

---

# FAUNAL RELOCATION PLAN FOR THE 132KV OVERHEAD POWERLINE BETWEEN EXISTING BON ESPIRANGE AND KOMSBERG SUBSTATIONS IN THE WESTERN AND NORTHERN CAPE PROVINCES

---

Prepared for:

**Kuduskop Wind Farm (Pty) Ltd**

Prepared by:



30 Chudleigh Road  
Plumstead, 7800  
Cape Town, Western Cape



**May 2025**

## Details of Company

---

Name	Biodiversity Africa
Email	<a href="mailto:Tarryn@biodiversityafrica.com">Tarryn@biodiversityafrica.com</a>
Tel	071 332 3994 or 078 340 6295
Address	30 Chudleigh Road Plumstead, 7800 Cape Town

## Contributors

---

### **Tarryn Martin (Botanical Specialist) (*Pri. Sci. Nat.* 008745)**

*Role: Author*

Tarryn has over thirteen years of experience working as a botanist, twelve of which are in the environmental sector. She has worked as a botanical specialist and project manager on projects within South Africa, Mozambique, Lesotho, Zambia, Tanzania, Cameroon and Malawi.

She has extensive experience writing botanical impact assessments, critical habitat assessments, biodiversity management plans, biodiversity monitoring plans and rehabilitation and restoration plans to South African and International Standards such as those of the International Finance Corporation (IFC). Her experience includes working on large renewable energy projects in South Africa as well as large mining projects in Mozambique, including multiple graphite mines and a heavy mineral mine, all of which were to international lenders standards.

Tarryn holds a BSc (Botany and Zoology), a BSc (Hons) in African Vertebrate Biodiversity and an MSc with distinction in Botany from Rhodes University. Tarryn's Master's thesis examined the impact of fire on the recovery of C3 and C4 Panicoid and non-Panicoid grasses within the context of climate change for which she won the Junior Captain Scott-Medal (Plant Science) for producing the top MSc of 2010 from the South African Academy of Science and Art as well as an Award for Outstanding Academic Achievement in Range and Forage Science from the Grassland Society of Southern Africa. Tarryn is a professional member of the South African Council for Natural Scientific Professionals (since 2014).

### **Amber Jackson (Faunal Specialist and Author) (*Cand. Nat. Sci*)**

*Role: Author*

Amber has over ten years' experience in environmental consulting and has managed projects across various sectors including mining, agriculture, forestry, renewable energy, housing, coastal and wetland recreational infrastructure. Most of these projects required lender finance and therefore met both in-country, lender and sector specific requirements.

Amber completed the IFC lead and Swiss funded programme in Environmental and Social Risk Management course in 2018. The purpose of the course was to upskill Sub-Saharan African

environmental consultants to increase the uptake of E&S standards by Financial Institutions.

Amber specialises in terrestrial vertebrate faunal assessments. She has conducted large scale faunal impact assessments that are to international lender's standards in Mozambique, Tanzania, Lesotho and Malawi. In South Africa her faunal impact assessments comply with the protocols for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity and follows the SANBI Species Environmental Assessment Guideline. Her specialist input goes beyond impact assessments and includes faunal opportunities and constraints assessments, Critical Habitat Assessments, Biodiversity related Management Plans and Biodiversity Monitoring Programmes.

Amber holds a BSc (Zoology and Ecology, Environment & Conservation) and BSc (Hons) in Ecology, Environment & Conservation from WITS University and an MPhil in Environmental Management from University of Cape Town. Amber's honours focused on the landscape effects on Herpetofauna in Kruger National Park and her Master's thesis focused on the management of social and natural aspects of environmental systems with a dissertation in food security that investigated the complex food system of informal and formal distribution markets.

## Table of Contents

<b>1. Introduction .....</b>	<b>8</b>
1.1. Project Background and Purpose of this Report .....	8
1.2. Faunal Relocation Principles.....	8
1.3. Purpose of this Report.....	8
<b>2. Legal Requirements .....</b>	<b>11</b>
2.1. National Legislation .....	11
2.2. Provincial Legislation .....	11
2.3. Conditions of Environmental Authorisation (EA) .....	11
<b>3. Fauna and faunal habitat of the project Area .....</b>	<b>12</b>
3.1. Species of Conservation Concern .....	12
<b>4. management actions .....</b>	<b>13</b>
4.1. Preventative Measures.....	13
4.2. Walk Down Prior to Construction.....	13
4.3. Pre-clearing Faunal Survey .....	14
4.4. Construction Site Checks and Action per Faunal Group.....	14
4.4.1. Snakes.....	14
4.4.2. Small Reptiles .....	15
4.4.3. Large Reptiles .....	15
4.4.4. Amphibians.....	16
4.4.5. Small Mammals .....	16
4.4.6. Large Mammals .....	17
4.5. Fauna Injuries and Mortalities.....	17
<b>5. Monitoring Plan .....</b>	<b>19</b>
5.1. MONITORING REQUIREMENTS.....	19
5.2. STORAGE OF DATA .....	20
5.3. REPORTING .....	20
<b>6. Roles and Responsibilities .....</b>	<b>21</b>
<b>7. References .....</b>	<b>22</b>
Appendix 1: Proof of SACNASP registration and highest qualification.....	23
Appendix 2: CV .....	27

## List of Figures

Figure 1.1: Map illustrating the location of the project area in relation to Matjiesfontein, Laingsburg and the R34. ....	9
Figure 1.2: Infrastructure map of the proposed OHPL. ....	10

## List of Tables

---

Table 3.1: Summary of threatened and near-threatened mammal species with a distribution that includes the project area .....	12
Table 5.1: Monitoring Actions, indicators, and timeframes for the implementation of the Plant Rescue and Protection Plan .....	19
Table 6.1: Roles and responsibilities associated with implementing the Fauna Relocation Plan. ....	21

## Glossary of Terms

---

**Biodiversity** is the term that is used to describe the variety of life on Earth and is defined as “*the variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems*” (Secretariat of the Convention on Biological Diversity, 2005).

**Development footprint** refers to the actual area/land in which infrastructure will be located.

**Fauna** for the purpose of this report refers to mammal, reptile and amphibian species only.

**Natural Habitat** refers to habitats composed of viable assemblages of plant and/or animal species of largely native origin and/or where human activity has not essentially modified an area’s primary ecological function and species composition.

**Project Area** refers to the erf or farm portion on which the development is proposed and that will be directly impacted by project infrastructure such as the roads, houses, etc.

**Species of Conservation Concern (SCC)** are all species that are assessed according the IUCN Red List Criteria as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Data Deficient (DD) or Near Threatened (NT), as well as range-restricted species which are not declining and are nationally listed as Rare or Extremely Rare [also referred to in some Red Lists as Critically Rare]. For the purpose of this report, protected species are also considered SCC.

## Abbreviations

---

<b>DFFE</b>	Department of Forestry, Fisheries and the Environment
<b>EA</b>	Environmental Authorisation
<b>ECO</b>	Environmental Control Officer
<b>EMPr</b>	Environmental Management Programme
<b>ha</b>	Hectare
<b>kV</b>	Kilo Volt
<b>MTS</b>	Main Transmission Station
<b>MW</b>	Mega Watt
<b>NEM:BA</b>	National Environmental Management Biodiversity Act
<b>ONA</b>	Other Natural Area
<b>PAOI</b>	Project Area of Influence
<b>PNCO</b>	Provincial Nature Conservation Ordinance
<b>SANBI</b>	South African National Biodiversity Institute
<b>TOPS</b>	Threatened or Protected Species
<b>WEF</b>	Wind Energy Facility

# 1. INTRODUCTION

---

## 1.1. PROJECT BACKGROUND AND PURPOSE OF THIS REPORT

In order for Kuduskop Wind Farm Pty Ltd to evacuate power from the authorised Kuduskop North and Kuduskop Wind Energy Facilities (WEFs), a 132kV Overhead Powerline (OHL) is proposed to be constructed between the existing Bon Espirange and Komsberg substations, as well as additions to the transmission infrastructure within the Komsberg substation property (Figure 1.1 and 1.2).

The proposed project infrastructure is situated within the Witzenberg Local Municipality in the Cape Winelands District Municipality, Western Cape, and the Karoo Hoogland Local Municipality in the Namakwa District Municipality, Northern Cape, South Africa (Figure 1.1).

The purpose of this Faunal Relocation Plan is to provide a practical methodology for the relocation of faunal species (mammals, reptiles and amphibians) encountered during the construction of the proposed Bon Espirange OHPL. The aim of this plan is to reduce faunal mortalities associated with the development.

