
REVEGETATION AND HABITAT REHABILITATION PLAN FOR THE 132KV OVERHEAD POWERLINE BETWEEN EXISTING BON ESPIRANGE AND KOMSBERG SUBSTATIONS IN THE WESTERN AND NORTHERN CAPE PROVINCES

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Glossary of Terms

Alien Invasive Species refers to an exotic species that can spread rapidly and displace native species causing damage to the environment.

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).

Critical Biodiversity Areas (CBAs) are areas of high biodiversity and ecological value that are required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure. These include:

- All areas required to meet biodiversity pattern (e.g. species, ecosystems) targets;
- Critically Endangered (CR) ecosystems (terrestrial, wetland and river types);
- All areas required to meet ecological infrastructure targets, which are aimed at ensuring the continued existence and functioning of ecosystems and delivery of essential ecosystem services; and
- Critical corridors to maintain landscape connectivity (WCBSP, 2017).

Ecological Support Areas (ESAs) are areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of Protected Areas (PAs) or CBAs, and are often vital for delivering ecosystem services. They support landscape connectivity, encompass the ecological infrastructure from which ecosystem goods and services flow, and strengthen resilience to climate change. They include features such as regional climate adaptation corridors, water source and recharge areas, riparian habitat surrounding rivers or wetlands, and Endangered vegetation (WCBSP, 2017).

Habitat Fragmentation occurs when large expanses of habitat are transformed into smaller patches of discontinuous habitat units isolated from each other by transformed habitats such as farmland.

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.

Abbreviations

| | |
|---------------|--|
| AIPS | Alien Invasive Plant Species |
| CBA | Critical Biodiversity Area |
| EA | Environmental Authorisation |
| ECO | Environmental Control Officer |
| EMPr | Environmental Management Programme |
| ESA | Ecological Support Area |
| masl | Meters above sea level |
| MW | Mega Watt |
| NEM:BA | National Environmental Management Biodiversity Act |
| ONA | Other Natural Area |
| PA | Protected Area |
| PAOI | Project Area of Influence |
| SANBI | South African National Biodiversity Institute |
| WEF | Wind Energy Facility |

1. INTRODUCTION

1.1. PROJECT BACKGROUND

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 (OHPL) 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).

A recommendation from the Terrestrial Biodiversity Assessment was to compile site-specific Re-vegetation and Habitat Rehabilitation Plan as part of the final Environmental Management Plan (EMPr).

1.2. PURPOSE AND OBJECTIVES

The purpose of the Re-vegetation and Habitat Rehabilitation Plan is to ensure that areas that are cleared or impacted on during the construction phase, but which are not required during the operational phase, are re-vegetated and rehabilitated to ensure the following:

- Re-vegetate disturbed areas to an acceptable state by re-establishing vegetation cover with suitable species, so that remaining biodiversity features are not compromised.
- Re-instate ecological processes and function and ensure that further degradation does not occur.
- Re-vegetate the impacted and disturbed areas to reduce the risk of wind and water erosion in these areas which, if not managed properly, could result in further and unnecessary degradation of biodiversity within the project area.
- Prevent infestation of the project area with alien invasive plant species.
- Soften the visual impact of the development.

This management plan is closely aligned with several other management plans for the project, and as such, must be read in conjunction with these. Of relevance to this plan are the Alien Invasive Management Plan, Plant Search and Rescue Plan, and Erosion Management Plan.

