

SCOPING REPORT:

Specialist terrestrial fauna study on the potential impacts of the proposed Olifants River Wind Energy Facility, Northern Cape

Prepared by

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on behalf of
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SCOPING REPORT: 1st Draft



David Hoare Consulting cc
Biodiversity Assessments, Vegetation Description /
Mapping, Species Surveys

REGULATIONS GOVERNING THIS REPORT

This report has been prepared in terms the EIA Regulations promulgated under the *National Environmental Management Act* No. 107 of 1998 (NEMA) and is compliant with Regulation 543 Section 32 - Specialist reports and reports on specialised processes under the Act. Relevant clauses of the above regulation are quoted below.

Regulation 32. (1): An applicant or the EAP managing an application may appoint a person who is independent to carry out a specialist study or specialised process.

Regulation 32. (2): The person referred to in subregulation (1) must comply with the requirements of regulation 17.

Regulation 32. (3): A specialist report or a report on a specialised process prepared in terms of these Regulations must contain:

- (a) details of (i) the person who prepared the report, and
(ii) the expertise of that person to carry out the specialist study or specialized process;
- (b) a declaration that the person is independent in a form as may be specified by the competent authority;
- (c) an indication of the scope of, and the purpose for which, the report was prepared;
- (d) a description of the methodology adopted in preparing the report or carrying out the specialized process;
- (e) a description of any assumptions made and any uncertainties or gaps in knowledge;
- (f) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment;
- (g) recommendations in respect of any mitigation measures that should be considered by the applicant and the competent authority;
- (h) a description of any consultation process that was undertaken during the course of carrying out the study;
- (i) a summary and copies of any comments that were received during any consultation process;
- (j) any other information requested by the competent authority.

Section 17 relates to General requirements for EAPs or a person compiling a specialist report or undertaking a specialized process, as follows:

An EAP appointed in terms of regulation 16(1) must-

- (a) Be independent;
- (b) Have expertise in conducting environmental impact assessments, including knowledge of the Act, these regulations and any guidelines that have relevance to the proposed activity;
- (c) 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;
- (d) Comply with the Act, the Regulations and all other applicable legislation;
- (e) Take into account, to the extent possible, the matters referred to in regulation 8 when preparing the application and any report relating to the application; and
- (f) Disclose to the applicant and the competent authority all material information in the possession of the EAP that reasonably has or may have the potential of influencing-
 - i. Any decision to be taken with respect to the application by the competent authority in terms of these Regulations; or
 - ii. The objectivity of any report, plan or document to be prepared by the EAP in terms of these Regulations for submission to the competent authority.

Appointment of specialist

David Hoare of David Hoare Consulting cc was commissioned by Savannah Environmental (Pty) Ltd to provide specialist consulting services for the Environmental Impact Assessment for the proposed Olifants River Wind Energy Facility near Ebenhauzer on the West Coast in the Western Cape Province. The consulting services comprise an assessment of potential impacts on the fauna in the study area by the proposed project.

Details of specialist

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Summary of expertise

Dr David Hoare:

- Registered professional member of The South African Council for Natural Scientific Professions (Ecological Science, Botanical Science), registration number 400221/05.
- Founded David Hoare Consulting cc, an independent consultancy, in 2001.
- Ecological consultant since 1995.
- Conducted, or co-conducted, over 320 specialist ecological surveys as an ecological consultant.
- Published six technical scientific reports, 15 scientific conference presentations, seven book chapters and eight refereed scientific papers.
- Attended 15 national and international congresses & 5 expert workshops,
- Lectured vegetation science / ecology at 2 universities.
- Referee for 3 international journals.

Independence

David Hoare Consulting cc and its Directors have no connection with SARGE. David Hoare Consulting cc is not a subsidiary, legally or financially, of the proponent. Remuneration for services by the proponent in relation to this project is not linked to approval by decision-making authorities responsible for authorising this proposed project and the consultancy has no interest in secondary or downstream developments as a result of the authorisation of this project. David Hoare is an independent consultant to Savannah Environmental (Pty) Ltd and has no business, financial, personal or other interest in the activity, application or appeal in respect of which he was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of this specialist performing such work.

Scope and purpose of report

The scope and purpose of the report are reflected in the “Terms of reference” section of this report.

Conditions relating to this report

The findings, results, observations, conclusions and recommendations given in this report are based on the author’s best scientific and professional knowledge as well as available information. David Hoare Consulting cc and its staff reserve the right to modify aspects of the report including the recommendations if and when new information may become available from ongoing research or further work in this field, or pertaining to this investigation.

This report must not be altered or added to without the prior written consent of the author. This also refers to electronic copies of this report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

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INTRODUCTION

Terms of reference and approach

Savannah Environmental (Pty) Ltd. was appointed by SARGE to undertake an application for environmental authorisation through an Environmental Impact Assessment (EIA) for the proposed "Olifants River Wind Energy Facility". The project involves the establishment of a commercial wind energy facility and associated infrastructure, including a cluster of between 115 wind turbines. The purpose of the EIA is to identify environmental impacts associated with the project.

On 20 October 2011 David Hoare Consulting cc was appointed by Savannah Environmental (Pty) Ltd to undertake a terrestrial fauna assessment of the study area. The specific terms of reference for the scoping study include:

- to provide a description of the environment that may be affected by the activity and the manner in which the environment may be affected by the proposed project;
- to provide a description and evaluation of potential environmental issues and potential impacts (including direct, indirect and cumulative impacts) that have been identified;
- Direct, indirect and cumulative impacts of the identified issues must be evaluated within the Scoping Report in terms of the following criteria:
 - the **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected;
 - the **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international;
- a statement regarding the potential significance of the identified issues based on the evaluation of the issue/impacts;
- A statement regarding the desk-top evaluation of full site, with high-level identification of potential areas of sensitivity (for input into a sensitivity map)
- identification of potentially significant impacts to be assessed within the EIA phase;
- to provide recommendations regarding the methodology to be adopted in assessing potentially significant impacts in the EIA phase (sufficiently detailed to be included within the Plan of Study for EIA and must include a description of the proposed method of assessing the potential environmental impacts associated with the project).

This report provides details of the results of the Scoping phase. The findings of the study are based on a desktop assessment of the study area.

Study area

At a regional level the study area falls within the Northern Cape Province to the north-west of the town of Ebenhaezer, which is north-west of Vredendal. A more detailed description of the study area is provided in a section below.