## 1.2. FAUNAL RELOCATION PRINCIPLES

*In situ* relocation entails the preservation of a species/subpopulation in its original natural habitat where it has been found, whilst *ex situ* relocation entails the removal/relocation of a species/subpopulation from its original natural habitat to an alternative/artificial environment. *In situ* relocation is far more preferable in comparison to *ex situ* relocation, as *ex situ* relocation often results in the loss of genetic diversity and evolutionary adaption traits, which subsequently increases a species' risk of extinction.

*Ex situ* relocations also have significant impacts on the receiving environment. Translocated individuals/subpopulations could:

- Increase competition and thus the survival of 'native' species/subpopulations.
- Alter ecosystem dynamics and habitat structure.
- Result in genetic pollution through hybridization.
- Introduce pathogens and/or parasites into the receiving environment.
- Impact on the habitat itself.

## 1.3. PURPOSE OF THIS REPORT

The purpose of this plan is to minimise disturbance to fauna, provide a management plan for when species need to be relocated and to limit the number of faunal mortalities in the project area.



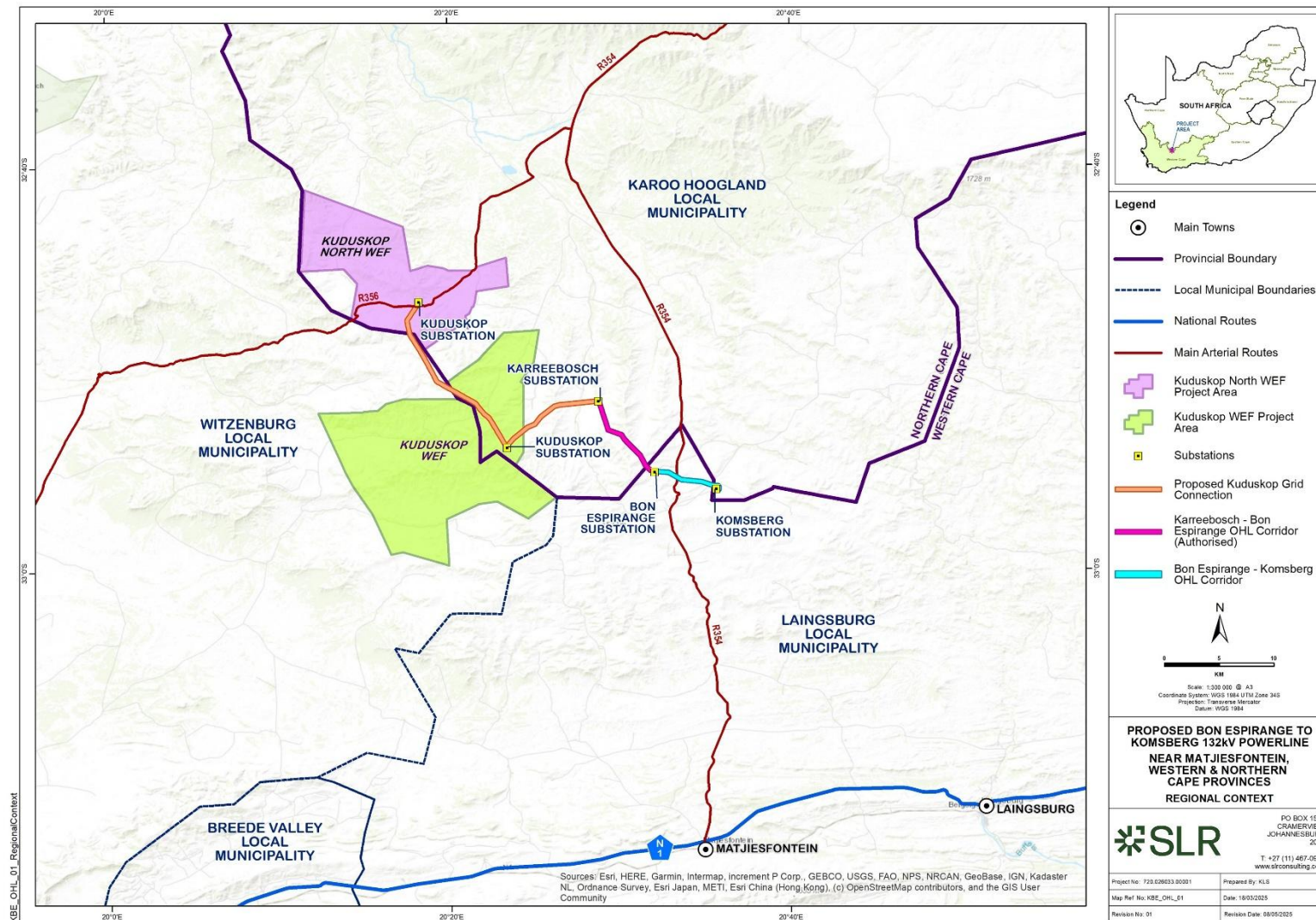


Figure 1.1: Map illustrating the location of the project area in relation to Matjiesfontein, Laingsburg and the R34.

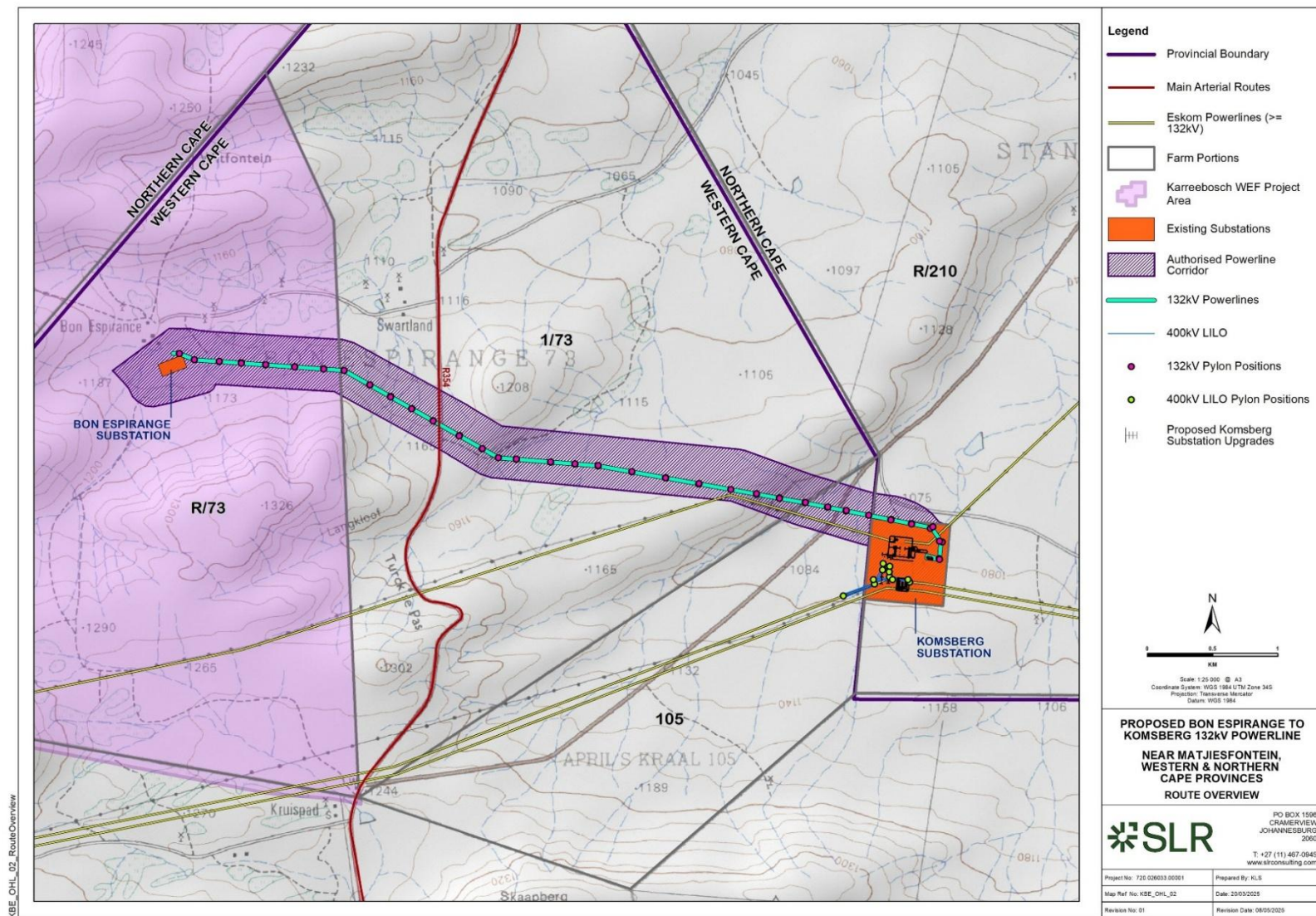


Figure 1.2: Infrastructure map of the proposed OHPL.