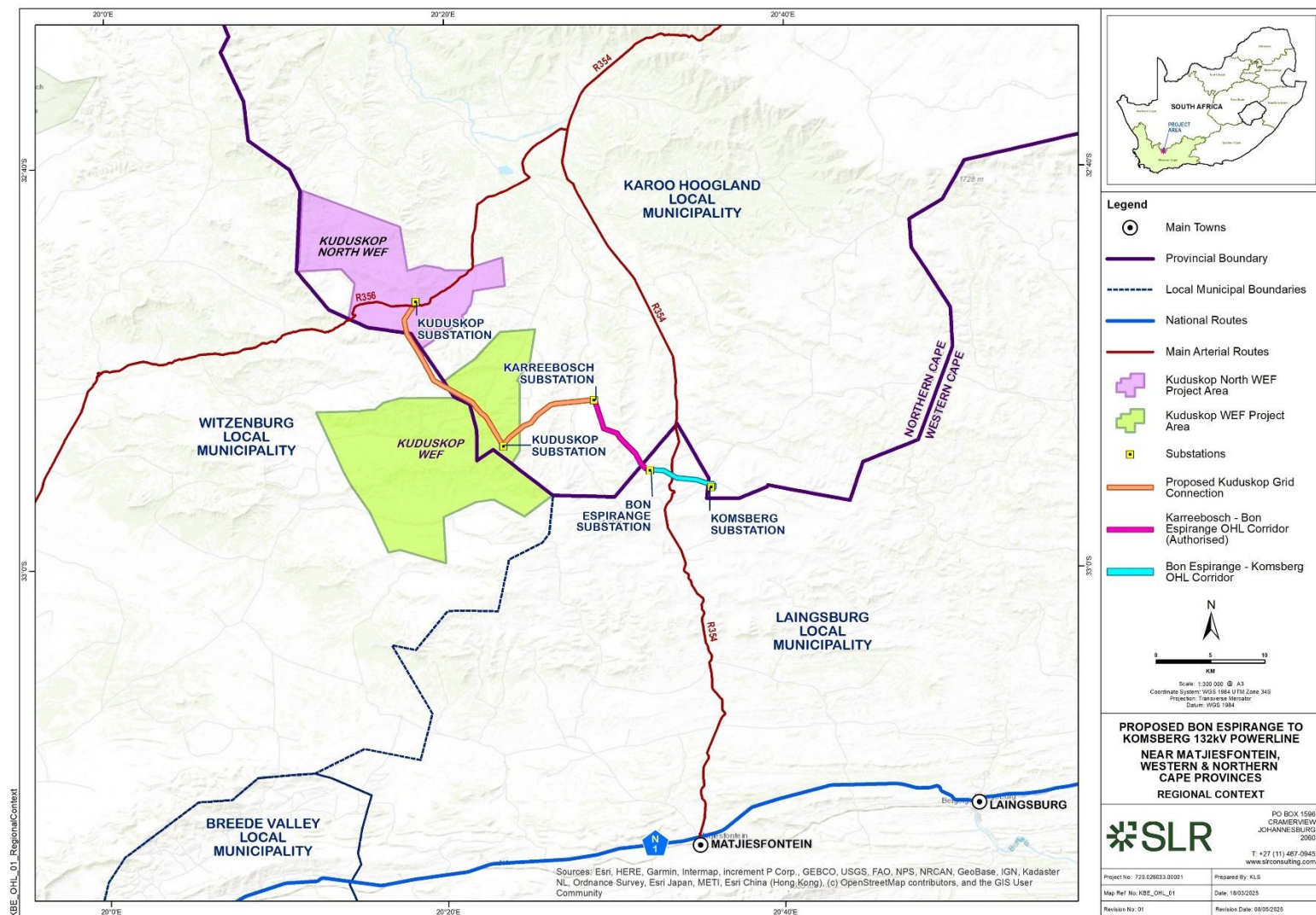


Figure 1.1: Map illustrating the location of the project area in relation to Matjiesfontein, Laingsburg and the R34.

