

Plant Rescue and Protection Plan, Inyanda-
Roodeplaat Wind Energy Facility, Eastern Cape,
South Africa



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For

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LD Biodiversity Consulting

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Appointment of Specialist

Leigh-Ann de Wet (LD Biodiversity Consulting) was commissioned by SRK to develop a plant rescue and protection plan. This report thus serves as an addendum to the original Ecological Impact Assessment conducted by CES in 2014, and the Ecological Impact Assessment Update Report completed by LD Biodiversity Consulting in 2016.

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Expertise of the specialist

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- Registered Professional Natural Scientist with the South African Council for Natural Scientific Professionals (Ecological Science).
- Registered with RSPO as a certified High Conservation Value Assessor (Plants), since 2011.
- Founded LD Biodiversity Consulting in 2014.
- Ecological Consultant since 2009.
- Conducted, or have been involved in over 100 Ecological Impact Assessments, Baseline surveys, Biodiversity Action Plans and Offset Plans throughout Africa.
- Published four scientific papers, two popular articles and have three scientific papers in preparation.
- Presented 7 international conference presentations, and at two Botanical Society meetings.
- Lectured methods for specialist assessment for the Rhodes University short course on EIA.

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1 Introduction

1.1 Objective of this Plan

The objectives of this plan are as follows:

- To ensure adequate conservation of important species;
- Reduce the impact of the Inyanda-Roodeplaat WEF on the conservation important plant species associated with the WEF; and
- Provide a manageable plan in order to adhere to legal requirements and try to meet no net loss targets for individual species numbers.

This plan is part of an adaptive management process and must be updated regularly based on new information. A general rescue and protection plan is provided here. However, it is recommended that species-specific approaches be developed once a comprehensive list of Species of Special Concern (SSC) is drawn up for the footprint of the site (as is required as part of the permitting process for their removal).

Currently there are three options for power line construction for connection to the national grid. This plan can be applied as far as possible to the power line associated with the WEF, however, as soon as the power line design is finalized. The Plant Rescue and Protection Plan should be updated.

1.2 Vegetation of the Inyanda-Roodeplaat WEF

Nine different vegetation types were described from the study area; these are summarized in Table 1.1, with an indication of the general vegetation shown in Figure 1-1. A vegetation map is shown in Figure 1-2. A detailed description of the vegetation of the site can be found in the Ecological Impact Assessment Report. The vegetation of the Inyanda-Roodeplaat WEF is sensitive, with several conservation important species. The sensitivity map (Figure 1-2) indicates which areas of the study site are sensitive.

Table 1.1: Summary of the vegetation types mapped for the Inyanda-Roodeplaat WEF study area.

Vegetation type	Brief description
Thicket	Found on rocky outcrops within the fynbos, thicket comprises typical thicket species including <i>Euclea undulata</i> , <i>Pappea capensis</i> , <i>Brachylaena illicifolia</i> etc.
Proteaceous fynbos	Occurs on steep south and east facing slopes. Dominated sometimes almost exclusively of <i>Leucodendron salignum</i> but other species may include <i>Protea munii</i> and <i>Metalasia muricata</i> . This fynbos type includes the Shale fynbos delineated by CES (Zide & Lubke 2014).
Grassy fynbos	On gentle to steep slopes with rocky outcrops containing thicket elements. Dominated by grass species including <i>Eragrostis curvula</i> , <i>Themeda triandra</i> , <i>Cymbopogon plurinodis</i> and <i>Tristachya rehmannii</i> . Other species include geophytes from the Iridaceae family including <i>Bobartia orientalis</i> and Proteacea species including <i>Protea mundii</i> , <i>Leucodendron salignum</i> and <i>Protea nerifolia</i> .
Succulent thicket	Succulent thicket occurs on flat areas to the east of the site and is comprised of an almost completely succulent suite of species dominated by <i>Portulacaria afra</i> and other Crassulaceae and Mesembryanthemaceae species.
Karoo	Karoo is restricted to the very north of the site where it occurs on both sides of the road. A low succulent shrub interspersed with Euphorbia species characterizes it. This vegetation type is fairly degraded within the study site.
Degraded thicket	Degraded thicket occurs near the main farmhouse and in areas that have been grazed by livestock or have been used as agricultural land previously. The thicket is open and characterized by typical thicket species that exhibit a browsing growth-form (a clear-cut umbrella tree shape) and include <i>Pappea capensis</i> and <i>Euclea undulata</i> as dominant species. This vegetation type contains the majority of the alien invasive species recorded from the site.
Renosterveld	Renosterveld is restricted to a small section of the site and is clearly delineated by the presence of Renosterbos (<i>Elytropappus rhinocerotis</i>) where it occasionally forms a monoculture.
Acacia riparian thicket	The primary riparian vegetation type on the site has a road running through it and as such, is degraded. The vegetation type is dominated by <i>Acacia karroo</i> although in some areas species such as <i>Salix mucronata</i> , <i>Schotia afra</i> and <i>Dondonea angustifolia</i> are found.