## 2. LEGAL REQUIREMENTS

---

### 2.1. NATIONAL LEGISLATION

Species listed in terms of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) **List of Threatened or Protected Species** (TOPS) (GN R. 151 of 2005 and the subsequent 2015 and 2023 amendments) are nationally protected and require permits for their removal and/or relocation from the Minister of the Department of Forestry, Fisheries and the Environment (DFFE). The Minister is the issuing authority for a permit and registration in relation to the carrying out of restricted activities involving any TOPS listed species. This legislation is applicable to this project for protected Amphibians, Reptiles and Mammals that may occur within the development footprint.

The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) **Norms and Standards for the Translocation of Indigenous Species in South Africa** provide guidelines for the relocation of indigenous mammals in South Africa and to minimise and mitigate the risks associated with the relocation of indigenous species. These norms and standards apply to species listed as threatened or protected in terms of section 56(1) of the Biodiversity Act as well as any mammal species listed as protected on the Mpumalanga Nature Conservation Act (Act No. 10 of 1998).

### 2.2. PROVINCIAL LEGISLATION

Every province in South Africa has a Provincial Nature Conservation Ordinance (PNCO) which provides a list of protected species for that province and specifies restricted activities involving these protected species. The Bon Espirange OHPL is located within the Western Cape province. As such, the Western Cape Nature Conservation Laws Amendment Act (Act No. 3 of 2000) applies. Any species protected in terms of the act, require permits for their removal and/or translocation from the Cape Nature.

In instances where a species is protected in terms of both national and provincial legislation, the national legislation supersedes provincial legislation, and permits must be obtained from the DFFE Minister.

### 2.3. CONDITIONS OF ENVIRONMENTAL AUTHORISATION (EA)

An Environmental Authorisation (EA) is a legal binding document which is subject to compliance with certain conditions. The holder of an EA is responsible for ensuring compliance with the conditions contained within an EA. This includes any person acting on the holders behalf, including but not limited to, an agent, contractor, sub-contractor, employee, consultant or person rendering a service to the holder of the EA. Non-compliance with a condition of the EA is considered unlawful and may result in criminal prosecution or other actions provided for in the National Environmental Management Act (Act No. 107 of 1998 as amended) and the Environmental Impact Assessment Regulations (2014 and subsequent amendments).



### 3. FAUNA AND FAUNAL HABITAT OF THE PROJECT AREA

Habitats are defined in this study as the natural environment or place where faunal species *live, breed and/or forage*. Each habitat type has different environmental conditions and structure which influences a species' distribution range.

Faunal habitat types were identified in the project area, including:

- Scrub habitat associated with scarps, crests and slopes;
- Rocky outcrops;
- Wash and Riparian habitat; and
- Seasonal inundated depressions (temporary wet areas), Reservoirs and farm dams.

Amphibian, reptile and mammal species will utilise these habitats either permanently or occasionally depending on the live stage and livelihood strategy.

#### 3.1. SPECIES OF CONSERVATION CONCERN

**Amphibians:** No amphibian species of conservation concern have a distribution range which includes the project area.

**Reptiles:** Three SCC are of relevance, two are listed as Endangered (EN) and one is listed as Near Threatened (NT), namely, Karoo Padlooper (*Chersobius boulengeri*) (EN), Tent Tortoise (*Psammobates tentorius*) (NT) and Armadillo Girdled Lizard (*Ouroborus cataphractus*) (NT). Suitable habitat is present in the project area and the likelihood of occurrence is considered High.

The Karoo Padloper and Armadillo Girdled Lizard require specific, niche habitats such as rock crevices, that are likely to be avoided by project infrastructure due to their sensitive nature.

**Mammals:** Eight SCC have a distribution range that intersects the project area, including one CR, three VU and four NT species. Of these species, three have a high likelihood of occurrence, one has a medium likelihood of occurrence and four have a low likelihood of occurrence. Table 3.1 below lists species with a high likelihood of occurrence in the project area.

**Table 3.1: Summary of threatened and near-threatened mammal species with a distribution that includes the project area**

Common name	Species name	Threat status	Likelihood of Occurrence within the project area	Relevant Project Area Habitat
Grey Rhebok	<i>Pelea capreolus</i>	NT	HIGH	All available habitats
Leopard	<i>Panthera pardus</i>	VU	HIGH	All available habitats
Spectacled Dormouse	<i>Graphiurus ocularis</i>	NT	HIGH	Rocky outcrops, scarps, crests and slopes

## 4. MANAGEMENT ACTIONS

---

The management actions for safeguarding faunal species that may occupy the project area and development footprint include the following:

- Preventative Measures to reduce the need for faunal relocations.
- Demarcation of faunal habitat no-go areas prior to construction.
- Temporary demarcation and exclusion of faunal habitats pre-clearing vegetation.
- Construction phase ECO/ESO site checks for fauna trapped or in harm's way or faunal mortalities within development footprint and appropriate method of relocation or disposal.

### 4.1. PREVENTATIVE MEASURES

Responsible Person: Contractor

Preventative measures to reduce the need for unnecessary faunal relocations must be implemented to reduce faunal injury and/or mortality and human/wildlife interactions. Measures that must be implemented include:

- All no-go areas must be clearly marked and warning signs prohibiting access erected.
- Clearing of indigenous vegetation must be done sequentially to minimise impacts to indigenous fauna species during clearing process. This includes clearing towards adjacent habitats to encourage movement of species to these areas.
- Fencing on site must allow small faunal species to move through the broader construction area without becoming trapped. However, exclusion fencing must be placed around infrastructure that presents a high risk to faunal species.
- Open areas such as trenches, canals, open pits must be minimised and preferably backfilled prior to nightfall. Where this is not feasible, they must be covered with a fine mesh when not in use and checked daily for faunal species that may have fallen in (refer to section 4.4 below).
- Escape ramps or planks must also be installed in open trenches to allow faunal species to escape. These must have a 34 degree angle with the greatest height/depth ratio of 1.5:1.
- Reduce the use for razor wire and barbed wire fencing. Electric fences should be avoided where possible.
- Culverts must be installed on roads adjacent to rivers and wetlands to allow for safe passage of small animals.
- Personnel must be prohibited from harming, killing or illegally trapping faunal species.

### 4.2. WALK DOWN PRIOR TO CONSTRUCTION

Responsible Person: Environmental Site Officer (ESO) employed by the Contractor and Environmental Control Officer (ECO)

Prior to construction, the Environmental Site Officer (ESO) employed by the Contractor will carry out a walk-through over the area accompanied by the Environmental Control Officer (ESO). Sensitive habitats important for SCC will be identified and demarcated as no-go areas.

### **4.3. PRE-CLEARING FAUNAL SURVEY**

Responsible Person: ESO

Forty-eight hours prior to clearing activities commencing, the ESO will survey the area to be cleared for the presence of slow moving species such as tortoises as well as for burrows and nests. The survey will be conducted as follows:

- The ESO will walk the area to be cleared to identify habitats such as tree hollows, nests, rocky slabs and outcrops, burrows and fallen logs. These areas will be marked and cordoned off and communicated to relevant site personnel e.g., during toolbox talks.
- These cordoned off areas must be cleared last to allow for a sufficient period for the natural relocation/dispersal of fauna using this habitat (up to 48 hours, but no less than 24 hours), after surrounding vegetation is removed. This will provide species using these areas time to naturally vacate their nests and burrows in response to increased noise and vibration from the nearby machinery.
- Large shrubs and burrows located on the edge of cleared areas must be clearly marked as no-go areas to ensure visibility and prevent accidental clearing.
- Any tortoises encountered in the construction footprint must be captured and relocated to areas of intact habitat, outside of the project area, but within 1-2km of where it was found. Tortoises must be released the same day they are captured and may not be kept overnight. It is recommended that they are transported in well-ventilated boxes that have a substrate on the base to prevent them from sliding around and being injured during transport.

