata, Atriplex vestita, Roepera retrofractum, Cynodon dactylon, Chrysocoma ciliata, Stipagostis namaquensis, Lycium pumilum, Lycium cinereum, Artemisia africana, Tripteris spinescens, Exomis microphylla and Derverra denudata. Although these areas are of ecological significance, from a plant species perspective they are considered low sensitivity as no plant SCC were observed in this habitat within the site.

Figure 5. The larger drainage features of the Loxton WEF 1 site are considered to represent the Southern Karoo Riviere vegetation type.

7. PROPOSED MITIGATION ACTIONS

The following avoidance and mitigation measures should be included in the EMPr for the Loxton Wind Energy Facility 1 in order to avoid, reduce and manage impacts on vegetation and plant species:

- Develop and implement alien vegetation, soil erosion, revegetation and rehabilitation management plans based on the site attributes and environmental constraints. This can be developed post-authorisation once the project is certain to go ahead.

- Ensure that all vegetation-related preconstruction permits have been obtained, and surveys and walk-throughs have been conducted prior to the commencement of construction activity.

- Preconstruction walk-through of the final development footprint to check the final footprint areas and access road routes to verify that sensitive habitats are being avoided as much as possible and also provide certainty as to the zero expected impact on plant SCC.

- Annual rehabilitation activities in line with the Generic EMPr requirements (for example, any erosion problems observed on-site should be rectified as soon as possible using appropriate revegetation and erosion control works).

The following Monitoring and management actions should be included in the EMPr:

- Ensure that all vegetation-related preconstruction permits, surveys and walk-throughs have been conducted prior to the commencement of construction activity.

- Monitoring of vegetation clearing during construction by the EO to ensure that any protected plant within the development footprint area are translocated to safety where necessary.

- Annual monitoring of erosion and runoff from the roads and hard stands into the adjacent veld to ensure that the hardened surfaces and roads are not generating a lot of runoff that is impacting adjacent natural areas. There should be follow-up erosion control and alien vegetation clearing where required.

7.1 Cumulative Impacts

Cumulative impacts associated with the Loxton Wind Energy Facility 1 are assessed in the Terrestrial Biodiversity Assessment and are not assessed in detail here. From a plant species and vegetation perspective, the Loxton Wind Energy Facility 1 would have very low impact on plant SCC and the Eastern Upper Karoo and Upper Karoo Hardeveld vegetation types have been little impacted by renewable energy development to date. As a result, the contribution of the Loxton Wind Energy Facility 1 towards cumulative impact on plant SCC and vegetation is considered acceptable.

8. COMPARATIVE ASSESSMENT OF ALTERNATIVES

There are no alternatives to be considered with regards to the PV facility.

8.1 No-Go Alternative

Under the no-go alternative, the current landuse 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 landuse 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, but has less impact than the loss of habitat resulting from the construction and operation of the wind energy facility, which is seen as an additional stressor on the environment and not an alternative landuse.

9. CONCLUSION

- This compliance statement is applicable to the Loxton Wind Energy Facility 1 development with specific reference to the layout as provided for the assessment.
- Although the vegetation of the site is mapped as exclusively Eastern Upper Karoo under the VegMap, there are also areas of Upper Karoo Hardeveld and Southern Karoo Riviere present. There are however no threatened vegetation types present within the site or nearby.
- No plant species of concern (SCC), were observed within the site despite extensive surveys across the site, confirming the low sensitivity of the project footprint.
- The low sensitivity of the site as identified by the DFFE Screening Tool for the Plant Species Theme was confirmed by the field assessment there are no significant vegetation features within the site.

9.1 Impact Statement

The footprint of the Loxton WEF 1 is restricted to low sensitivity areas with no observed plant species of conservation concern present. As such, from a plant species perspective there are no reasons to oppose the Loxton Wind Energy Facility 1.

10. ANNEX 1. LIST OF PLANT SPECIES

List of plant species recorded from the Loxton WEF 1 site, as observed during the field assessment.