METHODOLOGY

The assessment is to be undertaken in two phases, a Scoping phase and an Environmental Impact Assessment phase. The objective of the Scoping phase was to review fauna patterns within the study area to identify any sensitive areas to be avoided during development. It was therefore necessary to provide checklists of sensitive species that could potentially occur in the study area. For potential species, only those of high conservation concern are provided. It was also intended to provide a draft habitat map of the study area based on available maps and database information. The results of the Scoping phase study are provided in this report.

Assessment philosophy

Many parts of South Africa contain high levels of biodiversity at species and ecosystem level. At any single site there may be large numbers of species or high ecological complexity. Sites also vary in their natural character and uniqueness and the level to which they have been previously disturbed. Assessing the potential impacts of a proposed development often requires evaluating the conservation value of a site relative to other natural areas and relative to the national importance of the site in terms of biodiversity conservation. A simple approach to evaluating the relative importance of a site includes assessing the following:

- Is the site unique in terms of natural or biodiversity features?
- Is the protection of biodiversity features on the site of national/provincial importance?
- Would development of the site lead to contravention of any international, national or provincial legislation, policy, convention or regulation?

Thus, the general approach adopted for this type of study is to identify any critical biodiversity issues that may lead to the decision that the proposed project cannot take place, i.e. to specifically focus on red flags and/or potential fatal flaws. Biodiversity issues are assessed by documenting whether any important biodiversity features occur on site, including species, ecosystems or processes that maintain ecosystems and/or species.

It is not the intention to provide comprehensive lists of all species that occur on site, since most of the species on these lists are usually common or widespread species. Rare, threatened, protected and conservation-worthy species and habitats are considered to be the highest priority, the presence of which are most likely to result in significant negative impacts on the ecological environment. The focus on national and provincial priorities and critical biodiversity issues is in line with National legislation protecting environmental and biodiversity resources, including, but not limited to the following which ensure protection of ecological processes, natural systems and natural beauty as well as the preservation of biotic diversity in the natural environment:

1. Environment Conservation Act (Act 73 of 1989)
2. National Environmental Management Act, 1998 (NEMA) (Act 107 of 1998)
3. National Environmental Management Biodiversity Act, 2004. (Act 10 Of 2004)

Animal species of concern

The purpose of listing Red List animal species is to provide information on the potential occurrence of species of special concern in the study area that may be affected by the proposed infrastructure. Species appearing on these lists can then be assessed in terms of their habitat requirements in order to determine whether any of them have a likelihood of occurring in habitats that may be affected by the proposed infrastructure.

Lists were compiled specifically for any species of conservation concern previously recorded in the area and any other species with potential conservation value.

Provincial and National legislation was evaluated in order to provide lists of any animal species that have protected status. The most important legislation is the following: *National Environmental Management: Biodiversity Act (Act No 10 of 2004)* and .

Lists of threatened animal species that have a geographical range that includes the study area were obtained from literature sources (for example, Alexander & Marais 2007, Branch 1988, 2001, du Preez & Carruthers 2009, Friedmann & Daly 2004, Mills & Hes 1997). The likelihood of any of them occurring was evaluated on the basis of habitat preference and habitats available at each of the proposed sites. The three parameters used to assess the probability of occurrence for each species were as follows:

- *Habitat requirements*: most Red Data animals have very specific habitat requirements and the presence of these habitat characteristics within the study area were assessed;
- *Habitat status*: in the event that available habitat is considered suitable for these species, the status or ecological condition was assessed. Often, a high level of degradation of a specific habitat type will negate the potential presence of Red Data species (especially wetland-related habitats where water-quality plays a major role); and
- *Habitat linkage*: movement between areas used for breeding and feeding purposes forms an essential part of ecological existence of many species. The connectivity of the study area to these surrounding habitats and adequacy of these linkages are assessed for the ecological functioning Red Data species within the study area.

For all threatened or protected organisms that occur in the general geographical area of the site, a rating of the likelihood of it occurring on site is given as follows:

- LOW: no suitable habitats occur on site / habitats on site do not match habitat description for species;
- MEDIUM: habitats on site match general habitat description for species (e.g. fynbos), but detailed microhabitat requirements (e.g. mountain fynbos on shallow soils overlying Table Mountain sandstone) are absent on the site or are unknown from the descriptions given in the literature or from the authorities;
- HIGH: habitats found on site match very strongly the general and microhabitat description for the species (e.g. mountain fynbos on shallow soils overlying Table Mountain sandstone);
- DEFINITE: species found in habitats on site.

Limitations and exclusions

- Red List species are, by their nature, usually very rare and difficult to locate. Compiling the list of species that could potentially occur in an area is limited by the paucity of collection records that make it difficult to predict whether a species may occur in an area or not. The methodology used in this assessment is designed to reduce the risks of omitting any species, but it is always possible that a species that does not occur on a list may be unexpectedly located in an area.
- This scoping study was based on a desktop assessment only.
- This study excludes avifauna and bats, which are undertaken in separate specialist studies.

DESCRIPTION OF STUDY AREA

Location and site conditions

The study site is situated approximately 12 km west of the town of Lutzville within the Western Cape (Figure 1). The site falls within the quarter degree grid 3118CA. It is situated along the West Coast of South Africa within 4 km of the coastline. The proposed facility would occur on the following farm portions:

- RE of Zoutpans Klipheuwel 268,
- Portion 1 of Zoutpans Klipheuwel 268,
- Erf 618 of the Orange River Settlement.

A regional site identification process to determine and delineate areas suitable for wind energy development was undertaken and included the consideration of sites/areas of special environmental importance and planning criteria, as well as issues relating to landscape character, value, sensitivity and capacity. These aspects were then balanced with technical constraining factors affecting the siting of a wind farm, including the wind resource land availability, accessibility and existing grid infrastructure. The current site is sufficiently large to allow placement of the infrastructure in alternative positions within the site.

The study area is accessible from Cape Town via the N7, which runs from Cape Town past Klawer. From there the R362 and R363 run to Lutzville. The R362 runs from Lutzville past the south-eastern part of the site (Zoutpans Klipheuwel). Gravel access roads run from the R363 to the northern parts of the site (Erf 618 of the Orange River Settlement).

