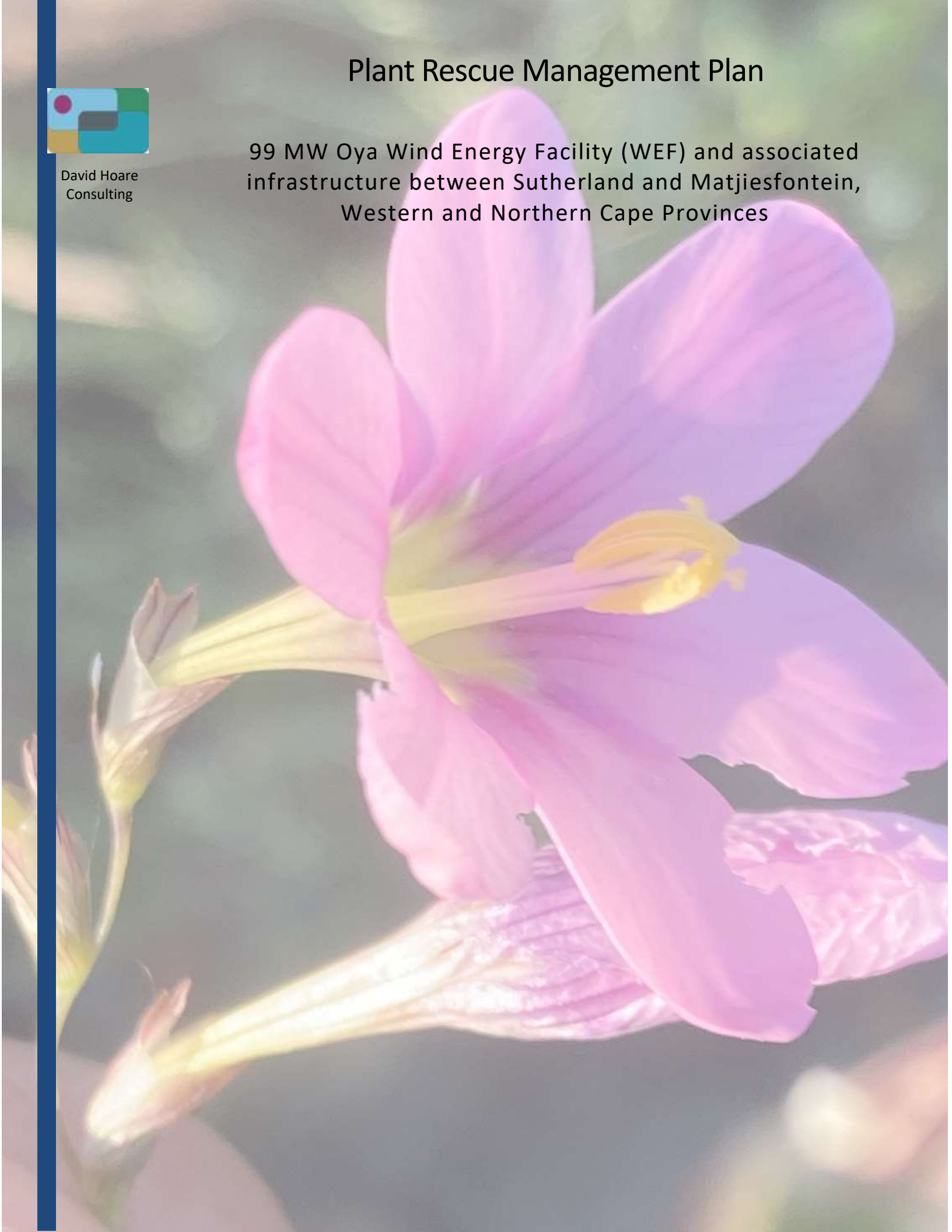


Plant Rescue Management Plan



David Hoare
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99 MW Oya Wind Energy Facility (WEF) and associated
infrastructure between Sutherland and Matjiesfontein,
Western and Northern Cape Provinces





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Plant Rescue Management Plan for the proposed 99 MW Oya Wind Energy Facility between Sutherland and Matjiesfontein in the Western and Northern Cape Provinces.