Family	Genus	Species	Rank	Subspecies	IUCN Status[1]
Acanthaceae	*Barleria*	*stimulans*			LC
Acanthaceae	*Blepharis*	*mitrata*			LC
Acanthaceae	*Blepharis*	*capensis*			LC
Aizoaceae	*Delosperma*	sp.			
Aizoaceae	*Drosanthemum*	*lique*			LC
Aizoaceae	*Drosanthemum*	*hispidum*			LC
Aizoaceae	*Galenia*	*africana*			LC
Aizoaceae	*Galenia*	*secunda*			LC
Aizoaceae	*Galenia*	*sarcophylla*			LC
Aizoaceae	*Malephora*	*purpureo-crocea*			LC
Aizoaceae	*Mesembryanthemum*	*splendens*	subsp.	*pentagonum*	
Aizoaceae	*Mesembryanthemum*	*junceum*			
Aizoaceae	*Mesembryanthemum*	*noctiflorum*	subsp.	*stramineum*	
Aizoaceae	*Mesembryanthemum*	*stenandrum*			LC
Aizoaceae	*Mesembryanthemum*	*coriarium*			
Aizoaceae	*Mesembryanthemum*	*nodiflorum*			LC
Aizoaceae	*Mesembryanthemum*	*emarcidum*			
Aizoaceae	*Mesembryanthemum*	*crystallinum*			LC
Aizoaceae	*Plinthus*	*karooicus*			LC
Aizoaceae	*Ruschia*	*intricata*			LC
Aizoaceae	*Ruschia*	*spinosa*			LC
Aizoaceae	*Stomatium*	*villetii*			LC
Aizoaceae	*Tetragonia*	*spicata*			LC
Aizoaceae	*Tetragonia*	*fruticosa*			LC
Aizoaceae	*Trichodiadema*	*setuliferum*			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
Amaranthaceae	*Chenopodium*	*album*			
Amaranthaceae	*Salsola*	*kali*			
Amaranthaceae	*Salsola*	*calluna*			LC

[1] 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[1]
Amaranthaceae	*Salsola*	*aphylla*			LC
Amaranthaceae	*Sericocoma*	*avolans*			LC
Amaranthaceae	*Suaeda*	*fruticosa*			LC
Anacampserotaceae	*Anacampseros*	*ustulata*			LC
Anacampserotaceae	*Anacampseros*	*albidiflora*			LC
Anacardiaceae	*Searsia*	*undulata*			LC
Anacardiaceae	*Searsia*	*lancea*			LC
Anacardiaceae	*Searsia*	*burchellii*			LC
Apiaceae	*Apium*	*graveolens*			
Apiaceae	*Berula*	*thunbergii*			LC
Apiaceae	*Deverra*	*denudata*	subsp.	*aphylla*	LC
Apocynaceae	*Gomphocarpus*	*filiformis*			LC
Apocynaceae	*Gomphocarpus*	*fruticosus*	subsp.	*fruticosus*	LC
Apocynaceae	*Microloma*	*armatum*	var.	*armatum*	LC
Asparagaceae	*Asparagus*	*mucronatus*			LC
Asparagaceae	*Asparagus*	*exuvialis*	forma	*exuvialis*	NE
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*	*broomii*			
Asphodelaceae	*Bulbine*	*frutescens*			LC
Asphodelaceae	*Gonialoe*	*variegata*			LC
Asphodelaceae	*Kniphofia*	*uvaria*			LC
Aspleniaceae	*Asplenium*	*cordatum*			LC
Asteraceae	*Arctotis*	*leiocarpa*			LC
Asteraceae	*Berkheya*	*spinosa*			LC
Asteraceae	*Chrysocoma*	*obtusata*			LC
Asteraceae	*Chrysocoma*	*ciliata*			LC
Asteraceae	*Cineraria*	*lobata*	subsp.	*lobata*	LC
Asteraceae	*Conyza*	*scabrida*			
Asteraceae	*Cotula*	*microglossa*			LC
Asteraceae	*Cotula*	*coronopifolia*			LC
Asteraceae	*Crassothonna*	*capensis*			LC
Asteraceae	*Crassothonna*	*protecta*			LC
Asteraceae	*Cuspidia*	*cernua*	subsp.	*annua*	LC
Asteraceae	*Dicerothamnus*	*rhinocerotis*			
Asteraceae	*Dicoma*	*capensis*			LC
Asteraceae	*Dimorphotheca*	*cuneata*			LC
Asteraceae	*Eriocephalus*	*microphyllus*	var.	*microphyllus*	LC