The study site is situated in an area with relatively gentle topography. The general slope in

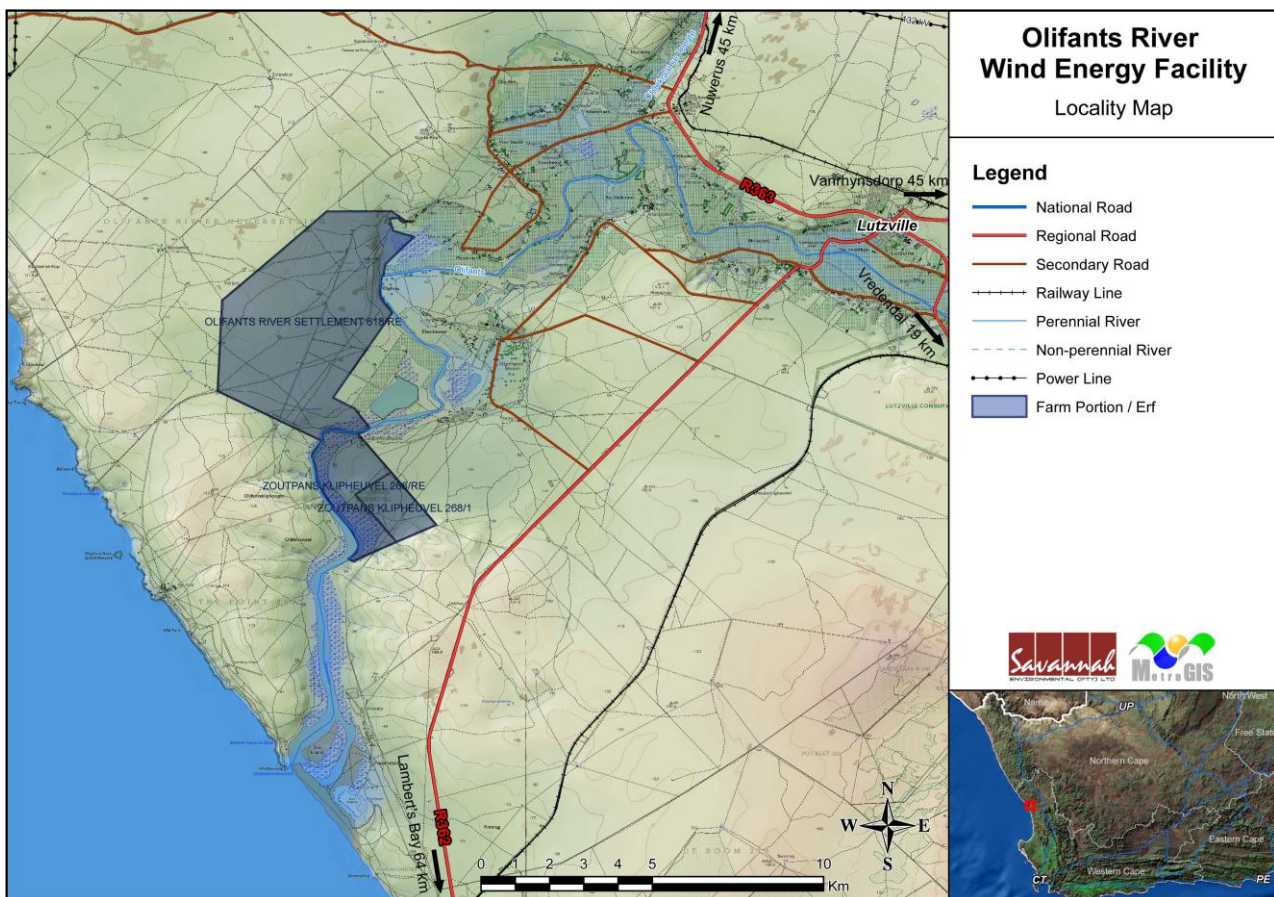


Figure 1: Location of the proposed wind energy facility

this area is from east to west down towards the coastline, but the site itself is influenced more by the proximity of the Olifants River towards which the landscape slopes. The Olifants River passes between the two parts of the site. The elevation on site varies from 5 to 90 m above sea level.

Detailed soil information is not available for broad areas of the country. As a surrogate, landtype data was used to provide a general description of soils in the study area (landtypes are areas with largely uniform soils, topography and climate). The landtypes described below provide a generalized description of soils on site that may differ in detail from site-specific patterns, but not in overall trends. There are two land types in the study area, the Ae and Ia landtypes (Land Type Survey Staff, 1987). The Ae covers most of the site and the Ia covers the areas occupied by the river.

The A-group of land types refer to yellow and red soils without water tables belonging to one or more of the following soil forms: Inanda, Kranskop, Magwa, Hutton, Griffin, Clovelly. These are red-yellow apedal, freely drained soils. The Ae landtype consists of red, high base status, > 300 mm deep soils and no dunes (MacVicar et al. 1974). The Ia unit refers to land types with a soil pattern difficult to accommodate elsewhere, at least 60% of which comprises pedologically youthful, deep (more than 1 000 mm to underlying rock) unconsolidated deposits.



Figure 2: Google image of the site.

Rainfall occurs from May to August. Mean annual rainfall is 100 mm to 120 mm per year. All areas with less than 400 mm rainfall are considered to be arid. The study area can therefore be considered to be very arid. Winter dew is common and moisture is also supplemented by fog rolling in from the sea.

The vegetation of the major part of the site is Namaqualand Strandveld, with the areas within the river classified as Arid Estuarine Salt Marshes. Namaqualand Strandveld is found on more stable substrates of quaternary stabilized Aeolian, deep red or yellowish-red stable dunes and deep sands. The vegetation is a well-developed coastal shrubland containing a high proportion of succulent shrub species. The Arid Estuarine Salt Marshes vegetation type is found in river mouths of the Namaqualand Rivers with patches of supratidal salt marshes on elevated terraces. The vegetation consists mainly of low succulent dwarf shrubland patches, forming a mosaic with creeping grassy mats and patches of reed beds.

A landcover map of the study area (Fairbanks *et al.* 2000) indicates that, with the exception of a small area of cultivation on the floodplain of the Olifants River just outside the north-eastern corner of the study area, the entire site is in a natural state and consist of "shrubland and low fynbos". The 1:50 000 topocadastral map of the site shows a number of small roads and tracks on site, otherwise no major infrastructure. A Google image of the site (Figure 2) confirms these patterns.