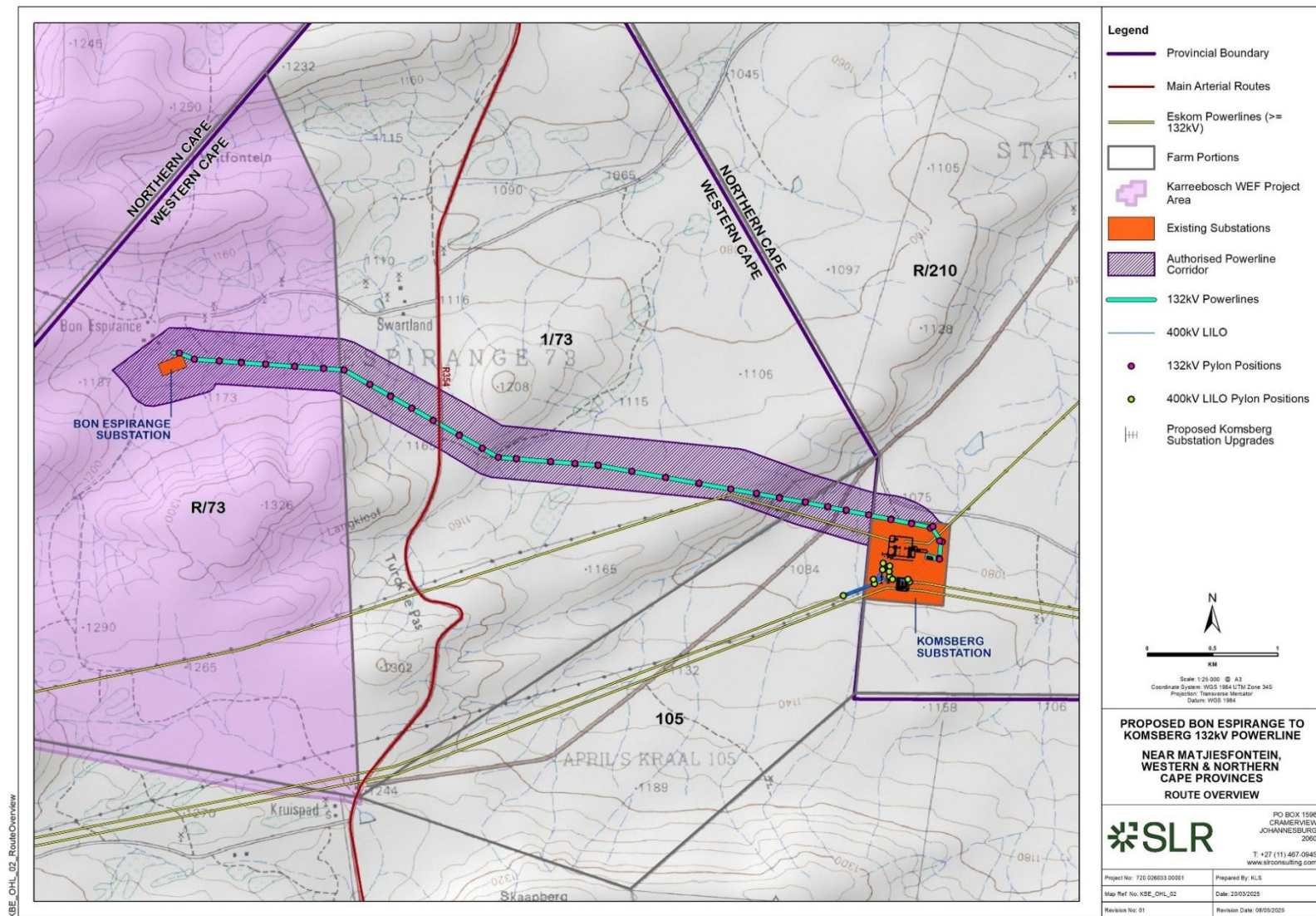


Figure 1.2: Infrastructure map of the proposed OHPL.

2. CURRENT STATUS OF THE PROJECT AREA

2.1. ECOLOGICAL CONTEXT AND IMPORTANCE OF THE SITE

The project area occurs within two national vegetation types; Koedoesberge-Moordenaars Karoo and Central Mountain Shale Renosterveld at the transition zone between the Fynbos Biome and Succulent Karoo Biome. Although neither vegetation type is protected, both are listed as least concern with 99% and 97% of their remaining extent intact (DFFE, 2022).

Habitats within each vegetation type were divided into units based on their location. These included (Figure 3.1):

- Rocky Areas which are flat, rocky slabs comprised of niche habitats that support succulent species,
- Rocky Slopes
- Riparian Areas
- Modified habitat

Although the servitude occurs within areas designated as CBA 2, the proposed powerline follows an existing servitude where disturbance has already occurred. It is unlikely that the assessed powerline will adversely affect the management objectives of the CBA given it has already been disturbed. However, the management requirements for CBAs and ESAs include maintaining these areas as natural/near natural state, reducing the loss of natural habitat, restoring degraded areas, and minimising impacts on ecological processes and ecological infrastructure, especially soil and water.

The specialist did not record any plants species listed on the National Environmental Management: Biodiversity Act (Act No 10. of 2004) (NEM:BA), within the Project Area.

There are several plant species within the development footprint that are protected according to the Northern Cape Nature Conservation Act (Act 9 of 2009). None of these are of conservation concern, but a permit is required from the Provincial authorities to destroy them. The Search and Rescue Plan requires an ecological walkthrough of the project area to identify species that will require permits for their removal and/or destruction, the outcome of which will be to provide a list of protected species.



Figure 2.1: Vegetation map of the project area



Figure 2.2: Sensitivity map of the project area

3. CONSTRAINTS TO SUCCESSFUL REHABILITATION

Ecosystem drivers such as aridity, topographic variation and the underlying substrate within the project area can influence the success of the re-vegetation program. This section provides an outline of risks and constraints associated with successful rehabilitation of disturbed areas located in the project area. Factors that will influence the re-vegetation include:

- Scale of clearing
- Climate seasonality
- Weed and alien plant infestation
- Seed availability
- Soil management
- Landform stability

3.1. SCALE OF CLEARING

The development of the project will result in the clearing of some natural vegetation of which some areas will need to be re-vegetated¹. Given the nature of the development, the areas requiring re-vegetation will be spread out across the site and will be relatively small. Areas requiring re-vegetation will include access roads and temporary laydown areas. Since the areas to be rehabilitated are relatively small, it is recommended that focus is placed on the retention of topsoil (as this includes a viable seedbank), rainfall infiltration, and replanting of species collected during the plant search and rescue. It is further recommended that to ensure ecological stability and minimise erosion, clearing and re-vegetation are done sequentially to minimise the exposure of bare soil to wind and rainfall.