Family	Genus	Species	Rank	Subspecies	IUCN Status[1]
Asteraceae	*Eriocephalus*	*microcephalus*			LC
Asteraceae	*Eriocephalus*	*ericoides*	subsp.	*ericoides*	LC
Asteraceae	*Eriocephalus*	*decussatus*			LC
Asteraceae	*Eriocephalus*	*spinescens*			LC
Asteraceae	*Euryops*	*nodosus*			LC
Asteraceae	*Euryops*	*lateriflorus*			LC
Asteraceae	*Euryops*	*anthemoides*	subsp.	*anthemoides*	LC
Asteraceae	*Felicia*	*muricata*	subsp.	*muricata*	LC
Asteraceae	*Felicia*	*filifolia*	subsp.	*filifolia*	LC
Asteraceae	*Felicia*	*hirsuta*			LC
Asteraceae	*Gazania*	*lichtensteinii*			LC
Asteraceae	*Gazania*	*krebsiana*			
Asteraceae	*Geigeria*	*filifolia*			LC
Asteraceae	*Gorteria*	*alienata*			
Asteraceae	*Helichrysum*	*rugulosum*			LC
Asteraceae	*Helichrysum*	*zeyheri*			LC
Asteraceae	*Helichrysum*	*pentzioides*			LC
Asteraceae	*Helichrysum*	*lucilioides*			LC
Asteraceae	*Ifloga*	*glomerata*			LC
Asteraceae	*Kleinia*	*longiflora*			LC
Asteraceae	*Lasiopogon*	*glomerulatus*			LC
Asteraceae	*Leysera*	*tenella*			LC
Asteraceae	*Oedera*	*oppositifolia*			
Asteraceae	*Osteospermum*	*scariosum*	var.	*scariosum*	NE
Asteraceae	*Osteospermum*	*spinescens*			LC
Asteraceae	*Osteospermum*	*sinuatum*			
Asteraceae	*Osteospermum*	*leptolobum*			LC
Asteraceae	*Pegolettia*	*retrofracta*			LC
Asteraceae	*Pentzia*	*globosa*			LC
Asteraceae	*Pentzia*	*quinquefida*			LC
Asteraceae	*Pentzia*	*lanata*			LC
Asteraceae	*Pentzia*	*punctata*			LC
Asteraceae	*Pentzia*	*incana*			LC
Asteraceae	*Phymaspermum*	*aciculare*			LC
Asteraceae	*Pteronia*	*adenocarpa*			LC
Asteraceae	*Pteronia*	*membranacea*			LC
Asteraceae	*Pteronia*	*glauca*			LC
Asteraceae	*Pteronia*	*viscosa*			LC
Asteraceae	*Pteronia*	*glomerata*			LC
Asteraceae	*Rhynchopsidium*	*sessiliflorum*			LC
Asteraceae	*Senecio*	*burchellii*			LC
Asteraceae	*Ursinia*	*nana*	subsp.	*nana*	LC