Red List animal species of the study area

All threatened (Critically Endangered, Endangered or Vulnerable) or near threatened vertebrate animals (mammals, reptiles, amphibians) that could occur in the study area are listed in Appendix 2. Those vertebrate species with a geographical distribution that includes the study area, and habitat preference that includes habitats available in the study area are discussed further. Birds are covered in a separate specialist study and are not reported on here.

There are two threatened terrestrial mammal species that have a geographical distribution that includes the site and habitat requirements which are met by those found on site. These are Grant's Golden Mole, listed nationally as Vulnerable, and the White-tailed Rat, listed nationally as Endangered.

Grant's Golden Mole is listed globally as Least Concern, but this includes another subspecies that is common in Namibia. The national listing is therefore considered valid for the subspecies that occurs only in South Africa. It is found in Strandveld Succulent Karoo in subterranean habitats in shifting sands. Due to the distribution of the species relative to the site and the fact that habitat conditions on site are suitable for the species, there is a high probability that it could occur on site.

The White-tailed Rat occurs in Highveld and montane grassland, but requires sandy to loam soils with good cover. It has been previously recorded in the grid in which the study area is located, which indicates that there is a high probability of it occurring in the study area. The study area contains sandy soils with natural vegetation. There is therefore a high probability of these areas being suitable for this species. The potential occurrence of the species on site is difficult to determine due to the sparse nature of existing populations of this species and it's wide distribution across South Africa.

There are three bat species of low conservation concern that could occur on site. These are the Natal Long-fingered Bat, the Cape Horseshoe Bat and Geoffroy's Horseshoe Bat. All three are listed nationally as Near Threatened (Friedmann & Daly 2004, Monadjem et al. 2010) and globally as Least Concern (www.iucn.org).

The Cape Horseshoe Bat is of potential concern in South Africa with regards to wind energy development due to the fact that the distribution of this species co-incides closely with the geographical areas where most wind energy facilities are proposed to be located (coastal and escarpment regions from Eastern Cape to Cape Town and northwards up the West Coast). The species is therefore vulnerable to cumulative impacts from multiple wind energy projects. The species is also endemic to South Africa and a small area of southern Namibia and is therefore primarily a South African concern. It is listed as Near Threatened in South Africa (Friedmann & Daly 2004, Monadjem et al. 2010) and Least Concern globally (www.iucn.org), which does not make sense considering it is practically endemic to South Africa. From a biodiversity point of view, it would be sensible to treat it as a Near Threatened species.

There are no amphibian species of conservation concern that have a geographical distribution that includes the study area.

There is one reptile species of conservation concern that has a distribution that includes the study area and which could occur on site, the Namaqua Plated Lizard (Near Threatened). This is a terrestrial species that is found in dry sandy areas and bare rocky hillsides in succulent karoo and renosterveld. It shelters in a short burrow dug at the base of a bush or in rodent burrows. It has the habit of wriggling into loose sand so that only the tip of the snout sticks out. It has been previously recorded in the quarter degree grid just to the south of the study area and there is a possibility it could occur on site.

In summary, the following threatened or near threatened animal species could potentially occur on site and may therefore be of concern for development of the site:

1. Grant's Golden Mole (VU),
2. White-tailed Rat (EN),
3. Natal Long-fingered Bat (NT),
4. Cape Horseshoe Bat (NT),
5. Geoffroy's Horseshoe Bat (NT),
6. Namaqua Plated Lizard (NT).

Protected animals

There are a number of animal species protected under the Western Cape Nature Conservation Laws Amendment Act of 2000 (Act 3 of 2000). These are listed in Appendix 3. According to the Western Cape Nature Conservation Laws Amendment Act, "*No person shall without a permit hunt or be in possession of any endangered wild animal or the carcass of any such animal*". The Act does not imply that habitat for these species should be regarded as sensitive and appears to be primarily concerned with protecting individual animals from hunting or trading. No permit requirements are contained in the Act for cases where such individuals may occur on land for which an application for development is being considered (as in the current case).

Those species protected according to the Western Cape Nature Conservation Laws Amendment Act of 2000 (Act 3 of 2000) that have a geographical distribution that includes the site and that may, therefore, occur on site are listed in Appendix 4, marked with the letter "P".

There are a number of animal species protected according to the National Environmental Management: Biodiversity Act (Act No. 10 of 2004). According to this Act, *"a person may not carry out a restricted activity involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7"*. Such activities include any that are *"of a nature that may negatively impact on the survival of a listed threatened or protected species"*. This implies that any negative impacts on habitats in which populations of protected species occur or are dependent upon would be restricted according to this Act.

Those species protected according to the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) that have a geographical distribution that includes the site and that may, therefore, occur on site are listed in Appendix 4, marked with the letter "N". This includes the following species: Black-footed Cat, Honey Badger, Leopard, Cape Fox and Armadillo Girdled Lizard.

All of these species are mobile animals that are likely to move away in the event of any activities on site disturbing them. They are therefore unlikely to be affected by the proposed development of the wind farm. The Armadillo Girdled Lizard is less mobile and could potentially be negatively affected by construction activities on site. According to habitat information, the Armadillo Girdled Lizard was considered to be unlikely to occur on site even though its geographical distribution includes the site. In summary, the following animal species protected by National legislation (National Environmental Management: Biodiversity Act) could potentially occur on site and may therefore be of concern for development of the study area:

1. None.

RELEVANT LEGISLATIVE AND PERMIT REQUIREMENTS

Relevant legislation is provided in this section to provide a description of the key legal considerations of importance to the proposed project. The applicable legislation is listed below.

Legislation

National Environmental Management Act, Act No. 107 of 1998 (NEMA)

NEMA requires, inter alia, that:

- "development must be socially, environmentally, and economically sustainable",
- "disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied." ,
- "a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions",

NEMA states that "the environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage."

Environment Conservation Act No 73 of 1989 Amendment Notice No R1183 of 1997

The ECA states that:

Development must be environmentally, socially and economically sustainable. Sustainable development requires the consideration of inter alia the following factors:

- that pollution and degradation of the environment is avoided, or, where they cannot be altogether avoided, are minimised and remedied;
- that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;
- that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised; and
- that negative impacts on the environment and on peoples' environmental rights be anticipated and prevented, and where they cannot be altogether prevented are minimised and remedied.

The developer is required to undertake Environmental Impact Assessments (EIA) for all projects listed as a Schedule 1 activity in the EIA regulations in order to control activities which might have a detrimental effect on the environment. Such activities will only be permitted with written authorisation from a competent authority.