Figure 1-1: General vegetation on the upper slopes of the Inyanda WEF study site.

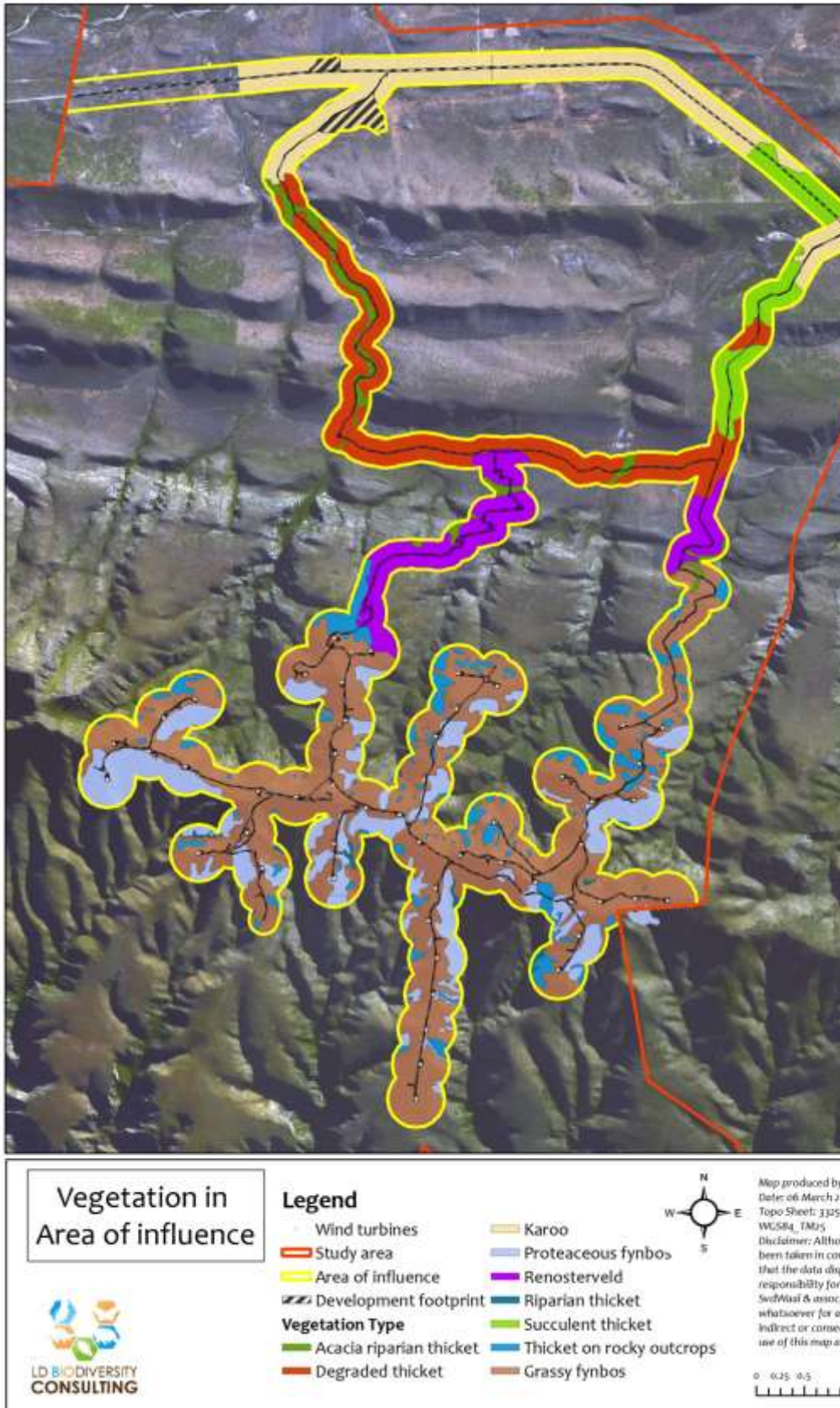


Figure 1-2: Vegetation map of the Inyanda-Roodeplaar WEF.