Location:
Witzenberg Local Municipality within the Cape Winelands District
Municipality

Prepared for

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1. INTRODUCTION

1.1 Background

This document provides a management plan for the rescue of listed plants for the project area under the control of the 99 MW Oya Wind Energy Facility (WEF) and associated infrastructure (Figure 1). This site-specific management plan was developed to address the requirement to rescue any plants that could reasonably be expected to survive transplanting from the path of proposed construction. Currently, the site is in a mostly natural state, but this will be altered during the course of the development of the project, at which time various locations will be cleared of natural

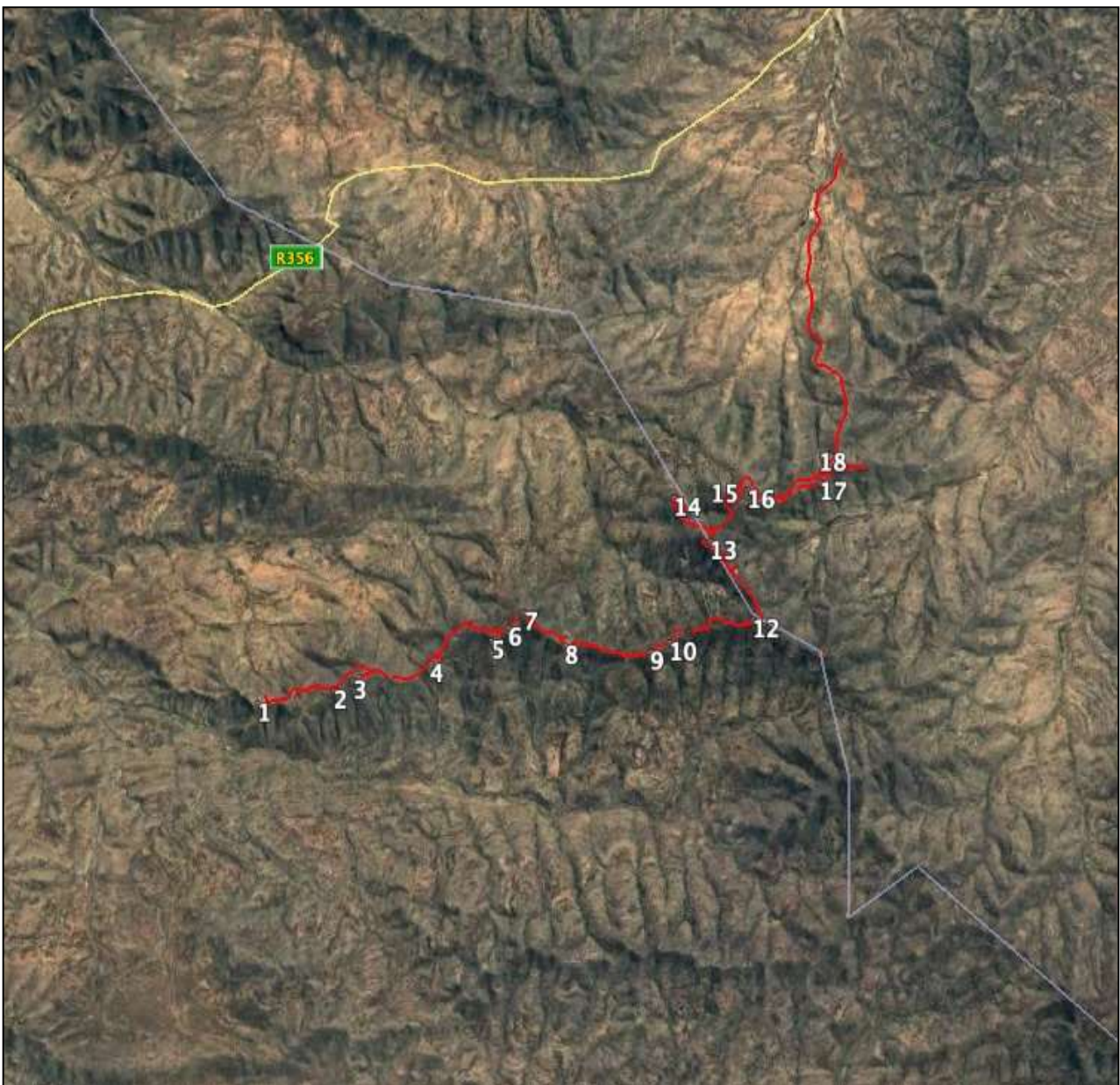


Figure 1: Location and extent of the study area.

habitat in preparation for construction of components of the authorised project. Where possible, it is desirable to undertake rescue of suitable plant material.