National Environmental Management: Biodiversity Act (Act No 10 of 2004)

In terms of the Biodiversity Act, the developer has a responsibility for:

- The conservation of endangered ecosystems and restriction of activities according to the categorisation of the area (not just by listed activity as specified in the EIA regulations).
- Promote the application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all development within the area are in line with ecological sustainable development and protection of biodiversity.
- Limit further loss of biodiversity and conserve endangered ecosystems.

Chapter 4 of the Act relates to threatened or protected ecosystems or species. According to Section 57 of the Act, "Restricted activities involving listed threatened or protected species":

- (1) A person may not carry out a restricted activity involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7.

Such activities include any that are "of a nature that may negatively impact on the survival of a listed threatened or protected species".

Chapter 5 of the Act relates to species and organisms posing a potential threat to biodiversity. According to Section 75 of the Act, "Control and eradication of listed invasive species":

- (1) Control and eradication of a listed invasive species must be carried out by means of methods that are appropriate for the species concerned and the environment in which it occurs.
- (2) Any action taken to control and eradicate a listed invasive species must be executed with caution and in a manner that may cause the least possible harm to biodiversity and damage to the environment.
- (3) The methods employed to control and eradicate a listed invasive species must also be directed at the offspring, propagating material and re-growth of such invasive species in order to prevent such species from producing offspring, forming seed, regenerating or re-establishing itself in any manner.

GNR 151: Critically Endangered, Endangered, Vulnerable and Protected Species List

Published under Section 56(1) of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004).

GNR 1187: Amendment of Critically Endangered, Endangered, Vulnerable and Protected Species List

Published under Section 56(1) of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004).

Western Cape Nature Conservation Laws Amendment Act of 2000 (Act 3 of 2000)

In terms of Section 26 of this Act, "*No person shall without a permit hunt or be in possession of any endangered wild animal or the carcass of any such animal*". Schedule 2 of this Act provides a list of Protected Wild Animals.

National Veld and Forest Fire Act (Act No. 101 of 1998)

Provides requirements for veldfire prevention through firebreaks and required measures for fire-fighting. Chapter 4 of the Act places a duty on landowners to prepare and maintain firebreaks. Chapter 5 of the Act places a duty on all landowners to acquire equipment and have available personnel to fight fires.

Integrated Coastal Zone Management Act (Act No. 24 of 2008)

The purpose of the Act is to establish a system of integrated coastal and estuarine management in the Republic, including norms, standards and policies, in order to promote the conservation of the coastal environment, and maintain the natural attributes of coastal landscapes and seascapes, and to ensure that development and the use of natural resources within the coastal zone is socially and economically justifiable and economically sustainable; to define rights and duties in relation to coastal areas; to determine the responsibilities of organs of state in relation to coastal areas; to prohibit incineration at sea; to control dumping at sea, pollution in the coastal zone, inappropriate development of the coastal environment and other adverse effects on the coastal environment; to give effect to South Africa's international obligation in relation to coastal matters; and to provide for matters connected therewith. The Act provides for integrated management of the coastal zone and contains a number of Chapters dealing with various components. Those that may affect the current project are as follows:

- A coastal protection zone is defined in which development is restricted or controlled. A relatively arbitrary distance of 1000 m is defined in the act as

constituting this coastal protection zone, but sections of the act (sections 26 to 29) set out procedures whereby the various coastal areas may be specifically demarcated on a case-by-case basis.

- Assessing the environmental impact of activities which may detrimentally affect the coastal zone will be done in terms of the general environmental impact assessment regulations which were promulgated in terms of Chapter 5 of NEMA. Section 63 of Act 24 of 2008 provides the factors and criteria which the competent authority must consider when issuing environmental authorisations for activities affecting the coastal zone.

Sea Birds and Seals Protection Act (Act No. 46 of 1973)

Provides protection for certain species of marine birds, including the Damara Tern and the Bank Cormorant.

Other Acts

Other Acts that may apply to biodiversity issues, but which are considered to not apply to the current site are as follows:

- National Environmental Management Protected Areas Act (Act No. 57 of 2003)
- Marine Living Resources Act (Act No. 18 of 1998)
- Mountain Catchment Areas Act (Act No. 63 of 1970)
- Lake Areas Development Act (Act No. 39 of 1975)

IDENTIFICATION OF RISKS AND DESCRIPTION OF POTENTIAL IMPACTS

Potential issues relevant to potential impacts on the ecology of the study area include the following:

- Impacts on biodiversity: this includes any impacts on populations of individual species of concern, including protected species, on overall species richness and on habitats of species of concern. This includes impacts on genetic variability, population dynamics, overall species existence or health and on habitats important for species of concern.
- Secondary and cumulative impacts on ecology: this includes an assessment of the impacts of the proposed project taken in combination with the impacts of other known projects for the area or secondary impacts that may arise from changes in the social, economic or ecological environment.

A number of direct risks to ecosystems that would result from **construction** of the proposed wind energy facility are as follows:

- Excavation of foundations.
- Clearing of land for construction.
- Construction of access roads.
- Placement of power lines, cables and water pipelines (if applicable).
- Establishment of borrow and spoil areas.
- Chemical contamination of the soil by construction vehicles and machinery.
- Operation of construction camps.
- Storage of materials required for construction.

There are also risks associated with **operation** of the proposed facility, as follows:

- Maintenance of surrounding vegetation as part of management of the facility.

Description of potential impacts

Impact 1: Loss of habitat for threatened/protected terrestrial fauna

Nature: Construction of infrastructure will lead to direct loss of vegetation. This will lead to localised or more extensive reduction in the overall extent of habitat for species of concern. Consequences of the potential impact of loss of habitat occurring may include:

1. general loss of habitat for sensitive species;
2. disturbance to processes maintaining biodiversity and ecosystem goods and services.

The following animal species of conservation concern could potentially occur on site and may therefore be of concern for development of the study area:

1. Grant's Golden Mole (VU),
2. White-tailed Rat (EN),
3. Namaqua Plated Lizard (NT).

Duration: The impact will be long-term to permanent due to the fact that clearing of land for construction purposes cannot be reversed.

Extent: The impact will occur at the site of the proposed facility. It could potentially have an effect at a more regional level, since it could affect entire populations of affected species, but it is more likely to affect local populations, depending on the species.