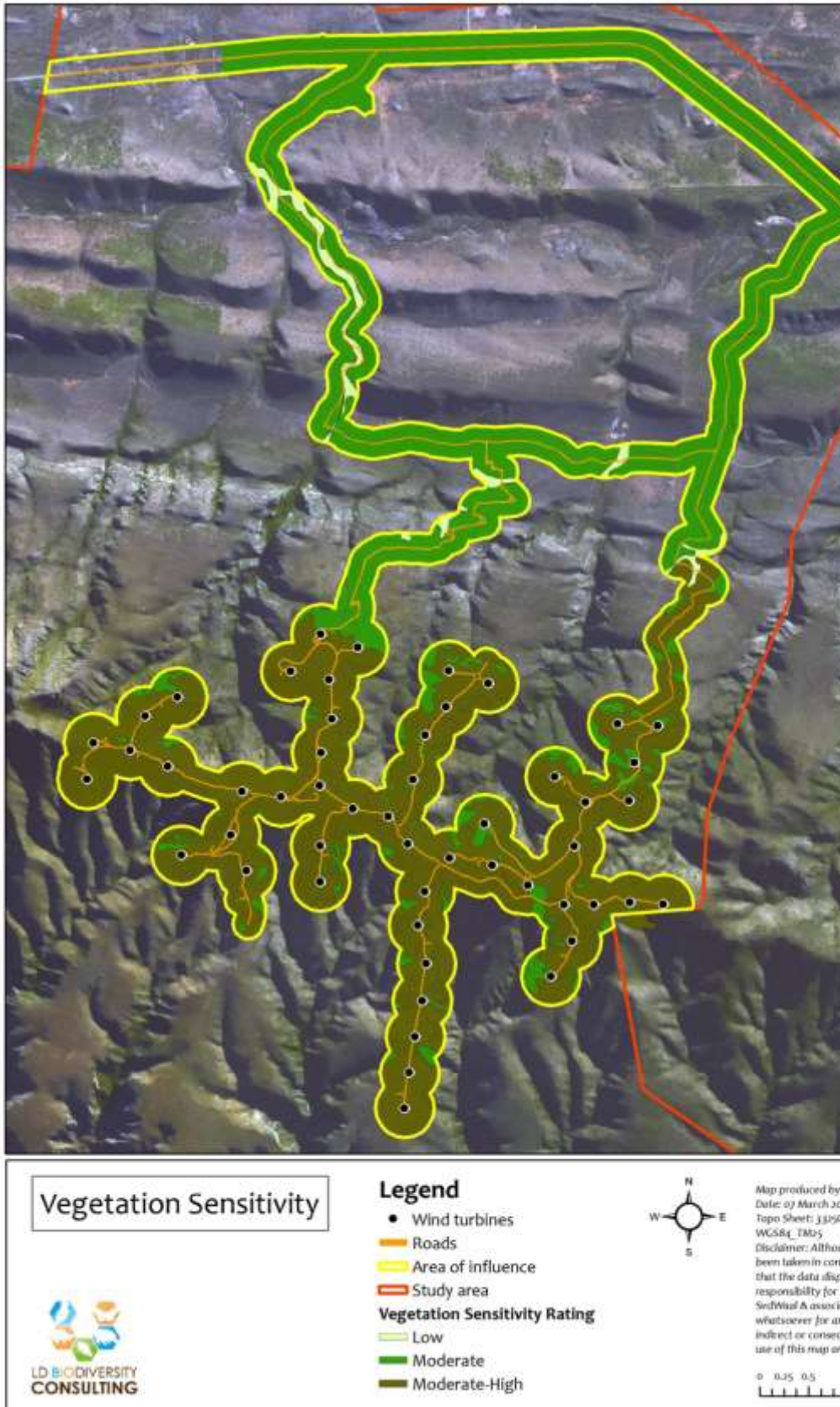


Figure 1-3: Sensitivity of the Inyanda-Roodeplaat WEF

1.3 Vegetation of the Inyanda-Roodeplaat Power line options

All three power line options go through the same vegetation types, both in Mucina & Rutherford (2006) and STEP (Figure 1-4). These vegetation types are shown in Table 1.2. Of the different options, option 2 traverses the largest area of alluvial vegetation. The vegetation of the Roodeplaat WEF is sensitive, with several conservation important species. The sensitivity map (Figure 1-5) indicates which areas of the study site are sensitive according to STEP.

Table 1.2: Vegetation types of the three power line options (adapted from Zide and Lubke (2014)).

Mucina & Rutherford	Description	STEP	Description
Sundays Thicket	Characterised by undulating plains and low mountains and foothills covered with tall dense thicket. The Sundays Thicket is composed of a mosaic of predominantly spinescent species that include trees, shrubs and succulents. It is classified as Least Threatened with a conservation target of 19%. 6% has been transformed by cultivation and urban development.	Sundays Spekboomveld	This vegetation type is dominated by <i>Pappea capensis</i> and <i>Portulacaria afra</i> while <i>Euphorbia coerulescens</i> and <i>Crassula ovata</i> are abundant succulent plants that characterize this vegetation type. This spekboomveld is distinguished from adjacent noorsveld by the relatively high cover of <i>Portulacaria afra</i> , <i>Pappea capensis</i> and <i>Schotia afra</i> . This vegetation type is listed as Endangered.
		Sundays Spekboom Thicket	The tree component of this vegetation type is dominated by <i>Portulacaria afra</i> and <i>Pappea capensis</i> . Other common species include <i>Euphorbia ledienii</i> and <i>Rhigozum obovatum</i> . This vegetation type is listed as Vulnerable.