### **4.4. CONSTRUCTION SITE CHECKS AND ACTION PER FAUNAL GROUP**

Responsible Person: ESO

During construction faunal species may be encountered, the following checks must be implemented:

- Any exposed areas such as drains, canals, open pits and trenches that could become pitfall traps for small faunal species must be checked by the ESO daily, ideally early morning before midday heat to prevent individuals succumbing to exposure.
- The project area roads must be checked for roadkill first thing in the morning before activity peaks on site.
- Faunal species may enter the development footprint during construction inadvertently putting themselves within harm's way. As such, checks must be conducted daily and construction staff to contact ESO if fauna species is seen.

The appropriate procedure must be followed if fauna is encountered in any of the above scenarios (trapped or in harm's way). These procedures are detailed below.

#### **4.4.1. SNAKES**

All snakes are to be treated as venomous unless species identification is certain.

- Upon identification that a snake is present, all activities must cease and the area must be cleared of any observers that may be present.

- A trained and qualified snake handler must be called to safely remove and relocate the snake.
- The snake handler must capture the reptile using appropriate equipment which may include:
  - Snake hook
  - Extendable poles
  - Approved snake tongs
  - Suitable container/catch bag for holding the species.
- Once caught, the species must be placed into a box with a clear label stating “Caution – venomous snake” for transport.
- The snake must be released into an identified, suitable release site, preferably within 5km from the development footprint and in intact habitat that will not be developed. The ECO should identify suitable habitat for release prior to construction commencing.
- Snakes must not be intentionally harmed or killed.
- Injured snakes must be taken to a veterinarian for assessment and appropriate treatment.
- Signage identifying the name and contact details of the appointed snake handler must be erected around site. It is recommended that an individual onsite undergoes snake handling training to ensure that if an emergency arises it can be dealt with immediately.

#### **4.4.2. SMALL REPTILES**

Small reptiles such as lizards, skinks, chameleons and geckos can be captured by hand with or without gloves or using a net.

- For species that are smaller than an average hand, it is recommended that gloves are not used to avoid injuring the species.
- When catching these reptiles, it is preferable to grip the animal at the base of the neck/upper back with pressure sufficient to restrain the animal but not kill it.
- Once caught, the animal must be placed in a dry, clean and sterilised calico fauna bag large enough to be tied off. The bag must be placed in a suitable cool, dark container for holding if immediate release is not possible.
- These species must be released into intact vegetation patches that will not be developed. The release must be within 1 to 2 km of where it was found.

#### **4.4.3. LARGE REPTILES**

Large reptiles such as Legavaans/Monitor Lizards require additional force during capture due to the size and strength of the animal. It is recommended that two people are on hand to catch these species.

- Legavaans/Monitors can be caught by taking hold of the base of tail whilst wearing elbow length welding gloves. Care must be taken as monitors will easily swing around and bite.
- Once the animal is under control, a towel or calico bag can be used to cover the head. Once the head is covered, the handler can then take hold of the neck so that it can be lifted without harm to the animal or handler.
- When carried, the animal’s head must be held away from the carrier’s body. It must be noted where the tail is, as it will be used to strike, restraining the tail between elbow and body will prevent this.
- Once caught, the animal is to be placed in a dry, clean and sterilised large, heavy duty hessian sack and secured with a zip tie. Due to the large weave and strength of the material used for

hessian, it is unlikely that any large reptile will be able to rip through the sack. It is noted however that their claws may protrude through the woven gaps, therefore care is to be taken when transporting the sack.

- The sack is to be placed in a suitable cool, dark crate for holding if immediate release is not possible.
- These species must be released into intact vegetation patches that will not be developed. The release must be within 1 to 2 km of where it was found.
- Injured Legavaans/Monitors must be taken to a veterinarian for assessment and appropriate treatment.

#### **4.4.4. AMPHIBIANS**

Frogs can be captured by hand with or without gloves or using a net and relocated to appropriate habitat. All equipment used to capture amphibians, including hands, must be free of chemicals as these species are very sensitive to herbicides, insecticides, petroleum, diesel etc. Not all frogs are reliant on seeps and wetlands for their survival, however since the ESO may not know which species is and isn't, the precautionary approach must be used and all frogs must be relocated and released on the edge of seeps or wetlands.

- Once captured, the captured frogs must be placed in a moist, clean plastic bag for immediate release.
- Only one individual must be placed in each bag i.e. multiple individuals must not be kept in one bag.
- The bags must be expanded with air or some natural vegetation to prevent it from caving in on the frog and damaging it.
- These species must be released into intact patches of vegetation on the edge of seeps, rivers or wetlands that will not be developed. The release must be within 1 to 2 km of where it was found.

#### **4.4.5. SMALL MAMMALS**

Small mammals such as rats, mice and shrews must be removed to suitable habitat.

- Live trapping of small rodents and other fauna can be carried out.
- Gloves must be worn when capturing and handling these species as they can bite.
- A bird net with the rim padded to prevent injury can be used to scoop these animals up if they are trapped.
- Once captured, they can be placed in a clean, dry calico bag that can be tied off.
- Captured animals must be placed in a suitable cool and dark location until released.
- Small mammals have a fast metabolism and it is therefore important they are released the same day they are captured to avoid unnecessary mortalities. In the case of Shrews, these must be released within an hour of capture into intact patches of vegetation on the edge of seeps or wetlands that will not be developed.
- No wire trapping or any other trapping method detrimental to the animal is permitted on or around the site.



#### **4.4.6. LARGE MAMMALS**

Large mammals will typically move away from construction machinery noise and vibrations. In the unlikely event that the species is encountered during pre-clearance or clearance of the site and they do not move away, care must be taken when handling these species.

- If uninjured, the individual must be calmly encouraged to vacate the clearing area. All construction traffic must be stopped in the immediate vicinity to reduce the chance of vehicle related accidents.
- If injured, all operations must cease immediately.
  - The ESO must assess the state of health and injury to the animal and if it is safe, the animal must be captured and placed into a dark, secure, ventilated holding container and taken to a quiet location.
  - If it is unsafe, or not possible to capture the animal, an experienced animal handler must be called to assist with its capture.
- For injured animals, a veterinarian must immediately advise whether the animal can be rehabilitated or whether it must be euthanised. Injured animals must be assessed by a veterinarian within 4 hours of capture.
- Following the capture of injured fauna, an investigation into the cause of the incident must be undertaken and mitigation measures implemented to avoid future incidents.

#### **4.5. FAUNA INJURIES AND MORTALITIES**

Responsible Person: ESO

If fauna are injured due to construction activities in the project area, the following procedures must be followed:

- Any fauna that is injured must be caught and treated by a veterinarian and released back on site once recovered. If the veterinarian determines the animal cannot be treated, it must be euthanised. Contact details of an appropriately specialised veterinarian must be readily available. If a SCC is euthanised, the carcass must be preserved (e.g., individually frozen in a plastic bag) until such time as it can be sent to SANBI, before the end of the construction phase.

If faunal mortalities are found in the project area, the following procedures must be followed:

- The ESO must be contacted and advised of the situation.
- A photograph and GPS location of the faunal species must be recorded and the species identified.
- Following the removal and appropriate disposal of deceased fauna, an investigation into the cause of the incident must be undertaken.
- If the animal is not diseased or did not die from poisoning, the carcass can be moved to an area that will not place other fauna attracted to carrion in danger. This will allow the natural process of decay and scavenging to occur. Alternatively, the animal can be buried at an approved location by the developer, preferably in previously modified land within the project area.

- If the species died as a result of poisoning or disease, care must be taken not to transfer this to other species. The carcass must be either deeply buried or taken to the local veterinarian to be incinerated.
- A register of faunal mortalities must be maintained to document the location and frequency of mortality and the fauna species most susceptible to injury and death, to enable on-going modifications to fauna conservation management strategies where necessary.

## 5. MONITORING PLAN

### 5.1. MONITORING REQUIREMENTS

Monitoring is required to ensure that the recommendations contained within this report are effective and successful. Indicators that must be monitored are outlined below and in Table 5.1.