3.2. CLIMATE SEASONALITY

Although the project area occurs within an arid area, rainfall is relatively predictable and strongly seasonal. However, the amount of rainfall may be a limiting factor to the success of rehabilitation efforts. It is therefore recommended that re-vegetation efforts of disturbed areas is done at the start of the rainy season (from late April to early May) to give the plants and seeds the best possible chance of survival. Seeding and planting during the dry summer period must be avoided as species survival rate will be extremely low. However, if this is unavoidable then frequent watering of the seeded area will be required. The re-vegetation schedule must therefore be included in the construction schedule since it is undesirable to have large areas of dry, bare soil exposed to wind during the summer months as these areas will become susceptible to wind erosion and water erosion at the start of the rainy season if not properly managed.

If planting is done during the correct season, risks associated with climate seasonality will be moderate but if done outside of the optimal season they will be high to very high.

¹ This report does not include the decommissioning rehabilitation strategy for the project.

3.3. WEED AND ALIEN PLANT INFESTATION

Although there is a low incidence of weeds and alien invasive plant species within the project area, there are invasive plant species known to occur within the Project Area of Influence (PAOI) that could become established in disturbed areas if not properly managed. Disturbed areas will be at the most risk as they provide the best conditions for these species to establish. As such, it is important to implement the Alien Invasive Plant Management Plan that has been drafted for the project.

Risks of infestation of weeds and Alien Invasive Plant Species are moderate but can be controlled if the Alien Invasive Plant Management Plan is rigorously implemented.

3.4. SEED AVAILABILITY

Given the small size of the areas that will need to be rehabilitated, it is not anticipated that extensive re-seeding will be required. However, if this is necessary, indigenous grass species seeds that naturally occur within the project area must be used. These are commercially available but the risk is that they are often in seed mixes that are not present or dominant in the project area. However, if a combination of re-vegetation methods (i.e. seeding, mulching, planting and returning healthy topsoil to the site) is used to encourage growth of indigenous vegetation, the risks associated with these mixes are low.

3.5. SOIL MANAGEMENT

Topsoil is the most important resource for successful re-vegetation in the project area as this contains a seedbank of naturally occurring species and provides the right conditions for these species to re-establish. As such, topsoil that is cleared must be carefully managed and stockpiled to ensure it does not become degraded. Furthermore, topsoil from high lying areas must be kept separate from topsoil in low lying valleys and floodplains as species composition differs between these areas. This is considered to be a high risk, however if properly managed, this can be reduced to a low risk.

3.6. LANDFORM STABILITY

The topography of the project area ranges from steep slopes to flat areas. Areas that will be more difficult to manage and rehabilitate are along the slopes, particularly those that are steep as these areas will be susceptible to wind and surface water erosion from runoff. To reduce this risk, areas that need to be re-vegetated should be contoured to match the surrounding landscape and compacted areas should be scarified to promote infiltration of water. Furthermore, a thin layer of cleared vegetation debris can be placed over the re-contoured areas and topsoil to reduce surface flow runoff. Holes and trenches dug for infrastructure must be back filled as quickly as possible. The success of re-vegetation efforts within the landscape is anticipated to be a moderate risk.

4. RE-VEGETATION AND HABITAT REHABILITATION PLAN

This section summarises the specific management actions required to successfully re-vegetate the areas within the project footprint that have been impacted on during the construction phase but are no longer required during the operational phase (e.g. temporary laydown areas).

The aim of the Re-vegetation and Habitat Rehabilitation Plan is to ensure that the loss of vegetation and disruption of ecosystem functioning is minimised.

The Re-vegetation and Habitat Rehabilitation Plan has been divided into three phases, each of which is described below.

4.1. PHASE 1: SITE CLEARING AND REMOVAL OF VEGETATION

4.1.1. IDENTIFICATION OF SENSITIVE AREAS

Sensitive areas have been identified in the Terrestrial Biodiversity Impact Assessment Report (Biodiversity Africa, 2025). These areas must be identified and delineated (using painted pegs, danger tape, or other appropriate methods) by the Environmental Site Officer (ESO) prior to vegetation clearing or the commencement of any construction activities. It is important that the construction footprint of the development is kept to a minimum and that no areas outside of the approved footprint are disturbed.

4.1.2. VEGETATION CLEARING

Vegetation clearing should only be done when required and it should be done in phases to retain the vegetation cover for as long as possible and limit the amount of time bare soil is exposed to the elements. Areas outside of the project footprint must remain vegetated.

Prior to clearing, all protected species that occur within the construction footprint and which can be successfully relocated, must be lifted and either transplanted to a newly rehabilitated area or potted and placed in a nursery for future translocation. Individuals of the same species must be planted in clusters rather than scattered singly throughout the rehabilitated area. This will allow for pollination and seed dispersal of these species. Furthermore, species must be transplanted to a similar environment. For instance, species that occur on the ridges and steep slopes must be replanted back into these areas and species that occur in the valleys and drainage lines, must be replanted back into these same areas.