Mucina & Rutherford	Description	STEP	Description
Albany Alluvial	Thornveld and riverine thicket are the two major vegetation types that occur in this vegetation type. It is classified as Endangered with a conservation target of 31%. Only 6% has been statutorily conserved.	Sundays Doringveld	Sundays Doringveld is characterised by a mosaic of thicket clumps and a Nama-karoo matrix. Thicket clumps often have low species diversity with species that are typical of the Sundays Valley Thicket. Dominant species in the Nama-karoo matrix comprise of <i>Acacia karoo</i> , <i>Lycium sp.</i> And <i>Cynodon dactylon</i> and include a suite of succulents, some of which are rare endemics such as <i>Haworthia sordida</i> . This vegetation type is listed as Vulnerable..
Sundays Noorsveld	The Sundays Noorsveld occurs along flat lowlands. It is characterised by succulent thicket consisting of a mosaic of <i>Euphorbia caerulescens</i> and low karoo shrub vegetation (dominated by <i>Pentzia incana</i> and <i>Rhigozum obovatum</i>). This vegetation type is classified as Least Threatened with a conservation target of 19%. About 15% is statutorily conserved in the Greater Addo Elephant National Park and some 3% in private game ranches. Approximately 4% of this vegetation type has been transformed by cultivation.	Sundays Noorsveld	The dominant species of this vegetation type is <i>Euphorbia caerulescens</i> . Presence of witgat trees (<i>Boscia oleoides</i>) and wildegranaat (<i>Rhigozum obovatum</i>) is diagnostic. Spekboom (<i>Portulacaria afra</i>), only found in the better-preserved veld, was never a dominant component. Palatable grasses (<i>Cenchrus ciliata</i> , <i>Fingerhuthia africana</i> and <i>Panicum maximum</i>) used to be abundant, but are now sparse.