**Table 5.1: Monitoring Actions, indicators, and timeframes for the implementation of the Plant Rescue and Protection Plan**

Monitoring Action	Indicator	Timeframe	Responsible
Report showing evidence of pre-construction walkthrough.	Clear, documented record of the pre-construction walkthrough identifying sensitive habitat and proof of demarcation (maps, localities and photographs.	Once off prior to construction	Contractor/ESO/ECO
Report logs showing evidence of construction site checks for trapped fauna or fauna within harm's way.	Report logs showing evidence of site being checked.	Daily	Contractor/ESO
Faunal Relocation Register	Register documenting faunal species rescued and relocated. This must include the date, location of where it was found and where it was released as well as the name of the species.	Ad Hoc Each time a species is removed and relocated from the construction footprint	Contractor/ESO
Faunal Mortality Register	Register documenting faunal mortalities within the project area due to construction related activities. This must include the date, location where it was found and the name of the species. It must also include the reason for the mortality and corrective actions that will be implemented to reduce further mortalities.	Ad Hoc Each time a species is removed and relocated from the construction site	Contractor/ESO

## **5.2. STORAGE OF DATA**

All monitoring data must be collected and stored electronically on a central database that is easily accessible to all parties.

Data from each monitoring event must be entered into a spreadsheet so that this can be easily analysed at any given time.

All photographs must be labelled with the date taken and location in which they were taken and species name, where relevant.

## **5.3. REPORTING**

Management measures implemented and success achieved must be clearly documented. Compliance with the Faunal Relocation Plan must be documented by the ECO and all reports must be maintained within the site office and for a period of 5 years post construction.

This plan must be seen as a working document and must be updated as and when required or if any of the recommended measures need to be revised.

A detailed annual report must be submitted to the managing authority/holder of the EA. If the management plan needs to be adjusted, it is recommended that the monitoring report is reviewed by an ecologist who can make recommendations on adjustments that are required.

## 6. ROLES AND RESPONSIBILITIES

The holder of the EA, the Contractors and the ECO are responsible for ensuring this Fauna Relocation Plan is implemented. The roles and responsibilities for each of them are outlined in Table 6.1 below.

**Table 6.1: Roles and responsibilities associated with implementing the Fauna Relocation Plan.**

Role	Responsibility
Applicant (Holder of EA)	<p>The Applicant (holder of Environmental Authorisation (EA)) bears the overarching responsibility for ensuring compliance with the conditions outlined within the EA.</p> <p>Furthermore, they are responsible for appointing appropriately qualified Contractors to co-ordinate and supervise the different tasks outlined in this plan, ensuring the appointed contractor has sufficient resources to implement the plan and to appoint an independent and suitably qualified ECO to perform the responsibilities outlined in this report.</p>
Contractor/ESO	<p>The Contractor together with the appointed Environmental Site Officer is responsible for implementing the Fauna Relocation Plan during the construction phase of the project.</p> <p>Specific actions for which the contractor and ESO are responsible for include the following (this is not a comprehensive list, but only indicative of the duties to be carried out in this regard):</p> <ul style="list-style-type: none"> <li>• Implementing this management plan.</li> <li>• Ensuring all personnel comply with the requirements of the plan.</li> <li>• Reporting on the effectiveness of the implementation</li> <li>• Monitoring the site.</li> <li>• Analysing the data.</li> <li>• Making recommendations on remedial action when required.</li> <li>• Writing progress and annual reports.</li> </ul>
ECO	<p>The ECO is responsible for auditing and verifying the implementation of the management plan during the relevant phases of the project. This includes the following:</p> <ul style="list-style-type: none"> <li>• Identifying and demarcating sensitive areas.</li> <li>• Reviewing and inspecting Contractor's written records that illustrate compliance with the Environmental Management Plan (EMPr).</li> <li>• Recommending and/or developing corrective actions when there is non-compliance or when the measures to protect fauna are not effective.</li> </ul>

## 7. REFERENCES

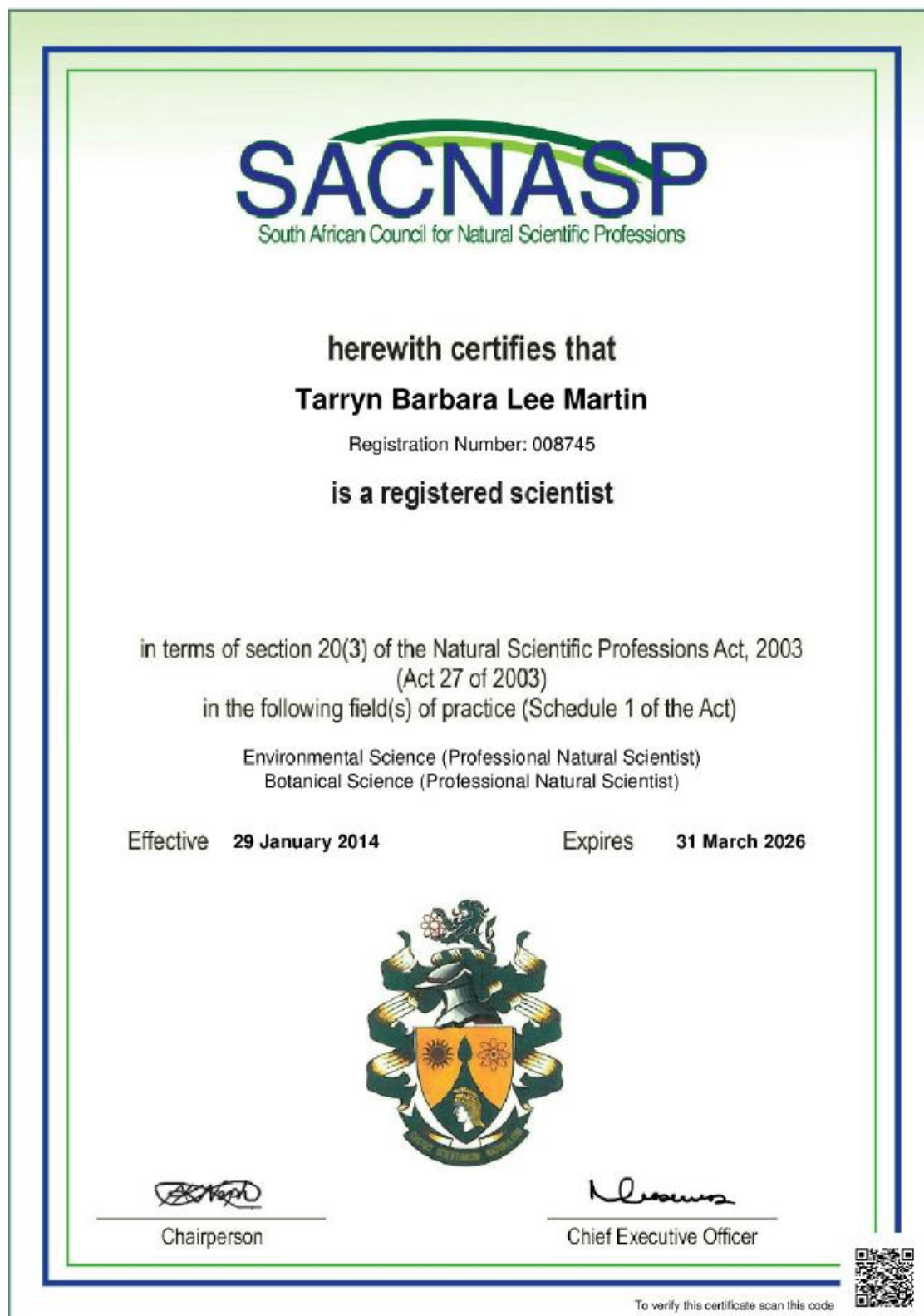
---

Biodiversity Africa (2025). Ecological Walkthrough Report of the Proposed 132kV Overhead Powerline between existing Bon Espirange and Kudusberg Substations.

South African National Biodiversity Institute (SANBI). 2020. Species Environmental Assessment Guideline. Guidelines for the implementation of the Terrestrial Fauna and Terrestrial Flora Species Protocols for environmental impact assessments in South Africa. South African National Biodiversity Institute, Pretoria. Version 1.2020.

# APPENDIX 1: PROOF OF SACNASP REGISTRATION AND HIGHEST QUALIFICATION

Application for Professional Natural Science in the field of Zoology is currently awaiting approval.





**herewith certifies that**

**Amber Leah Jackson**

Registration Number: 100125/12

**is a registered scientist**

in terms of section 20(3) of the Natural Scientific Professions Act, 2003  
(Act 27 of 2003)

in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science (Candidate Natural Scientist)

Effective **15 August 2012**

Expires **31 March 2026**



A handwritten signature in black ink, likely belonging to the Chairperson.

Chairperson

A handwritten signature in black ink, likely belonging to the Chief Executive Officer.