Family	Genus	Species	Rank	Subspecies	IUCN Status[1]
Asteraceae	*Vellereophyton*	*niveum*			LC
Bignoniaceae	*Rhigozum*	*obovatum*			LC
Boraginaceae	*Anchusa*	capensis			
Brassicaceae	*Heliophila*	*suavissima*			LC
Brassicaceae	*Heliophila*	*crithmifolia*			LC
Brassicaceae	*Lepidium*	*desertorum*			LC
Brassicaceae	*Sisymbrium*	*burchellii*	var.	*burchellii*	LC
Capparaceae	*Cadaba*	*aphylla*			LC
Caryophyllaceae	*Dianthus*	*namaensis*	var.	*dinteri*	LC
Caryophyllaceae	*Pollichia*	*campestris*			LC
Caryophyllaceae	*Silene*	*undulata*	subsp.	*undulata*	LC
Caryophyllaceae	*Spergularia*	*media*			
Colchicaceae	*Colchicum*	*melanthoides*			
Colchicaceae	*Colchicum*	*albomarginatum*			LC
Colchicaceae	*Ornithoglossum*	*undulatum*			LC
Convolvulaceae	*Convolvulus*	*sagittatus*			LC
Crassulaceae	*Adromischus*	*maculatus*			LC
Crassulaceae	*Cotyledon*	*orbiculata*	var.	*oblonga*	LC
Crassulaceae	*Crassula*	*corallina*	subsp.	*corallina*	LC
Crassulaceae	*Crassula*	*capitella*	subsp.	*thyrsiflora*	LC
Crassulaceae	*Crassula*	*subaphylla*	var.	*subaphylla*	LC
Crassulaceae	*Crassula*	*muscosa*	var.	*muscosa*	NE
Cucurbitaceae	*Cucumis*	*africanus*			LC
Cucurbitaceae	*Cucumis*	*myriocarpus*	subsp.	*leptodermis*	LC
Cyperaceae	*Cyperus*	*longus*	var.	*tenuiflorus*	NE
Cyperaceae	*Cyperus*	*marginatus*			LC
Cyperaceae	*Cyperus*	*usitatus*			LC
Cyperaceae	*Pseudoschoenus*	*inanis*			LC
Ebenaceae	*Diospyros*	*lycioides*	subsp.	*lycioides*	LC
Ebenaceae	*Diospyros*	*austro-africana*	var.	*austro-africana*	LC
Euphorbiaceae	*Euphorbia*	*stellispina*			LC
Euphorbiaceae	*Euphorbia*	*hypogaea*			LC
Euphorbiaceae	*Euphorbia*	*clavarioides*			LC
Euphorbiaceae	*Euphorbia*	*mauritanica*			LC
Fabaceae	*Indigofera*	*alternans*			
Fabaceae	*Lessertia*	*inflata*			LC
Fabaceae	*Lessertia*	*frutescens*	subsp.	*frutescens*	LC
Fabaceae	*Medicago*	*sativa*			NE
Fabaceae	*Melolobium*	*candicans*			LC
Fabaceae	*Prosopis*	*glandulosa*	var.	*glandulosa*	NE
Fabaceae	*Vachellia*	*karroo*			LC
Geraniaceae	*Erodium*	*cicutarium*			

Family	Genus	Species	Rank	Subspecies	IUCN Status[1]
Geraniaceae	*Monsonia*	*camdeboensis*			LC
Geraniaceae	*Pelargonium*	*aridum*			LC
Geraniaceae	*Pelargonium*	*abrotanifolium*			LC
Geraniaceae	*Pelargonium*	*minimum*			LC
Hyacinthaceae	*Albuca*	*suaveolens*			LC
Hyacinthaceae	*Daubenya*	*marginata*			LC
Hyacinthaceae	*Dipcadi*	*ciliare*			LC
Hyacinthaceae	*Dipcadi*	*viride*			LC
Hyacinthaceae	*Drimia*	*anomala*			LC
Hyacinthaceae	*Drimia*	*platyphylla*			LC
Hyacinthaceae	*Massonia*	*echinata*			LC
Hyacinthaceae	*Ornithogalum*	*juncifolium*			LC
Iridaceae	*Babiana*	*bainesii*			LC
Juncaceae	*Juncus*	*exsertus*			LC
Lamiaceae	*Ballota*	*africana*			LC
Lamiaceae	*Mentha*	*longifolia*	subsp.	*capensis*	LC
Lamiaceae	*Salvia*	*disermas*			LC
Lamiaceae	*Salvia*	*verbenaca*			LC
Lamiaceae	*Stachys*	*cuneata*			LC
Lamiaceae	*Stachys*	*rugosa*			LC
Lamiaceae	*Teucrium*	*trifidum*			LC
Limeaceae	*Limeum*	*aethiopicum*	var.	*aethiopicum*	NE
Lobeliaceae	*Lobelia*	*erinus*			LC
Lobeliaceae	*Lobelia*	*thermalis*			LC
Loranthaceae	*Septulina*	*glauca*			LC
Malvaceae	*Hermannia*	*filifolia*	var.	*filifolia*	NE
Malvaceae	*Hermannia*	*pulchella*			LC
Malvaceae	*Hermannia*	*coccocarpa*			LC
Malvaceae	*Hermannia*	*cuneifolia*	var.	*cuneifolia*	LC
Malvaceae	*Hermannia*	*desertorum*			LC
Malvaceae	*Hermannia*	*pulverata*			LC
Malvaceae	*Hibiscus*	*pusillus*			LC
Malvaceae	*Malva*	*parviflora*	var.	*parviflora*	
Malvaceae	*Radyera*	*urens*			LC
Melianthaceae	*Melianthus*	*comosus*			LC
Ophioglossaceae	*Ophioglossum*	*polyphyllum*	var.	*polyphyllum*	LC
Oxalidaceae	*Oxalis*	*heterophylla*			LC
Pedaliaceae	*Sesamum*	*capense*			LC
Plantaginaceae	*Veronica*	*anagallis-aquatica*			LC
Poaceae	*Aristida*	*diffusa*	subsp.	*diffusa*	LC
Poaceae	*Bromus*	*pectinatus*			LC
Poaceae	*Cenchrus*	*ciliaris*			LC