Magnitude: The potential magnitude of this impact will be low to moderate, depending on the species concerned, the proportion of the landscape potentially affected and the specific locality of affected sites.

Probability: It is considered that there is a moderate probability of threatened or Near Threatened species occurring on site. The probability is therefore rated as "probable".

Potential significance: On the basis of this preliminary assessment, the impact is likely to be of medium significance, but depends on whether these species occur there or not.

Impact 2: Fragmentation of habitat for threatened/protected terrestrial fauna

Nature: Construction of infrastructure will lead to direct loss of vegetation, which may result in direct fragmentation of habitat for some species, especially those restricted to a band along the coast. This will lead to extensive reduction in the overall extent of habitat for species of concern. Consequences of the potential impact of loss of habitat occurring may include:

1. increased fragmentation of habitat and thus populations of species of concern (depending on location of impact);
2. disturbance to processes maintaining biodiversity.
3. reduction in area of occupancy of affected species; and
4. loss of genetic variation within affected species.

The following terrestrial animal species of conservation concern could potentially occur on site and may therefore be of concern for development of the study area:

1. Grant's Golden Mole (VU),
2. White-tailed Rat (EN),
3. Namaqua Plated Lizard (NT).

Duration: The impact will be long-term to permanent due to the fact that clearing of land for construction purposes cannot be reversed.

Extent: The impact will occur at the site of the proposed facility, but could potentially have an effect at a more regional level, due to the effect that fragmentation of habitat may have on affected species.

Magnitude: If fragmentation does occur, it can result in population processes continuing but in a modified way, which is scored as moderate.

Probability: Only Grant's Golden Mole is restricted to the coastal region. The other two species (White-tailed rat and Namaqua Plated Lizard) have a wider inland distribution and will not be affected by fragmentation of habitat due to development of the site. The site is slightly inland of the coast and there is similar habitat on the coastal and inland sides of the site through which species could potentially migrate. The most critical habitat for Grant's Golden Mole is on the coastal side and the site does not affect this. It is therefore considered highly improbable that development of the site will cause fragmentation of populations of any threatened and/or protected terrestrial animal species.

Potential significance: On the basis of this preliminary assessment, the impact is likely to be of (very) low significance.

Impact 3: Loss of individuals of threatened/protected terrestrial fauna

Nature: Threatened species include those classified as critically endangered, endangered or vulnerable. For any other species a loss of individuals or localised populations is unlikely to

lead to a change in the conservation status of the species. However, in the case of threatened animal species, loss of a population or individuals could lead to a direct change in the conservation status of the species. This may arise if the proposed infrastructure is located where it will impact on such individuals or populations or the habitat that they depend on. Consequences may include:

1. fragmentation of populations of affected species;
2. reduction in area of occupancy of affected species; and
3. loss of genetic variation within affected species.

These may all lead to a negative change in conservation status of the affected species, which implies a reduction in the chances of the species overall survival chances.

The following terrestrial animal species of conservation concern could potentially occur on site and may therefore be of concern for development of the study area:

1. Grant's Golden Mole (VU),
2. White-tailed Rat (EN),
3. Namaqua Plated Lizard (NT).

Duration: The impact will be short-term due to the fact that it is likely that only small numbers of individuals are likely to be affected and that losses of individuals may be replaced by recruitment within a small number of generations.

Extent: The impact will occur at the site of the proposed facility. It could potentially have an effect at a more regional level, since it could affect entire populations of affected species, but it is more likely to affect local populations, depending on the species.

Magnitude: The potential magnitude of this impact will be low (may cause a slight impact on population processes).

Probability: It is considered that there is a moderate probability of threatened or Near Threatened species occurring on site. The probability is therefore rated as "probable".

Potential significance: On the basis of this preliminary assessment, the impact is likely to be of low significance, but depends on whether these species occur there or not.

Impact 1: Collision of bats with turbine blades

Nature: Bats have been found to be particularly vulnerable to being killed by wind turbines. It has long been a mystery why they should be so badly affected since bat echo-location allows them to detect moving objects very well. A recent study in America has found that the primary cause for mortality is a combination of direct strikes and barotrauma (bats are killed when suddenly passing through a low air pressure region surrounding the turbine blade tips causing low pressure damage to the bat's lungs, Baerwald *et al.* 2008). The relative importance of this impact on bat populations depends on which species are likely to be affected, the importance of the site for those species and whether the site is within a migration corridor for particular bat species.

There are three bat species of potential conservation concern that could occur site or in the surrounding areas, Natal Long-fingered Bat, Cape Horseshoe Bat and Geoffroy's Horseshoe Bat. These species are listed globally as Least Concern (www.iucnredlist.org) and nationally as Near Threatened (Monadjem *et al.* 2010).

The Natal Long-fingered Bat occurs widely in the region, but more often in the southern and eastern parts than the arid west. It is predominantly a temperate to sub-tropical species with the core of its distribution in the savannas and grasslands of southern Africa. It is cave-dependent and congregates in huge numbers in suitable sites.

The Cape Horseshoe Bat roosts in caves and mine adits where it may form colonies of a thousand or more individuals. Its distribution is closely tied to the fynbos and succulent karoo biomes, it but forages predominantly in the canopy of trees.

Geoffroy's Horseshoe Bat occurs widely in southern African region, but less often in arid parts. It roosts in caves and subterranean habitats, such as mine adits, as well as rock hollows. These habitats do not occur on site.

Areas where caves are likely to be found in relation to the site are the rugged Hardeveld area between Koekenaap and Nuwerus to the north-east of the site (a minimum of 15 km from the site) and the mountains and hills around Klaver (closest are a minimum of 30 km to the south-east). It is possible that the site forms part of a migration route or foraging area for these three species, but it is unlikely that they roost anywhere on site. It is therefore unlikely that the site forms an important locality for the species, although they could be found on site and foraging individuals may be affected by the proposed wind energy facility.

These species will be affected by the operation of the WEF. These species may be negatively impacted by collisions with turbine blades. For all three species, the site may constitute a part of a corridor through which these species may migrate and, to a lesser extent, they may occur on site or nearby. The overall distribution of these species is, however, relatively wide. Loss of some individuals on site is therefore unlikely to have an effect on population numbers. Of greater concern is cumulative impacts from many wind energy facilities, most notably on the Cape Horseshoe Bat.

Extent: The impact will occur at the site of the proposed wind energy facility, but may affect populations in surrounding areas or affect migration routes of species and is therefore scored as "regional".