Chief Executive Officer



To verify this certificate scan this code





# RHODES UNIVERSITY

THIS IS TO CERTIFY THAT

TARRYN BARBARA LEE MARTIN

WAS THIS DAY AT A CONGREGATION OF THE UNIVERSITY  
ADMITTED TO THE DEGREE OF

**MASTER OF SCIENCE**

IN

**BOTANY**

**WITH DISTINCTION**

GRAHAMSTOWN  
10 APRIL 2010



VICE CHANCELLOR

DEAN OF THE FACULTY OF SCIENCE

REGISTRAR



*we certify that*

*Amber Leah Jackson*

*was admitted to the degree of*

*Master of Philosophy  
in Environmental Management*

*on 9 June 2011*

A handwritten signature in black ink, reading 'Alan Price'.

Vice-Chancellor



A handwritten signature in black ink, reading 'Hugh Amoore'.

Registrar

## APPENDIX 2: CV

### CONTACT DETAILS

<b>Name</b>	<b>Amber Jackson</b>
<b>Name of Company</b>	<b>Biodiversity Africa</b>
<b>Designation</b>	Director
<b>Profession</b>	Faunal Specialist and Environmental Manager
<b>E-mail</b>	<a href="mailto:amber@biodiversityafrica.com">amber@biodiversityafrica.com</a>
<b>Office number</b>	+27 (0)78 340 6295
<b>Education</b>	2011 M. Phil Environmental Management (University of Cape Town) 2008 BSc (Hons) Ecology, Environment and Conservation (University of the Witwatersrand) 2007 BSc 'Ecology, Environment and Conservation' and Zoology (WITS)
<b>Nationality</b>	<b>South African</b>
<b>Professional Body</b>	<b>SACNASP:</b> South African Council for Natural Scientific Profession (100125/12) <b>ZSSA:</b> Zoological Society of Southern Africa <b>HAA:</b> Herpetological Association of Southern Africa <b>IAIASa:</b> Member of the International Association for Impact Assessments South Africa
<b>Key areas of expertise</b>	<ul style="list-style-type: none"> <li>• Biodiversity Surveys and Impact Assessments</li> <li>• Environmental Impact Assessments</li> <li>• Critical Habitat Assessments</li> <li>• Biodiversity Management and Monitoring Plans</li> </ul>

### PROFILE

Amber has over ten years' experience in environmental consulting and has managed projects across various sectors including mining, agriculture, forestry, renewable energy, housing, coastal and wetland recreational infrastructure. Most of these projects required lender finance and therefore met both in-country, lender and sector specific requirements.

Amber completed the IFC lead and Swiss funded programme in Environmental and Social Risk Management course in 2018. The purpose of the course was to upskill Sub-Saharan African environmental consultants to increase the uptake of E&S standards by Financial Institutions.

Amber specialises in terrestrial vertebrate faunal assessments. She has conducted large scale faunal impact assessments that are to international lender's standards in Mozambique, Tanzania, Lesotho and Malawi. In South Africa her faunal impact assessments comply with the protocols for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity and follows the SANBI Species Environmental Assessment Guideline. Her specialist input goes beyond impact assessments and includes faunal opportunities and constraints assessments, Critical Habitat Assessments, Biodiversity related Management Plans and Biodiversity Monitoring Programmes.

Amber holds a BSc (Zoology and Ecology, Environment & Conservation) and BSc (Hons) in Ecology, Environment & Conservation from WITS University and an MPhil in Environmental Management from University of Cape Town. Amber's honours focused on the landscape effects on Herpetofauna in Kruger National Park and her Master's thesis focused on the management of social and natural aspects of environmental systems with a dissertation in food security that investigated the complex food system of informal and formal distribution markets

### EMPLOYMENT EXPERIENCE

#### **Director and Faunal Specialist, Biodiversity Africa** *July 2021 - present*

- Faunal assessments for local and international EIAs in Southern Africa
- Identifying and mapping habitats and sensitive areas
- Designing and implementing biodiversity management and monitoring plans
- Critical Habitat Assessments
- Large ESIA studies
- Managing budgets

## **Principal Environmental Consultant and Faunal,**

Coastal and Environmental Services

*September 2011-June 2021*

- Faunal and ecological assessments for local and international EIAs in Southern Africa
- Identifying and mapping habitat and sensitive areas
- Designing and implementing biodiversity management and monitoring plans
- Critical Habitat Assessments
- Large ESIA studies
- Coordinating specialists and site visits
- Faunal Impact Assessment
- Project Management, including budgets, deliverables and timelines.
- Environmental Impact Assessments and Basic Assessments project
- Environmental Control Officer
- Public/client/authority liaison
- Mentoring and training of junior staff

## **COURSES**

- **Herpetological Association of Southern Africa Conference- Cape St Frances** September 2019
- **International Finance Corporation Environmental and Social Risk Management (ESRM) Program** January – November 2018
- **IAIA WC EMP Implementation Workshop** 27 February 2018
- **IAIAsa National Annual Conference** August 2017  
Goudini Spa, Rawsonville.
- **Biodiversity & Business Indaba, NBBN** April 2017  
Theme: Moving Forward Together (Partnerships & Collaborations)
- **Snake Awareness, Identification and Handling course, Cape Reptile Institute (CRI)** November 2016
- **Coaching Skills programme, Kim Coach** November 2016
- **Western Cape Biodiversity Information Event, IAIAsa** May 2016  
Theme: Biodiversity offsets & the launch of a Biodiversity Information Tool
- **Photography Short Course** 2015.  
Cape Town School of Photography,
- **Mainstreaming Biodiversity into Business: WHAT, WHY, WHEN and HOW** June 2014 Hosted by Dr Marie Parramon Gurney on behalf of the NBBN at the Rhodes Business School
- **IAIAsa National Annual Conference** September 2013  
Thaba’Nchu Sun, Bloemfontein
- **St Johns Life first aid course** July 2012

## **CONSULTING EXPERIENCE**

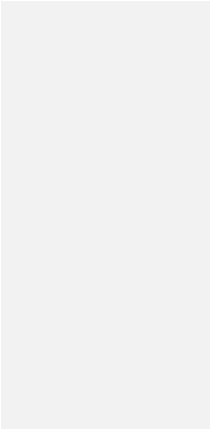
### **International Projects**

- 2018-Crooks Brothers Post EIA Work- Environmental and Social EMPr, Policies, E&S Management Plans and Monitoring Programmes
- 2018-Triton Ancuabe Graphite Mine (ESHIA), Mozambique. IFC Standards.
- 2016-Bankable Feasibility Study of Simandou Infrastructure Project – Port and Railway Summary of critical habitat, biodiversity offset plan and monitoring and evaluation plan.
- 2016-Lurio Green Resources Forestry Projects ESIA project upgrade to Lender standards including IFC, EIB, FSC and AfDB.
- 2014-Green Resources Woodchip and MDF plant (EPDA).
- 2014-Niassa Green Resources Forestry Projects ESIA to Lender standards including IFC, EIB, FSC and AfDB.

- 2020-Kenmare Faunal Biodiversity Management Plan, Mozambique.
- 2020-Kenmare Faunal Monitoring Programme (year 1)- Baseline, Mozambique.
- 2019-Kenmare addendum ESIA Faunal Impact Assessment, Mozambique.
- 2019-Kenmare infrastructure corridor ESIA Faunal Impact Assessment, Mozambique.
- 2019/20-Olam Cocoa Plantation Faunal Impact Assessment, Tanzania.
- 2019-JCM Solar Voltaic project Faunal desktop critical habitat assessment, Cameroon.
- 2018-Suni Resources Balama Graphite Mine Project Faunal Impact Assessment, Mozambique.
- 2017/18-Battery Minerals Montepuez Graphite Mine Project Faunal Impact Assessment, Mozambique.
- 2017-Triton Minerals Nicanda Hills Graphite Mine Project Faunal Impact Assessment, Mozambique.
- 2017-Sasol Biodiversity Assessment, Mozambique.
- 2014-Lesotho Highlands Water Project Faunal Impact Assessment, Lesotho.
- 2012-Malawi Monazite mine Projects (ESIA) EMP ecological management contribution
- Liberia Palm bay & Butow (ESIA)
- PGS Seismic Project (ESIA), Mozambique.