1.2 Purpose of the Plant Rescue Plan

The purpose of the Plant Rescue Plan is:

- to provide practical guidance on search and rescue of threatened or protected plant species (TOPS), as well as any other plants that can be used in the rehabilitation process.

The objective is to identify, remove and, where possible, rescue or relocate species of concern and other species, as discussed. The area to which this Plan refers is the footprint areas of the project within the study area (Figure 1).

1.3 Responsible persons

Rescue of sensitive plant species during the construction phase of the project will be dependent on a number of project personnel. These are listed below:

The Developer

This refers to the project proponent, Oya Energy (Pty) Ltd. It will be responsible for the following:

1. Ensure that the requirements set out in this Plan are adhered to and implemented;
2. Allocate the responsibilities assigned to the Environmental Control Officer (ECO) to an independent suitably qualified individual prior to the start of construction activities on site; and
3. Provide all principal contractors working on the project with a copy of this management plan as part of tender contract documentation to allow the contractors to cost for its requirements within their respective construction contracts or alternatively, commission a suitable service provider to undertake the required Search and Rescue independent from any contract documentation with individual contractors.

The Project Environmental Manager

The Project Environmental Manager of the proposed development will be responsible for the overall implementation of the Plan during the construction phase of the project. To effectively implement the plant rescue plan, the Project Environmental Manager must be aware of the findings, mitigation measures and conclusions of the Final EIA report, the requirements of the EA, the EMPr, and this Plan.

The Environmental Control Officer (ECO)

The ECO is responsible for monitoring and verifying the implementation of the Plan during the construction phase of the project. To effectively implement the Plan, the ECO must be aware of the findings, mitigation measures and conclusions of the Final EIA Report, the EA, and this Plan.

The Contractor

The contractor, being any directly appointed company or individual undertaking the implementation of works, may be responsible for complying with the Plan at all times during the construction phase. Alternatively, an independent Nursery Contractor/Horticulturalist may be appointed to undertake the Search and Rescue. If such a contractor is appointed, they require competency in horticulture, and possibly landscaping.

1.4 Legal Requirements

- National Environmental Management: Biodiversity Act (Act 10 of 2004), including Threatened or Protected Species Regulations;
- National Environmental Management Act (Act 107 of 1998);
- Cape Nature and Environmental Conservation Ordinance 19 of 197
- Northern Cape Nature Conservation Act No. 9 of 2009

2. ECOLOGICAL PRINCIPLES FOR PLANT RESCUE

Plant rescue is considered to be a last resort to conserve individual plants, when authorization for development has been obtained and construction is imminent. The ecosystem within the footprint of the development, with all its species diversity, genetic variation and ecological interrelationships will be lost and the objective is to salvage something prior to the destruction. Some considerations are as follows:

1. Plant rescue can usually only salvage a small proportion of the plants on site. This is due to two main factors, firstly, the fact that different species appear at different times and some species will almost certainly be dormant at the time that the Search and Rescue is undertaken, and secondly, there may be practical limitations in terms of how much plant material can be salvaged.
2. Globally, it has been recognised that the selection of plants to rescue is based on criteria that may have little to do with conservation, for example, ease of access, horticultural value and probability of survival.
3. Plants chosen for rescue may not thrive or even survive. It is highly unlikely that all rescued plants will survive. This is based on the fact that it is virtually impossible to predict without experimentation and research exactly what artificial conditions will be required for the management of each species in order to ensure survival.
4. Various agencies globally (e.g IUCN) and nationally (e.g. SANBI) have expressed concern regarding the concept of plant rescue. The concern is that the implementation of a plant Search and Rescue can weaken support for habitat conservation by fostering the perception that rescuing selected plants can compensate for destruction of an entire habitat, or that landscape plantings can substitute for natural areas.
5. Plant rescue can divert time, energy, resources and leadership from tasks that may be more effective in protecting natural habitats.
6. Plants can be used for rehabilitation of affected areas, thereby restoring something resembling the natural vegetation.
7. It can also make a long-term contribution to public education by providing native plants for public gardens and nature centers.