Magnitude: At a local scale, it is likely to be an impact of low magnitude (may cause a slight impact on population processes).

Duration: The impact will be of long-term duration (operation phase only).

Probability: It is considered that there is a moderate probability of Near Threatened species occurring on site. The probability is therefore rated as "probable".

Potential significance: On the basis of this preliminary assessment, the impact is likely to be of medium significance.

DISCUSSION AND CONCLUSIONS

There are six animal species of conservation concern that have a geographical distribution that includes the site and habitat preference that includes the type of habitat that could potentially occur on site. This includes the following species:

1. Grant's Golden Mole (VU),
2. White-tailed Rat (EN),
3. Natal Long-fingered Bat (NT),
4. Cape Horseshoe Bat (NT),
5. Geoffroy's Horseshoe Bat (NT),
6. Namaqua Plated Lizard (NT).

Most of the study area is in a natural state. There is therefore a real probability of encountering species of concern on site, if they suitable habitats occur there.

A risk assessment was undertaken which identified four potential negative impacts on threatened and/or protected terrestrial fauna and bat species. The potential impacts are as follows:

1. loss of habitat for potentially affected species due to construction,
2. fragmentation of habitat for potentially affected species due to construction,
3. loss of individuals of potentially affected species due to construction and/or the activities of personnel on site, and
4. mortality of bats due to collisions with turbines.

A preliminary assessment indicates that the issues of greatest concern are loss of habitat for terrestrial species of concern and collisions of bats with turbine blades. In both cases the preliminary assessment indicates that these are likely to be impacts of moderate significance.

Summary of proposed EIA methodology

The following assessments are required to be done during the EIA phase in order to properly assess potential impacts on terrestrial fauna by the proposed wind energy facility:

- The presence of species of concern must be evaluated. This must be done by assessing habitat suitability for those species that have been assessed as potentially occurring in the area. Particular attention must be paid to those species classified as threatened (VU, EN or CR), Near Threatened or Critically rare, including five mammal species (Grant's Golden Mole, White-tailed Rat, Natal Long-fingered Bat, Cape Horseshoe Bat and Geoffroy's Horseshoe Bat) and one reptile species (Namaqua Plated Lizard).
- If habitat is found to be suitable for any of these species then additional specialist studies will be required to detect the actual presence of these species on site, including a small mammal specialist study and a herpetofaunal specialist study.
- A bat specialist survey should be undertaken in the EIA phase. This survey should establish the presence of species on site and the potential presence of suitable roosting habitat, especially caves, in the surrounding areas (up to 10 km away). It is also essential to establish that the site is not within any bat migration routes, and if so during what time and season of the year migration does take place.

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APPENDICES:

Appendix 1: Vertebrate species of conservation concern with a geographical distribution that includes the study area.

MAMMALS (excluding bats)

Common name	Taxon	Habitat ¹	National status ¹	Global status ²	Likelihood of occurrence
Grant's Golden Mole	<i>Eremitalpa granti</i>	Strandveld Succulent Karoo, Namib Desert, in subterranean habitats in shifting sands. Species includes two subspecies – Grant's Golden Mole only occurs south of Orange River, Namib Golden Mole found in Namib Desert.	VU (excludes Namib Golden Mole subspecies)	LC (includes Namib Golden Mole subspecies)	HIGH , previously recorded in neighbouring grid, substrate properties on site considered to be suitable for this species.
White-tailed rat	<i>Mystromus albicaudatus</i>	Highveld and montane grassland, requires sandy soils with good cover. Found throughout South Africa except Northern Cape and Limpopo	EN	-	HIGH , previously recorded in grid, substrate properties on site considered to be suitable for this species
Cape Golden Mole	<i>Chrysochloris asiatica</i>	Subterranean habitats; arable land; urban areas; renosterveld; fynbos and strandveld succulent karoo; sandy soil	DD	LC	HIGH , previously recorded in neighbouring grid, substrate properties on site considered to be suitable for this species.
Honey badger	<i>Mellivora capensis</i>	Wide variety of habitats. Probably only in natural habitats.	NT	LC	MEDIUM , previously recorded in neighbouring grid
Lesueur's Wing-gland bat	<i>Cistugo lisueuri</i>	Occurs primarily in Lesotho and the Drakensberg as well as in the Cedarberg with only scattered records inbetween. It is associated with broken terrain with suitable rock crevices and water in the form of dams, rivers or marshes.	NT	LC	LOW , not previously recorded in grids, overall geographical distribution includes this area, but is marginal; no suitable roosting habitat likely to occur on site.
Natal long-fingered bat	<i>Miniopterus natalensis</i>	Occurs widely in the region, but more often in the southern and eastern parts than the arid west. It is predominantly a temperate to sub-tropical species with the core of its distribution in the savannas and grasslands of southern Africa. It is cave-dependent and congregates in huge numbers in suitable sites. Uses separate hibernacula and summer maternity roosts.	NT	LC	MEDIUM , overall geographical distribution includes this area; no suitable roosting habitat likely to occur on site

		Females migrate between these caves, which may be up to 150 km apart.			
Cape horseshoe bat	<i>Rhinolophus capensis</i>	Endemic to the south-western part of southern Africa, occurring from the Eastern Cape to Cape Town and then north to just south of the Namibian border. Roosts in caves and mine adits where it may form colonies of a thousand or more individuals. Closely tied to the fynbos and succulent karoo biomes, but forages predominantly in the canopy of trees.	NT	LC	MEDIUM overall geographical distribution includes this area; no suitable roosting habitat likely to occur on site
Geoffroy's horseshoe bat	<i>Rhinolophus clivosus</i>	Occurs widely in southern African region, but less often in arid interior parts. Roosts in caves and subterranean habitats, such as mine adits, as well as rock hollows. May form large colonies of up to several thousand individuals. Associated with a variety of habitats including arid savannah, woodland and riparian forest.	NT	LC	MEDIUM , previously recorded in neighbouring grid; no suitable roosting habitat likely to occur on site.

¹Distribution and national status according to Friedmann & Daly 2004.

²Global status according to IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3. (www.iucnredlist.org). Downloaded on 7 November 2011.

AMPHIBIANS

Common name	Species	Habitat	Status	Likelihood of occurrence
None				

¹Status according to Minter et al. 2004.