#### **South African Projects**

- 2018-Port St Johns Second Beach Coastal Infrastructure Project - E&S Risk Assessment
- 2015-Blouberg Development Initiative- E&S Risk Assessment
- 2019-Boulders Powerline BA Faunal desktop impact assessment, WC, SA.
- 2019-Ramotshere housing development BA Faunal desktop impact assessment, NW, SA.
- 2019-Cape Agulhas Municipality Industrial development faunal impact assessment, WC, SA.
- 2019-SANSA Solar PV BA Faunal desktop impact assessment, WC, SA.
- 2019-Wisson Coal to Urea Faunal desktop assessment, Mpumalanga.
- 2019-Assessment Boschendal Estate Faunal Opportunities and Constraints, WC, SA.
- 2019-Ganspan-Pan Wetland Reserve Recreational and Tourist Development Avifaunal Impact Assessment, NC, SA.
- 2018-City of Johannesburg Municipal Reserve Proclamation for Linksfield Ridge and Northcliff Hill Faunal Assessment, South Africa.
- 2017-Augrabies falls hydro-electric project Hydro-SA Faunal Impact Assessment.
- Port St Johns Second Beach Coastal Infrastructure Project (EIA), South Africa.
- Woodbridge Island Revetment checklist.
- Belmont Valley Golf Course and Makana Residential Estate (EIA)
- Belton Farm Eco Estate (BA).
- Ramotshere housing development (BA).
- G7 Brandvalley Wind Energy Project (EIA)
- G7 Rietkloof Wind Energy Project (EIA)
- G7 Brandvalley Powerlines (BA)
- G7 Rietkloof Powerlines (BA)
- Boschendal wine estate Hydro-electric schemes (BA, 24G and WULA)
- Mossel Bay Wind Energy Project (EIA)
- Mossel Bay Powerline (BA) 132kV interconnection
- Inyanda Farm Wind Energy (EIA)
- Middleton Wind Energy (EIA)
- Peddie Wind Energy (EIA)
- Cookhouse Wind Energy Project (EIA)

- 
- Haverfontein Wind Energy Project (EIA)
  - Plan 8 Wind Energy Project (EIA)
  - Brakkefontein Wind Energy Project (EIA)
  - Grassridge Wind Energy Project (EIA) (Coega)
  - St Lucia Wind Energy Project (EIA)
  - ACSA ECO CT (Lead ECO)
  - Enel Paleisheuwel Solar farm (Lead ECO)
  - NRA Caledon road upgrade ECO
  - Solar Capital DeAar Solar farm annual audits
  - Eskom Pinotage substation WUL offset compliance

## Ms Tarryn Martin

<b>Name</b>	<b>Tarryn Martin</b>
<b>Name of Company</b>	<b>Biodiversity Africa</b>
<b>Designation</b>	Director
<b>Profession</b>	Botanical Specialist and Environmental Manager
<b>E-mail</b>	<a href="mailto:tarryn@biodiversityafrica.com">tarryn@biodiversityafrica.com</a>
<b>Office number</b>	+27 (0)71 332 3994
<b>Education</b>	2010: Master of Science with distinction (Botany) 2004: Bachelor of Science (Hons) in African Terrestrial Vertebrate Biodiversity 2003: Bachelor of Science
<b>Nationality</b>	<b>South African</b>
<b>Professional Body</b>	<b>SACNASP:</b> South African Council for Natural Scientific Profession: Professional Natural Scientist (400018/14) <b>SAAB:</b> Member of the South African Association of Botanists <b>IAIASa:</b> Member of the International Association for Impact Assessments South Africa Member of Golden Key International Honour Society
<b>Key areas of expertise</b>	<ul style="list-style-type: none"><li>• Biodiversity Surveys and Impact Assessments</li><li>• Environmental Impact Assessments</li><li>• Critical Habitat Assessments</li><li>• Biodiversity Management and Monitoring Plans</li></ul>

## PROFILE

Tarryn has over ten years of experience working as a botanist, nine of which are in the environmental sector. She has worked as a specialist and project manager on projects within South Africa, Mozambique, Lesotho, Zambia, Tanzania, Cameroon and Malawi.

She has extensive experience writing botanical impact assessments, critical habitat assessments, biodiversity management plans, biodiversity monitoring plans and Environmental Impact Assessments to International Standards, especially to those of the International Finance Corporation (IFC). Her experience includes working on large mining projects such as the Kenmare Heavy Minerals Mine, where she monitored forest health, undertook botanical impact assessments for their expansion projects and designed biodiversity management and monitoring plans. She has also project managed Environmental Impact Assessments for graphite mines in northern Mozambique and has a good understanding of the Mozambique Environmental legislation and processes.

Tarryn holds a BSc (Botany and Zoology), a BSc (Hons) in African Vertebrate Biodiversity and an MSc with distinction in Botany from Rhodes University. Tarryn's Master's thesis examined the impact of fire on the recovery of C<sub>3</sub> and C<sub>4</sub> Panicoid and non-Panicoid grasses within the context of climate change for which she won the Junior Captain Scott-Medal (Plant Science) for producing the top MSc of 2010 from the South African Academy of Science and Art as well as an Award for Outstanding Academic Achievement in Range and Forage Science from the Grassland Society of Southern Africa. Tarryn is a professional member of the South African Council for Natural Scientific Professionals (since 2014).

### EMPLOYMENT EXPERIENCE

#### **Director and Botanical Specialist, Biodiversity Africa**

*July 2021 - present*

- Botanical and ecological assessments for local and international EIAs in Southern Africa
- Identifying and mapping vegetation communities and sensitive areas

- Designing and implementing biodiversity management and monitoring plans
- Designing rehabilitation plans
- Designing alien management plans
- Critical Habitat Assessments
- Large ESIA studies
- Managing budgets

**Principal Environmental Consultant, Branch Manager and Botanical Specialist,**  
Coastal and Environmental Services

*May 2012-June 2021*

- Botanical and ecological assessments for local and international EIAs in Southern Africa
- Identifying and mapping vegetation communities and sensitive areas
- Designing and implementing biodiversity management and monitoring plans
- Designing rehabilitation and biodiversity offset plans
- Designing alien management plans
- Critical Habitat Assessments
- Large ESIA studies
- Managing budgets
- Cape Town branch manager
- Coordinating specialists and site visits

**Accounts Manager, Green Route DMC**

*October 2011- January 2012*

- Project and staff co-ordination
- Managing large budgets for incentive and conference groups travelling to southern Africa
- Creating tailor-made programs for clients
- Negotiating rates with vendors and assisting with the ground management of inbound groups to ensure client satisfaction.

**Camp Administrator and Project Co-ordinator, Windsor Mountain International Summer Camp, USA**

*April 2011 - September 2012*

- Co-ordinated staff and camper travel arrangements, main camp events and assisted with marketing the camp to prospective families.

**Freelance Project Manager, Green Route DMC**

*November 2010 - April 2011*

- Project and staff co-ordination
- Managing large budgets for incentive and conference groups travelling to southern Africa
- Creating tailor-made programs for clients
- Negotiating rates with vendors and assisting with the ground management of inbound groups to ensure client satisfaction.

**Camp Counselor, Windsor Mountain Summer Camp, USA**

*June 2010 - October 2010*

**NERC Research Assistant, Botany Department, Rhodes University, Grahamstown in collaboration with Sheffield University, Sheffield, England**

*April 2009 - May 2010*

- Set up and maintained experiments within a common garden plot experiment
- collected, collated and entered data
- Assisted with the analysis of the data and writing of journal articles



**Head Demonstrator, Botany Department, Rhodes University**

*March 2007 - October 2008*

**Operations Assistant, Green Route DMC**

*September 2005 - February 2007*

- Project and staff co-ordination
- Managing large budgets for incentive and conference groups travelling to southern Africa
- Creating tailor-made programs for clients
- Negotiating rates with vendors and assisting with the ground management of inbound groups to ensure client satisfaction

**PUBLICATIONS**

- Ripley, B.; Visser, V.; Christin, P.A.; Archibald, S.; Martin, T and Osborne, C. Fire ecology of C<sub>3</sub> and C<sub>4</sub> grasses depends on evolutionary history and frequency of burning but not photosynthetic type. *Ecology*. 96 (10): 2679-2691. 2015
- Taylor, S.; Ripley, B.S.; Martin, T.; De Wet, L-A.; Woodward, F.I.; Osborne, C.P. Physiological advantages of C<sub>4</sub> grasses in the field: a comparative experiment demonstrating the importance of drought. *Global Change Biology*. 20 (6): 1992-2003. 2014
- Ripley, B; Donald, G; Osborne, C; Abraham, T and Martin, T. Experimental investigation of fire ecology in the C<sub>3</sub> and C<sub>4</sub> subspecies of *Alloteropsis semialata*. *Journal of Ecology*. 98 (5): 1196 - 1203. 2010
- South African Association of Botanists (SAAB) conference, Grahamstown. Title: Responses of C<sub>3</sub> and C<sub>4</sub> Panicoid and non-Panicoid grasses to fire. January 2010
- South African Association of Botanists (SAAB) conference, Drakensberg. Title: Photosynthetic and Evolutionary determinants of the response of selected C<sub>3</sub> and C<sub>4</sub> (NADP-ME) grasses to fire. January 2008