Grass and shrubs that are not translocated but are either uprooted or brush cut, must be collected and stockpiled for re-vegetation purposes. This plant material serves multiple purposes as it is a source of seeds that will assist with the re-vegetation of the sites, it can be used as mulch to protect the

topsoil and improve surface water infiltration, and it is a source of organic matter that is returned to the topsoil. The dumping of cleared vegetation onto areas adjacent to construction areas must be avoided.

During clearing of vegetation, the following principles must be applied:

- Vegetation clearing must remain within the construction footprint and must be cleared in a phased approach, as and when required. Re-vegetation of disturbed areas must therefore be carried out concurrently with construction as far as possible.
- Standing vegetation must not be mixed with soil but must be cleared separately, either mechanically or with a brush-cutter.
- Vegetation that is free of alien invasive plant species must be stockpiled for use as mulch and a source of seeds.
- Mulch should be stored for as short a time as possible to retain seed viability.
- Seeds released from stockpiles should be collected and used for re-vegetation of disturbed areas.

4.2. PHASE 2: SOIL PREPARATION AND TOPSOIL MANAGEMENT

Topsoil is the most important resource for ensuring the success of the re-vegetation of disturbed areas and as such, must be carefully managed to ensure its continued viability and health. As such, the following principles apply to the management of the topsoil:

- Soil must only be stripped from areas that are to be disturbed during construction and not from areas outside of the approved footprint.
- Topsoil must be kept separate from subsoil.
- Where feasible, topsoil must be immediately used in the nursery or to cover previously disturbed areas that require re-vegetation as this will minimise double handling². Where this is not feasible, it must be stockpiled on site for subsequent rehabilitation.
- Topsoil that is stored must be placed in a designated area and stockpiles should not be more than 1.5m high. Topsoil should be used as soon as possible with a maximum limit of four months storage.
- Topsoil piles will likely be susceptible to erosion from wind and water. In the event that some piles become susceptible to erosion, these specific piles should be protected using hessian or similar material. Plastic sheeting must not be used.

Sites that are to be rehabilitated must be prepared prior to re-vegetation. The following steps must be followed:

- The area must be contoured to the natural contours of the landscape.
- All foreign and inorganic material must be removed from the site.

² Topsoil contains viable seed, nutrients and microbes that promote more effective revegetation than soil that has been stored.

- Compacted soil must be ripped to a depth of 600mm to allow for root penetration and aeration of the soil.
- The areas that are to be re-vegetated must be covered with either stockpiled or newly stripped topsoil to the original depth.
- Vehicles must be restricted from travelling over newly prepared areas but must rather use demarcated roads.
- No construction equipment or unauthorised persons should be allowed into recently prepared areas.

4.3. PHASE 3: RE-VEGETATION OF DISTURBED AREAS

A combination of seed sowing, active planting, mulching and topsoil management should be used to restore plant cover to the project area. The final vegetation cover should resemble the original indigenous vegetation composition and structure with a target of achieving 65% of the original species composition.

4.3.1. ACTIVE PLANTING

Active planting of individual species that are protected and therefore need to be translocated (refer to Plant Search and Rescue Plan), should be used as this is a source of mature plants that, if planted correctly, will aid in rehabilitation efforts. Species should be translocated at the start of the rainy season to give them the best chance of survival. Where this is not possible, species should be potted and stored in a nursery until they can be replanted at the start of the following rainy season. Principles that apply to the use of mature plants for re-vegetation efforts include:

- Only individuals from areas that are to be cleared may be harvested. Individuals from outside of the construction footprint must not be harvested.
- Harvesting may only occur once the plant permits have been obtained.
- Individuals must be dug up carefully ensuring the root ball remains intact and stored in a way to prevent the loss of moisture. Plastic bags and plastic boxes are recommended for temporary storage. Plants should not remain in these containers for more than three days.
- Individuals must be planted out into rehabilitated areas immediately or, where this is not feasible, they should be placed into pots and cared for in a nursery until they can be planted out.
- Individuals must be planted out in colonies rather than scattered throughout the site. This will ensure that individuals can cross pollinate and produce viable seeds that can aid in the recolonisation of the disturbed area over time.
- Individuals should be planted out at the start of the rainy season to give them the highest chance of survival.
- Individuals must be planted out in similar habitat to which they were harvested.