REPTILES

Common name	Species	Habitat	Status ³	Likelihood of occurrence
Armadillo girdled lizard	<i>Cordylus cataphractus</i>	Rock cracks and crevices. Diet consists mainly of termites, beetles and grasshoppers	VU	LOW , no suitable habitat likely to occur on site.
McLachlin's girdled lizard	<i>Cordylus mclachlani</i>	Restricted to rocky outcrops, occupying cracks in sandstone outcrops.	VU	LOW , just outside known distribution range. No rocky habitat on site.
Namaqua plated lizard	<i>Gerrhosaurus typicus</i>	Dry sandy areas and bare rocky hillsides	NT	HIGH , geographical distribution range includes site. Habitat on site probably suitable.
Namaqua day gecko	<i>Phelsuma ocellata</i>	Boulder strewn hillsides and rocky outcrops, but may also be found in trees and bushes	NT	LOW , no suitable habitat likely to occur on site.

Southern speckled padloper	<i>Homopus signatus cafer</i>	Rocky outcrops and ridges in regions of relatively low rainfall. Occurs west of Cedarberg to the coast, which is to the south of the site.	NT	LOW , just outside known distribution range. No rocky habitat on site
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³Distribution according to Marais 2004.

⁴Status according to IUCN 2010. IUCN Red List of Threatened Species. Version 2010.3. (www.iucnredlist.org). Downloaded on 7 November 2011.

Appendix 2: Animal species with a geographical distribution that includes the study area.

Notes:

1. Species of conservation concern are in red lettering.
2. Species protected according to the Northern Cape Nature Conservation Act of 2009 (Act 9 of 2009) marked with "P"
3. Species protected according to the National Environmental Management: Biodiversity Act of 2004 (Act 10 of 2000) marked with "N"

Mammals:

^PSpringbok
^PKlipspringer
^PSteenbok
Cape grysbok
Common duiker
Rock hyrax
Water mongoose
Black-backed jackal
Caracal
Yellow mongoose
^{N^P}Black-footed cat
African wild cat
Small grey mongoose
Small-spotted genet
Large grey mongoose
Striped polecat
^NHoney badger
Bat-eared fox
^{N^P}Leopard
African weasel
^PAardwolf
Suricate
^NCape fox
^PLeseur's wing-gland bat
^PLong-tailed serotine bat
^PNatal long-fingered bat
^PCape serotine bat
^PEgyptian slit-faced bat
^PCape horseshoe bat
^PGeoffroy's horseshoe bat
^PEgyptian free-tailed bat
Cape golden mole
^PReddish-grey musk shrew
Grant's golden mole
^PLesser dwarf shrew
Cape hare
Scrub hare
Chacma baboon
Namaqua rock mouse
Cape dune mole-rat
Common mole-rat
Grey climbing mouse
Short-tailed gerbil
Cape mole-rat
Hairy-footed gerbil

Spectacled dormouse
Porcupine
Large-eared mouse
Pygmy mouse
Verreaux's mouse
White-tailed rat
Vlei rat
Saunders' vlei rat
Karoo bush rat
Striped mouse
Cape gerbil
^PCape rock elephant-shrew
Aardvark

Reptiles:

^PWestern dwarf chameleon
^PNamaqua chameleon
Puff adder
Many-horned adder
Cape cobra
Black spitting cobra
Rinkhals
Coral snake / coral shield cobra
Boomslang
Dwarf beaked snake
Karoo whip snake
Namib sand snake
Beetz's tiger snake
Brown house snake
Spotted rock snake
Mole snake
^PSundevall's shovel-snout
Common egg-eater
Delalande's beaked blind snake
Schinz's beaked blind snake
^PSouthern rock agama
^PSouthern spiny agama
Knox's desert lizard
Western sandveld lizard
Cape legless skink
Coastal dwarf legless skink
Southern blind legless skink
Cape dwarf burrowing skink
Striped dwarf burrowing skink
Cape skink
Variegated skink

Western rock skink

^{NP} Armadillo girdled lizard

^P McLachlan's girdled lizard

^P Karoo girdled lizard

^P Large-scaled girdled lizard

^P Graceful crag lizard

^P Namaqua plated lizard

^P Dwarf plated lizard

^P Striped dwarf leaf-toed gecko

^P Giant ground gecko

^P Bibron's tubercled gecko

^P Austen's dune gecko

^P Rough gecko

^P Western Cape gecko

^P Weber's gecko

^P Marico gecko

^P Namaqua day gecko

^P Speckled padloper

^P Angulate tortoise

^P Karoo tent tortoise

Amphibians

^P Namaqua rain frog

^P Raucous toad

^P Karoo toad

^P Common platanna

^P Namaqua caco

^P Cape river frog

^P Clicking stream frog

^P Cape sand frog

Fish

Estuarine round herring

Chubbyhead barb

Sharptooth catfish

Cape galaxias (NT)

Largemouth bass

Smallmouth bass

Spotted bass

Banded tilapia

Mozambique tilapia

Cape kurper

Cape silverside

Flathead mullet

Appendix 3: Vertebrate animal species (excluding birds) protected under the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)
(as updated in R. 1187, 14 December 2007)

CRITICALLY ENDANGERED SPECIES

Reptilia

Loggerhead sea turtle
Leatherback sea turtle
Hawksbill sea turtle

Mammalia

Riverine rabbit
Rough-haired golden mole

ENDANGERED SPECIES

Reptilia

Green turtle
Giant girdled lizard
Olive ridley turtle
Geometric tortoise

Mammalia

Robust golden mole
Tsessebe
Black rhinoceros
Mountain zebra
African wild dog
Gunning's golden mole
Oribi
Red squirrel
Four-toed elephant-shrew

VULNERABLE SPECIES

Mammalia

Cheetah
Samango monkey
Giant golden mole
Giant rat
Bontebok
Tree hyrax
Roan antelope
Pangolin
Juliana's golden mole
Suni
Large-eared free-tailed bat
Lion
Leopard
Blue duiker

PROTECTED SPECIES

Amphibia

Giant bullfrog
African bullfrog

Reptilia

Gaboon adder
Namaqua dwarf adder
Smith's dwarf chameleon
Armadillo girdled lizard
Nile crocodile
African rock python

Mammalia

Cape clawless otter
South African hedgehog
White rhinoceros
Black wildebeest
Spotted hyaena
Black-footed cat
Brown hyaena
Serval
African elephant
Spotted-necked otter
Honey badger
Sharpe's grysbok
Reedbuck
Cape fox