**COURSES**

- Rhodes University and CES, Grahamstown
- EIA Short Course 2012
- Fynbos identification course, Kirstenbosch, 2015.
- Photography Short Course, Cape Town School of Photography, 2015.
- Using Organized Reasoning to Improve Environmental Impact Assessment, 2018, International IAIA conference, Durban

**CONSULTING  
EXPERIENCE**

**International Projects**

- 2020 – 2021: Project manager for the 2Africa subsea cable ESIA in Mozambique.
- 2020 – 2021: Project manager for the Category B EIA for the Wihinana Graphite Mine, Cabo delgado, Mozambique
- 2020 – 2021: Project manager for the category B exploration ESIA for Sofala Heavy Minerals Mine, Inhambane, Mozambique
- 2020: Critical Habitat Assessment for a graphite mine in Cabo Delgado, Mozambique. This assessment was to IFC standards.
- 2020: Analysed the botanical dataset for Lurio Green Resources and provided comment on the findings and gaps.
- 2020: Biodiversity Management Plan and Monitoring Plan for mine at Pilivilli in Nampula Province, Mozambique. This assessment was to IFC standards.
- 2019: Botanical Assessment for a cocoa plantation, Tanzania. This assessment was to IFC standards.
- 2019: Critical Habitat Assessment, Biodiversity Management Plan and Ecosystem Services Assessment for JCM Solar Farm in Cameroon. This assessment was to IFC standards.
- 2019: Undertook the Kenmare Road and Infrastructure Botanical Baseline Survey and Impact Assessment for an infrastructure corridor that will link the existing mine at Moma to the new proposed mine at Pillivilli in Nampula Province, Mozambique. This assessment was to IFC standards.
- 2012 – Present: Kenmare Terrestrial Monitoring Program Project Manager and Specialist Survey, Nampula Province, Mozambique.

- 2018: Conducted a field survey and wrote a botanical report to IFC standards for the proposed Balama Graphite Mine Environmental and Social Impact Assessment (ESIA) in Cabo Delgado Province, Mozambique.
- 2018: Co-authored the critical habitat assessment chapter for the proposed Kenmare Pilivilli Heavy Minerals Mine.
- 2018: Authored the Conservation Efforts chapter for the Kenmare Pilivilli Heavy Minerals Mine.
- 2017-2018: Co-authored and analysed data for the Kenmare Bioregional Survey of *Icuria dunensis* (species trigger for critical habitat) in Nampula Province, Mozambique. This was for a mining project that needed to be IFC compliant.
- 2017: Conducted a field survey and wrote a botanical report to IFC standards for the proposed Ancuabe Graphite Mine Environmental and Social Impact Assessment (ESIA) in Cabo Delgado Province, Mozambique.
- 2017-2018: Managed the Suni Resources Montepuez Graphite Mine Environmental Impact Assessment. This included the management of ten specialists, the co-ordination of their field surveys, regular client liaison and the writing of the Environmental Impact Assessment Report which summarised the specialists findings, assessed the impacts of the proposed mine on the environment and provided mitigation measures to reduce the impact.  
I was also the lead botanist for this baseline survey and impact assessment and undertook the required field work and analysed the data and wrote the report.
- 2017: Undertook the botanical baseline survey and impact assessment for the proposed Kenmare Pilivilli Heavy Mineral Mine in Nampula Province, Mozambique. This was to IFC Standards.
- 2017: Ecological Survey for the Megaruma Mining Limitada Ruby Mine Exploration License, Cabo Delgado, Mozambique.
- 2016: Undertook the botanical baseline survey and impact assessment, wrote an alien invasive management plan and co-authored the biodeiversity monitoring plan for this farm. The project was located in Zambezia Province, Mozambique.
- 2015-2016: Conducted the Triton Minerals Nicanda Hills Graphite Mine Botanical Survey and Impact Assessment. Was also the project manager and specialist co-ordinator for this project. The project was located in Cabo Delgado Province, Mozambique.
- 2015: Was part of the team that undertook a Critical Habitat Assessment for the Nhangonzo Coastal Stream site at Inhassora in Mozambique that Sasol intend to establish drill pads at. This project needed to meet the IFC standards.
- 2014: Lurio Green Resources Wood Chip Mill and Medium Density Fibre-board Plant, Project Manager and Ecological Specialist, Nampula Province, Mozambique. 2014-2015.
- 2013-2014: LHDA Botanical Survey, Baseline and Impact assessment, Lesotho.
- 2014: Biotherm Solar Voltaic Ecological Assessment, Zambia.
- 2013-2014: Lurio Green Resources Plantation Botanical Assessment, Vegetation and Sensitivity Mapping, Specialist Co-ordination, Nampula Province, Mozambique.
- 2013: Syrah Resources Botanical Baseline Survey and Ecological Assessment., Cabo Delgado Mozambique.
- 2013-2014: Baobab Mining Ecological Baseline Survey and Impact Assessment, Tete, Mozambique.

#### **South African Projects**

- 2021 - Present: Project Manager for the Sturdee Energy Solar PV facility, Western Cape
- 2021: Ecological Assessment for the Sturdee Energy Solar PV facility, Western Cape
- 2021: Rehabilitation plan for a housing development (Hope Village)
- 2020: Ecological Assessment for the Eskom Juno-Gromis Powerline deviation, Western Cape
- 2020: Project Manager for the Basic Assessment for SANSA development at Matjiesfontein (Western Cape). Project received authorization in 2021.

- 2020: Ecological Assessment for construction of satellite antennae, Matjiesfontein, Western Cape
- 2019: Ecological Assessment for a wind farm EIA, Kleinzee, Northern Cape
- 2019: Ecological Assessment for two housing developments in Zeerust, North West Province
- 2019: Botanical Assessment in Retreat, Cape Town for the DRDLR land claim.
- 2019: Cape Agulhas Municipality Botanical Assessment for the expansion of industrial zone, Western Cape, South Africa, 2019.
- 2018: Ecological Assessment for the construction of a farm dam in Greyton, Western Cape.
- 2018: Conducted the Ecological Survey for a housing development in Noordhoek, Cape Town
- 2018: Conducted the field survey and developed an alien invasive management plan for the Swartland Municipality, Western Cape.
- 2017: Undertook the field survey and co-authored a coastal dune study that assesses the impacts associated with the proposed rezoning and subdivision of Farm Bookram No. 30 to develop a resort.
- 2017: Project managed and co-authored a risk assessment for the use of Marram Grass to stabilise dunes in the City of Cape Town.
- 2015-2016: iGas Saldanha to Ankerlig Biodiversity Assessment Project Manager, Saldanha.
- 2015: Innowind Ukomoleza Wind Energy Facility Alien Invasive Management Plan, Eastern Cape Province, South Africa.
- 2015: Savannah Nxuba Wind Energy Facility Powerline Ecological Assessment, ground truthing and permit applications, Eastern Cape South Africa.
- 2014: Cob Bay botanical groundtruthing assessment, Eastern Cape, South Africa.
- 2013-2016: Dassiesridge Wind Energy Facility Project Manager, Eastern Cape, South Africa.
- 2013: Harvestvale botanical groundtruthing assessment, Eastern Cape, South Africa.
- 2012: Tsitsikamma Wind Energy Facility Community Power Line Ecological Assessment, Eastern Cape, South Africa.
- 2012: Golden Valley Wind Energy Facility Power Line Ecological Assessment, Eastern Cape, South Africa.
- 2012: Middleton Wind Energy Facility Ecological Assessment and Project Management, Eastern Cape, South Africa.
- 2012: Mossel Bay Power Line Ecological Assessment, Western Cape, South Africa.
- 2012: Groundtruthing the turbine sites for the Waainek Wind Energy Facility, Eastern Cape, South Africa.
- 2012: Toliara Mineral Sands Rehabilitation and Offset Strategy Report, Madagascar.