4.3.2. SEEDING

The re-application of topsoil and cleared vegetation as mulch is likely to be sufficient for re-vegetation at this site. However, where this is not successful, the ESO can consider collecting indigenous seed from the naturally occurring vegetation and using this to supplement the seedbank present in the topsoil and the seeds from the mulch. If indigenous seeds are collected, the following principles apply:

- Seeds must be collected from areas that are free of alien vegetation.
- Seeds may be collected by hand or harvested using a vacuum harvester. If the latter is used, seeds collected via vacuum harvester must be kept separate from hand collected seed.
- Seeds that are collected must be used immediately or dried and stored appropriately and used at the start of the wet season. Seeds can be dried by laying them out on a sheet in a suitably ventilated room and turned twice a day until they are dry. They should be stored in paper bags in a cool, dry room until required for planting out.
- Seeds should be broadcast onto the site following scarification of the soil surface and watered in to prevent them from blowing away. This will improve germination success rates and seedling survival rates.
- Seeds should be broadcast during the rainy season.
- No seeds from alien invasive plant species or exotic species should be harvested or brought onto the site.

The use of commercial seed mix should be used at the discretion of the ECO and must only be considered where rehabilitation using topsoil, direct planting and seed collected from indigenous species has not worked. If commercial seed mixes are used, then locally occurring grass species should be prioritised. The following principles apply to the use of commercial seed mixes:

- The mix should include a mix of annual and perennial species.
- The mix should include fast growing pioneer species that are not at risk of becoming invasive.
- Selected species must be able to successfully grow in the area where they are planted.
- The mixture used must not cause an ecological imbalance of species in the project area.

4.3.3. MULCHING

Mulching can be used to protect and cover the soil surface as well as provide a source of seed for revegetation purposes. It also adds organic matter back to the soil as it decomposes. The following principles must be applied to mulching:

- Mulch must be made from vegetation that was cleared for construction and which is free of alien invasive plant species.
- Mulch can be put through a wood chipper to break down the plant material.
- Mulch must be applied over the topsoil, after seeding has occurred.

4.3.4. ADDITIONAL GENERAL CONSIDERATIONS

Additional measures that should be considered to ensure the success of the Re-vegetation and Habitat Rehabilitation Plan include:

- In dry areas where seed, moisture and organic matter retention is low, such as within the project site during the dry summer months, soil savers may be considered. Soil savers are loose mats made from biodegradable materials such as hemp and jute that are placed over bare soils and pegged down to prevent wind erosion and soil desiccation. Seeds can be broadcast over soil savers if the holes are large enough to allow for seeds to drop through and/or catch in the material. Fresh mulch can also be applied over the soil savers.
- Erosion control measures may be required to prevent surface water and wind erosion. Low, porous fences that break the wind flow over rehabilitated areas will assist in stabilising newly rehabilitated areas and assist in trapping wind blown dust, organic matter and seeds. They will also create microclimates that aid in the germination of seeds by providing shade and protection from wind.
- If erosion damage occurs after re-vegetation has taken place and forms channels/gullies or wash-aways, backfilling must be done to restore areas to an appropriate condition.
- Areas that need to be backfilled, must be done in a way to ensure that water does not accumulate.
- Subsoil must be used for backfilling and not topsoil. Furthermore, subsoil must not be used to re-vegetate areas.
- The re-instatement of faunal habitats is often overlooked. Faunal microhabitats (e.g. rock stacks and logs) in the construction footprint must be relocated to the same habitat immediately adjacent to the removal site. E.g. Rock stacks should be restacked.
- Temporary infrastructure (laydown areas, widened roads, etc.) must include the provision of microhabitat to attract faunal species to the area by placing logs and rocks at strategic sites to provide shelter for small mammals and reptiles. These rock stacks should mimic the surrounding environment.
- Re-vegetated areas should be fenced off to prevent unauthorised access by vehicles, people, and livestock that could cause trampling, grazing and soil compaction. These fences can be removed once the site has been successfully re-vegetated.

5. MONITORING PLAN

5.1. MONITORING REQUIREMENTS

Monitoring is required to ensure that the recommended management actions are effective and successful, especially in arid environments. Indicators that should be monitored are outlined below and in Table 5.1.

- Fixed point photographs of the re-vegetated sites should be taken at regular intervals to show the progression and success of re-vegetation efforts over time.
- Species composition in the disturbed areas must be recorded and compared to neighbouring control sites to track the success of re-vegetation efforts.
- Vegetation canopy cover must be measured using a consistent and standard method. Since vegetation cover varies with seasonality it is recommended that this is done at the same time each year.
- Presence of alien invasive plant species in disturbed areas must be monitored. If noted, the steps for their removal outlined in the Alien Invasive Management Plan must be implemented.
- Evidence of soil erosion must be monitored. If soil erosion occurs, measures outlined in the erosion management plan/method statement must be implemented.

Monitoring should be carried out every four (4) months for the first year and every six months for the second year and third year or until re-vegetation has been deemed successful. Re-vegetation will be deemed successful once the desired plant cover has been established and there is no evidence of alien invasive plant species or erosion. If re-vegetation methods show poor surface coverage after 12 months (<20%), then the re-vegetation process must be repeated.