Family	Genus	Species	Rank	Subspecies	IUCN Status[1]
Poaceae	*Cynodon*	*dactylon*			LC
Poaceae	*Cynodon*	*incompletus*			LC
Poaceae	*Digitaria*	*argyrograpta*			LC
Poaceae	*Digitaria*	*eriantha*			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*	*obtusa*			LC
Poaceae	*Fingerhuthia*	*africana*			LC
Poaceae	*Heteropogon*	*contortus*			LC
Poaceae	*Leptochloa*	*fusca*			LC
Poaceae	*Melica*	*decumbens*			LC
Poaceae	*Oropetium*	*capense*			LC
Poaceae	*Phragmites*	*australis*			LC
Poaceae	*Polypogon*	*monspeliensis*			NE
Poaceae	*Sporobolus*	*ioclados*			LC
Poaceae	*Sporobolus*	*fimbriatus*			LC
Poaceae	*Stipagrostis*	*ciliata*	var.	*capensis*	LC
Poaceae	*Stipagrostis*	*obtusa*			LC
Poaceae	*Stipagrostis*	*namaquensis*			LC
Poaceae	*Tenaxia*	*disticha*			
Poaceae	*Themeda*	*triandra*			LC
Poaceae	*Tragus*	*koelerioides*			LC
Poaceae	*Tragus*	*racemosus*			LC
Poaceae	*Tragus*	*berteronianus*			LC
Polygalaceae	*Polygala*	*leptophylla*	var.	*leptophylla*	LC
Polygalaceae	*Polygala*	*ephedroides*			LC
Polygonaceae	*Polygonum*	*aviculare*			
Pteridaceae	*Pellaea*	*calomelanos*	var.	*calomelanos*	LC
Rubiaceae	*Nenax*	*microphylla*			LC
Santalaceae	*Lacomucinaea*	*lineata*			
Scrophulariaceae	*Aptosimum*	*procumbens*			LC
Scrophulariaceae	*Aptosimum*	*spinescens*			LC
Scrophulariaceae	*Aptosimum*	*indivisum*			LC
Scrophulariaceae	*Chaenostoma*	*halimifolium*			LC
Scrophulariaceae	*Diascia*	*capsularis*			LC
Scrophulariaceae	*Jamesbrittenia*	*tysonii*			LC
Scrophulariaceae	*Jamesbrittenia*	*atropurpurea*	subsp.	*atropurpurea*	LC
Scrophulariaceae	*Limosella*	*grandiflora*			LC
Scrophulariaceae	*Manulea*	*karrooica*			LC

Family	Genus	Species	Rank	Subspecies	IUCN Status[1]
Scrophulariaceae	*Nemesia*	*fruticans*			LC
Scrophulariaceae	*Peliostomum*	*leucorrhizum*			LC
Scrophulariaceae	*Selago*	*albida*			LC
Scrophulariaceae	*Selago*	*saxatilis*			LC
Scrophulariaceae	*Selago*	*acocksii*			LC
Scrophulariaceae	*Selago*	*geniculata*			LC
Solanaceae	*Lycium*	*oxycarpum*			LC
Solanaceae	*Lycium*	*cinereum*			LC
Solanaceae	*Lycium*	*horridum*			LC
Solanaceae	*Nicotiana*	*glauca*			
Solanaceae	*Solanum*	*nigrum*			
Solanaceae	*Solanum*	*tomentosum*			
Solanaceae	*Withania*	*somnifera*			LC
Thymelaeaceae	*Gnidia*	*meyeri*			LC
Urticaceae	*Forsskaolea*	*candida*			LC
Verbenaceae	*Chascanum*	*pumilum*			LC
Zygophyllaceae	*Roepera*	*lichtensteiniana*			
Zygophyllaceae	*Tetraena*	*chrysopteron*			
Zygophyllaceae	*Tribulus*	*terrestris*			LC