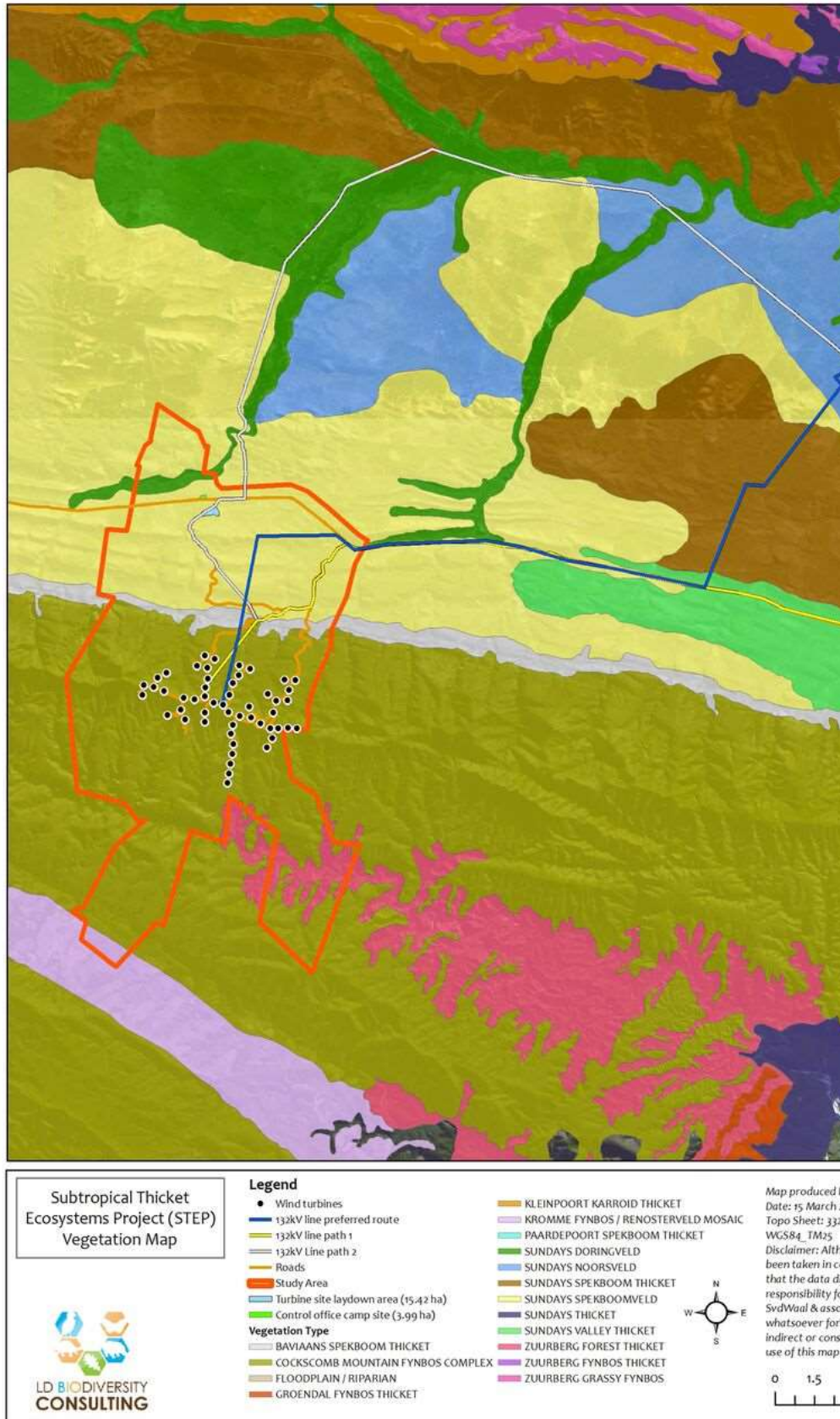


Figure 1-4: STEP vegetation map of the power line alternatives



Figure 1-5: STEP Conservation status map indicating the areas traversed by the power line options associated with the Inyanda-Roodeplaat WEF.

2 Permitting

Several lists exist for the Species of Special Concern (SSC) that have been and may be recorded from the footprint of the study site. Plants on these lists require a permit for their destruction or removal. The following lists require permits:

- “The **National Forests Act of 1998** protected tree species may not be cut, disturbed, damaged, destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold – except under license granted by the Department of Water Affairs and Forestry (or a delegated authority). Applications for such activities should be made to the responsible official in each province. Each application is evaluated on merit (including site visits) before a decision is taken whether or not to issue a license (with or without conditions). Such decisions must be in line with national policy and guidelines.” (DAFF 2016)
- “The **National Environmental Management: Biodiversity Act** (No. 10 of 2004), (NEMBA) was signed into law in mid-2004 and entered into effect on 1 September, 2004. The Act provides for the consolidation of biodiversity legislation through establishing national norms and standards for the management of biodiversity across all sectors and by different management authorities. Certain activities, known as Restricted Activities are regulated on listed species using permits by a special set of regulations published under the Act. Restricted activities regulated under the act are keeping, moving, having in possession, importing and exporting, and selling.” (EWT & SANBI 2015)
- The **Provincial Conservation Ordinance** (No. 19 of 1974) states: “Subject to the provisions of this ordinance, no person shall without a permit, be in possession of, sell, buy, donate, receive as a donation, pick, or import into, export from or transport in or through the province any endangered flora.” Permits are required for the destruction, growth and planting of these species.

The generally accepted permit application includes a list of the plants that fall under each piece of legislation; some with GPS coordinates (as in the case for Protected Trees). A permit application must then be done and the relevant authority may require a site visit before issuing a permit. Permits are required by law before any SSC are removed, cleared, or transplanted.

A ground-truthing site visit is required prior to construction to identify and locate a comprehensive list of SSC within the footprint of the development to be used in the permit application process.

3 Species of Special Concern

SSC that have been recorded from the site are shown in Table 3.1 as per Zide and Lubke (2014). It should be noted that a ground-truthing site visit would produce a comprehensive list of SSC for the entire site, which is required for the permitting process for the removal, or destruction of such species. Such a comprehensive ground-truthing study was not part of the scope of this assessment.

Blanket protected families and genera (PNCO) occurring on site include all *Aloe* species, all *Amaryllidaceae* species, all *Encephalartos* species, all Ericaceae, all Iridaceae, all *Haworthia* species, all Mesembryanthemaceae species, all Proteaceae species. The site is rich with many of these groups, all of which will require permits to remove or destroy.

Table 3.1: SSC recorded from the study site (Zide & Lubke 2014).

Scientific name	IUCN	SA Red data list	CITES appendix	NEMBA protection status	PNCO Schedule
<i>Agathosma gonaquensis</i>		CR			
<i>Encephalartos longifolius</i>	NT	NT	II	Protected	3
<i>Kniphofia triangularis</i>		R			
<i>Loxostylis alata</i>		D			
<i>Pelargonium reniforme</i>		NT			
<i>Aloe ferox</i>			II		3
<i>Bobartia orientalis</i>					4
<i>Carpobrotus edulis</i>					4
<i>Diascia capsularis</i>					4
<i>Erica cerinthoides</i>					4
<i>Erica cf chamissonis</i>					4
<i>Erica cf copiosa</i>					4
<i>Erica imbricate</i>					4
<i>Geissorhiza heterostyla</i>					4
<i>Kniphofia triangularis</i>					4
<i>Lampranthus spectabilis</i>					4
<i>Leucadendron salignum</i>					4
<i>Leucospermum cuneiforme</i>					4
<i>Protea foliosa</i>					4
<i>Protea lanuginosa subs. Intermedia</i>					4
<i>Protea mundii</i>					4
<i>Protea nerifolia</i>					4
<i>Protea nitida</i>					4

4 Plant Rescue and Protection Plan

The site comprises three spatial zones:

- The footprint of the study area
- The Area of Influence, which is the area most likely to receive the majority of the impacts of the development and
- The Study Area, comprising the farms containing the development.

The areas that are likely to be directly impacted by the development need to be cleared, any Species of Special Concern (SSC) in these areas require a permit for destruction or removal. Some of these plants are difficult to transplant and the most practical measure would be to collect seeds and then destroy them. Other plants however are relatively easy to remove and propagate. These plants will need to be collected from the Footprint of the study site, and transplanted into pots that will be housed in a nursery onsite. These plants can then be used in rehabilitation of the site. Figure 4-1 indicates a portion of the footprint of the site that will need to be included in the search and rescue.

This plan provides the management and monitoring for plant rescue and protection at the Inyanda-Roodeplaat WEF site. It should be noted that propagation of these plants could result in an increase in the number of individuals of each of the SSC, thus having an overall positive impact on the numbers of these species.