Table 5.1: Monitoring Actions, indicators, and timeframes for the implementation of the Re-Vegetation and Habitat Rehabilitation Plan.

| Monitoring Action | Indicator | Timeframe | Responsible |
|---|---|---|-------------|
| Fixed point photographs of the re-vegetated sites. | Evidence showing progression of re-vegetation through increased canopy cover. | Year 1: Every 4 months. Year 2: Every 6 Months Year 3: Every 6 Months | ECO |
| Regular visual inspections of the re-vegetated sites where the following indicators are recorded: <ul style="list-style-type: none"> • Species composition • Canopy Cover • Presence of alien invasive plant species • Evidence of soil erosion | <ul style="list-style-type: none"> • Species composition is comprised 65% of the original composition of the control sites. • Canopy cover is similar to or within 10% variation of the control sites. • No alien invasive plant species are present. • No evidence of erosion. | Year 1: Every 4 months. Year 2: Every 6 Months Year 3: Every 6 Months | ECO |
| Document and review management actions implemented to record the success of the re-vegetation within the project area. | Clear, documented record of management activities and review of success. | Year 1: Every 4 months. Year 2: Every 6 Months Year 3: Every 6 Months | ECO |

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.

5.3. REPORTING

Management measures implemented and success achieved should be clearly documented. Compliance with the Re-vegetation and Habitat Rehabilitation Plan must be documented by the ECO and all reports should 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 should 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 the Re-vegetation and Habitat Rehabilitation 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 Re-vegetation and Habitat Rehabilitation 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 | <p>The Contractor appointed is responsible for implementing the Re-Vegetation and Habitat Rehabilitation Plan during the construction phase of the project.</p> <p>Specific actions for which the contractor is responsible 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">• Implementing this management plan.• Ensuring all personnel comply with the requirements of the plan.• Reporting on the effectiveness of the implementation and monitoring of the re-vegetated sites.• Monitoring the site.• Analysing the data.• Making recommendations on remedial action when required.• Writing progress and annual reports. |
| 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">• Identifying and demarcating sensitive areas.• Inspecting the re-vegetated areas and reporting on these findings throughout the construction phase to the developer and environmental authorities.• Keeping a photographic record of the re-vegetation progress.• Reviewing and approving construction method statements related to re-vegetation of the site. |

| | |
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| | <ul style="list-style-type: none"> • Reviewing and inspecting Contractor's written records that illustrate compliance with the Environmental Management Plan (EMPr). • Recommending and/or developing corrective actions when there is non-compliance or when the measures to re-vegetate the disturbed area is not working. • The ECO must sign off on when the re-vegetated areas have successfully reached a state where no further monitoring and interventions are required. |
|--|--|

7. CONCLUDING REMARKS

The project area is currently comprised of relatively intact vegetation. Re-vegetation of disturbed areas is costly and as such, keeping the development footprint to a minimum will reduce the costs associated with re-vegetation and subsequent monitoring of the project area.

Since several protected species occur within the construction footprint and will need to be translocated (refer to the Plant Search and Rescue Plan) to a new receiving environment, it is recommended that these species are used for the re-vegetation of disturbed areas.

The applicant, contractor and ECO will need to ensure that the Re-vegetation and Habitat Rehabilitation Management Plan are reviewed periodically for efficacy and necessary revisions made to the document where applicable.

8. REFERENCES

Biodiversity Africa. 2025. Proposed Kuduskop Wind Energy Facility Access Road and Construction Camp Basic Assessment Between Matjiesfontein and Sutherland in the Northern Cape Province. Cape Town, South Africa.

Coetzee, K. 2016. Practical Techniques for Habitat and Wildlife Management. New Voices Publishing Services, Cape Town. ISBN: 978-0-620-70843-2.

Government of South Africa (2022) South African Red List of Terrestrial Ecosystems: assessment details and ecosystem descriptions. Government Notice 2747, Gazette 4526. Technical Report #7664, SANBI Pretoria, South Africa.

Hoare, D.B. 2021. Revegetation Management Plan for the proposed Oya Energy Facility between Sutherland and Matjiesfontein in the Western and Northern Cape Provinces. Consulting report.

Hoare, D. 2019. Ecological Impact Assessment study on the potential impacts of the proposed Rondekop 325MW Wind Energy Facility between Matjiesfontein and Sutherland in the Northern Cape Province. Prepared for SiVEST SA (Pty) Ltd on behalf of Rondekop Wind Far (Pty) Ltd.

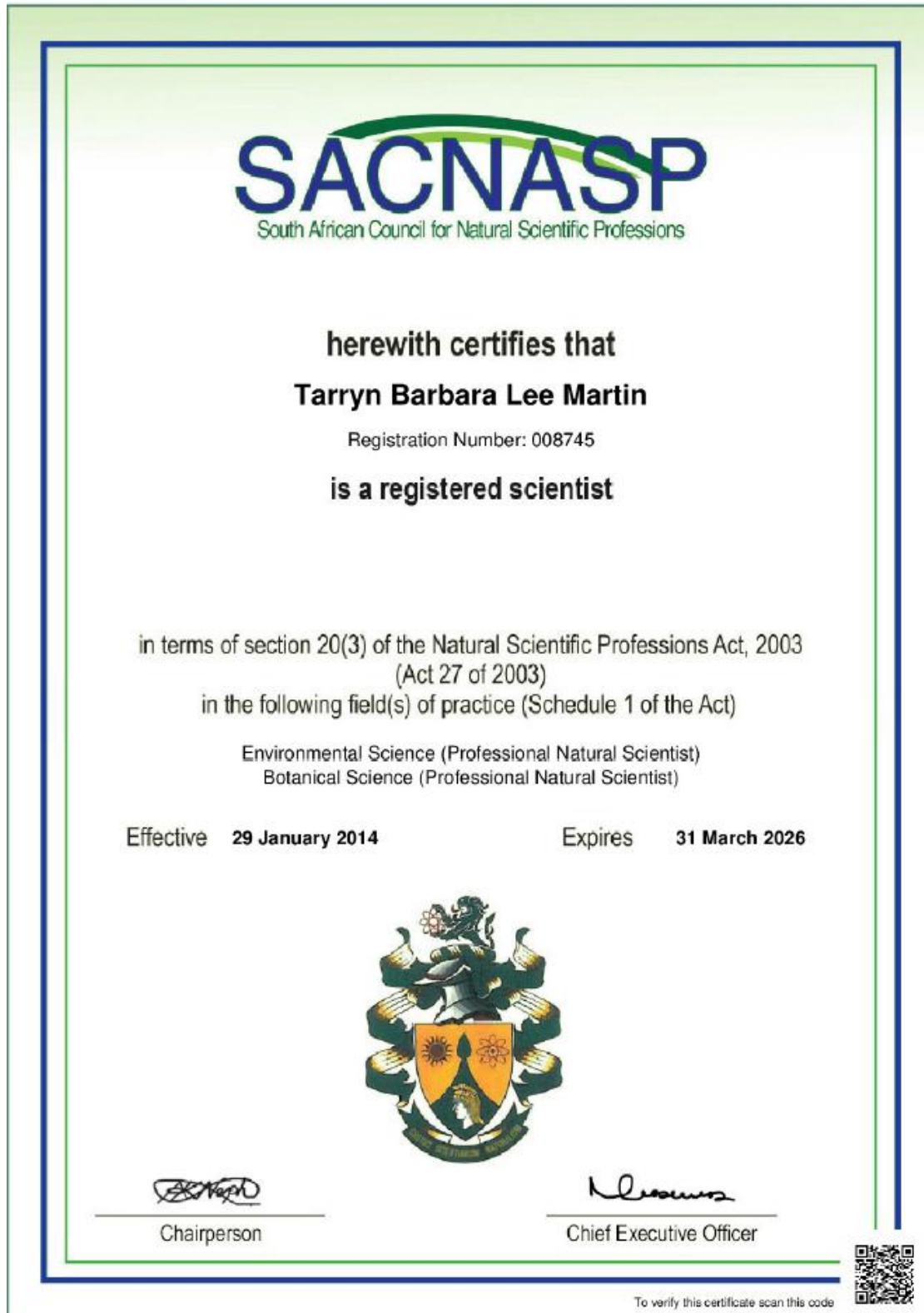
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Pool-Stanvliet, R., Duffell-Canham, A., Pence, G. & Smart, R. 2017. The Western Cape Biodiversity Spatial Plan Handbook. Stellenbosch: CapeNature.

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

Ms Tarryn Martin (Botanical Specialist) (Pri. Sci. Nat. 008745) – Role: Lead Author and Site Assessment





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

APPENDIX 2: CV

Ms Tarryn Martin

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

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 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).

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 C₃ and C₄ 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 C₄ 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 C₃ and C₄ subspecies of *Alloteropsis semialata*. *Journal of Ecology*. 98 (5): 1196 - 1203. 2010
- South African Association of Botanists (SAAB) conference, Grahamstown. Title: Responses of C₃ and C₄ 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 C₃ and C₄ (NADP-ME) grasses to fire. January 2008

COURSES

- Rhodes University and CES, Grahamstown
- EIA Short Course 2012

CONSULTING EXPERIENCE

- 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

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 biodiversity 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: Innwind 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.

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- 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.