Prior to construction, a ground-truthing site visit must be conducted in order to draw up a full list of SSC. These then need to be included in the permit application before removal or transplanting of any of these species. This plan is general; a species-specific approach should be developed as part of adaptive management once a comprehensive list of SSC is drawn up for the site as part of the permit application process.

The Plant Rescue and Protection Plan follows; these tables are designed to be freestanding (with reference to the maps) and to be utilized in the field by the responsible parties.

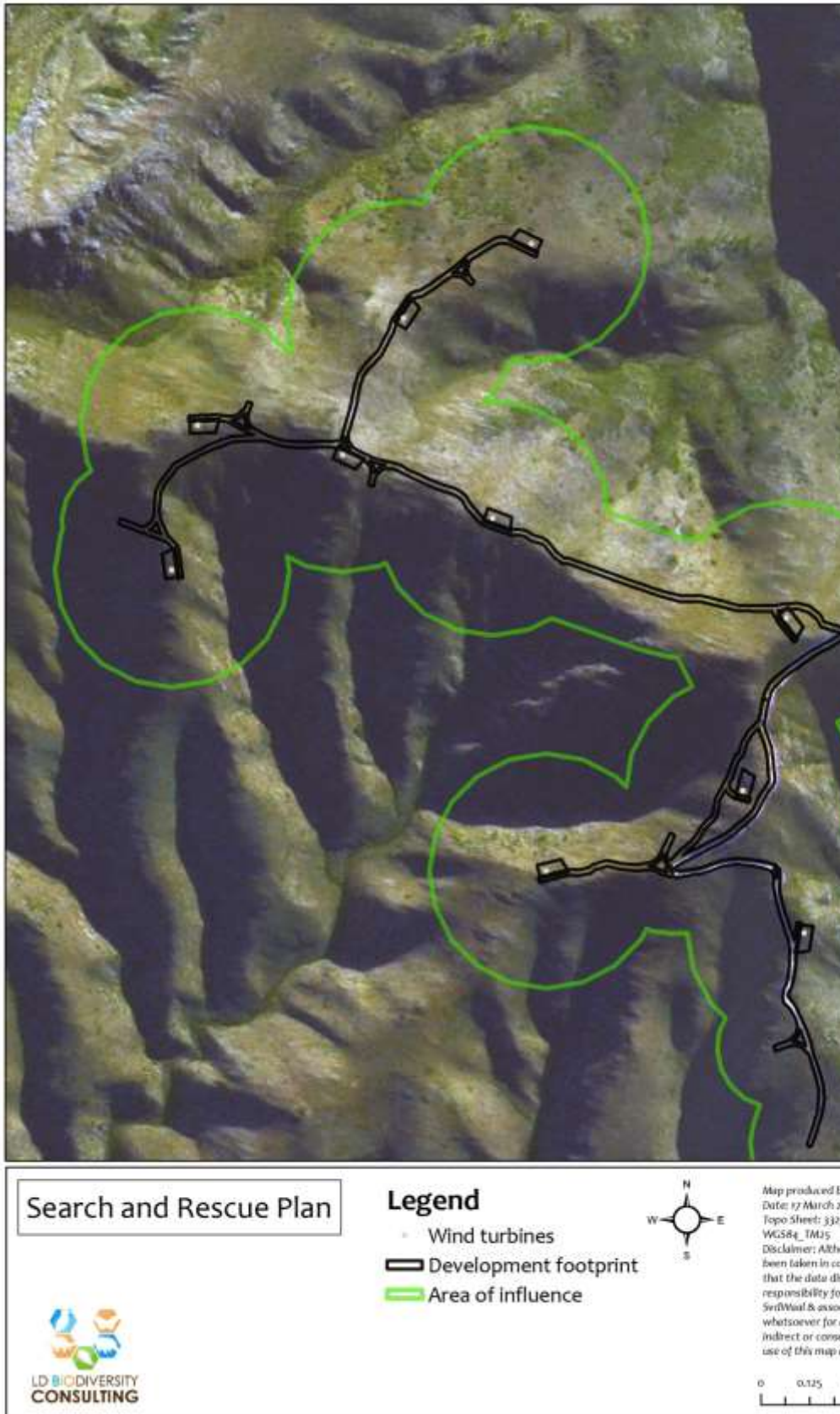


Figure 4-1: Example of areas to be surveyed for search and rescue.

Inyanda-Roodeplaat WEF Plant Rescue and Protection Plan			
1: Construction Phase			
Number	Task	Responsible Party	Frequency
1.1	A site visit that covers the entire footprint of the development and records all Species of Special Concern (SSC), population sizes and locations. This must occur during the peak flowering season, and may require more than one site visit, depending on specialist recommendations. A list, corresponding to the law governing the permitting should be produced as well as a map.	Botanical Specialist	Once, preconstruction
1.2	Locations of all species that fall under the list of Protected Trees (following the site assessment) should be particularly noted. These species should be avoided wherever possible, and recommendations made to change the design to do so wherever practicable.	Botanical Specialist	Once, preconstruction

1.3	Application and acquisition of permits required for clearing of SSC.	Botanical Specialist	Once, preconstruction
1.4	Establishment of a nursery to house rescued plants that will be used for rehabilitation of the site. The nursery must be impenetrable to herbivores to avoid loss of species. The nursery will house potted plants for transport and should be located in an area with easy access.	Botanical Specialist	Once, preconstruction
1.5	Removal of fynbos SSC (including, but not limited to Proteaceae and Ericaceae) should include the following: 1.5.1) Collection of viable seed from plants to be destroyed as well as from nearby individuals to be used in propagation trials and to aid rehabilitation 1.5.2) An initial pilot study should be conducted on the possibility of transplanting these species to be used for rehabilitation later	Botanical Specialist	Once, preconstruction for the footprint and continually (season permitting) for other areas)
1.6	Removal of thicket SSC (primarily succulents) should	Botanical specialist	Once, preconstruction

	<p>include the following:</p> <p>1.6.1) Digging up each plant with roots intact as far as possible, which are then placed in a moist clear plastic bag;</p> <p>1.6.2) Transplanting of each plant into a suitable sized bag or pot with a succulent mix (alien free) to be kept in a nursery for rehabilitation of the site</p>		<p>for the footprint and continually (season permitting) for other areas)</p>
1.7	<p>Removal of geophytic SSC (bulb, including Iridaceae) must include:</p> <p>1.7.1) Removal of the bulb and intact root system as far as possible and then kept in moistened clear plastic bags until they can be replanted;</p> <p>1.7.2) Any leaves should be trimmed to 1/3 of their length;</p> <p>1.7.3) Bulbs should then be planted into bags and housed in the nursery until required for rehabilitation</p>	Botanical specialist	<p>Once, preconstruction for the footprint and continually (season permitting) for other areas)</p>
1.8	<p>Removal of any <i>Portulacaria afra</i> (a plant, though not protected, that is well-suited</p>	Botanical specialist	<p>Once, preconstruction for the footprint</p>

	to thicket rehabilitation and propagation) should include the following: 1.8.1) Plants should be cut up into truncheons approximately 30cm long and kept in moistened clear plastic bags; 1.8.2) Truncheons can then be planted directly into bags and housed in the nursery		and continually (season permitting) for other areas)
1.9	All clearing must be monitored to ensure that all SSC are rescued	Botanical Specialist	As construction progresses.
1.10	Any changes to plans must be reviewed for the presence of SSC and their rescue if required	Botanical Specialist	When necessary
1.11	Staff should be trained in conservation goals, including the prohibition of collection of medicinal plants.	Botanical Specialist	When necessary
1.12	Site access must be strictly controlled with sign in required on entering.	Contractor	Daily
1.13	Signage should indicate the prohibition of collecting indigenous species	Contractor	Once
2: Operational Phase			

Number	Task	Responsible Party	Frequency
2.1	Site access must be strictly controlled with sign in required on entering.	Gate control	Daily
2.2	Signage should indicate the prohibition of collecting indigenous species	Contractor	Once
2.3	Collecting of plants should be strictly prohibited on site unless required and under the supervision of the ECO.	ECO	When necessary
2.4	Management of the nursery and propagation trials	Botanical Specialist	Daily
2.5	Integration of the nursery plants into the Rehabilitation Plan	Botanical Specialist	Daily

5 References

DAFF (2016). Forestry Regulation & Oversight.

<http://www.daff.gov.za/daffweb3/Branches/Forestry-Natural-Resources-Management/Forestry-Regulation-Oversight/Sustainable-Forestry/Protected-Trees>

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