2.1 Principles

- *In situ* conservation is preferable to *ex situ* conservation. Removing a population from its natural habitat and placing it under artificial conditions results in the erosion of the inherent genetic diversity and characteristics of that species. This principle is very strongly emphasized on the SANBI websites "Guidelines for Environmental Impact Assessments" (www.redlist.sanbi.org/eiaguidelines.php) where the following is stated:

"In situ conservation is vital and should be recommended as the only option for conserving species of conservation concern. Ex situ conservation, i.e. the removal of a subpopulation from its natural habitat to an artificial environment, a practice often termed 'search and rescue', will result in the erosion of the inherent genetic diversity and characteristics of that species and increase its extinction risk in the wild. Similarly, translocation of subpopulations is an unacceptable conservation measure."

- In order to ensure the persistence of a population, it is imperative that the ecological processes maintaining that population persist. This requires that natural habitats are maintained in an ecologically functional condition.
- Translocation of Red List species is an unacceptable conservation measure since the translocated species may have undesirable ecological effects, as follows:
 - Alterations to habitat by translocated species may be harmful to other species,
 - Translocations may lead to transmission of pathogens or parasites (Hodder & Bullock, 1997).
 - Translocation may result in rapid changes in the species itself (Conant, 1988).
 - Translocations are expensive and rarely successful (Griffith et al., 1989).
 - Success entails not only survival of the translocated individuals but also establishment of a self-sustaining, viable population able to reproduce and adapt to changing environmental conditions (Milton et al., 1999).
 - Relocation of rescued plants to undisturbed habitats falsifies the local history of natural dispersal and alters the natural species composition of the target site.

Once again, this has been emphasized on the SANBI websites "Guidelines for Environmental Impact Assessments" (www.redlist.sanbi.org/eiaguidelines.php) where the following is stated:

"Translocations are expensive and rarely successful. Even if they are successful, translocated individuals may harm other species within the receiving environment, the translocated individuals may transmit pathogens and/or parasites, and translocation may result in rapid changes in the species itself."

"Search and Rescue" as a conservation ideal therefore contradicts principles espoused by the South African National Biodiversity Institute (SANBI) and IUCN.

The implications of these principles are as follows:

- It is highly preferable not to replant rescued plants into other natural habitats. Based on scientific evidence and concerns expressed by SANBI, translocation to an existing conservation area cannot be supported as a management measure.
- Rescued plants, if re-planted back in the wild, should be placed as close as possible to where they were originally removed. However, as stated in the previous paragraph, re-planting into natural areas is not supported as a management measure.
- Re-planting into the wild must cause as little disturbance and harm as possible to existing natural ecosystems. As stated in the previous paragraph, re-planting into natural areas is not supported as a management measure.
- Rescue must be limited to only those areas where plants will be destroyed by the development. No plants should be removed from areas that will otherwise not be disturbed.
- Rescue should not be undertaken from any site where there is a significant risk that well-established invasive alien plants or other pests will be spread by the relocation of native plants.
- The solution would be for rescued plants to only be replanted into disturbed areas after construction for rehabilitation purposes.

2.2 Planning considerations

The following factors affect planning of plant rescue:

- Adequate time must be allowed to obtain the necessary information about the site and its flora. This is usually achieved during the EIA stage and follow-up surveys. A detailed walk-through survey has already been undertaken for the current project. A reliable inventory of the plants found on a site is a key factor in determining whether a rescue is appropriate and, if it is, how the plants will be used. In general, a rescue should not be undertaken if an appropriate use of the rescued plants is not ready at hand or easily found. Where invasive alien species are present, which is not the case here, the numbers and concentrations must be known. If there are large concentrations of alien invasive species, this may rule out any rescue and limits the choice of relocation sites or eventual use of the rescued plants.
- There must be adequately qualified and equipped personnel to undertake a plant rescue. Personnel undertaking the rescue should have the knowledge and skills to ensure that the rescue operation is a success. A trained and qualified botanist is required to identify the species to be rescued, but horticultural skills are required for nursery establishment and for the actual planning and management of a nursery.
- In principle, rescued plants should be utilized for public benefit, not private gain. Acceptable uses are therefore replanting in rehabilitated areas, providing stock for propagation and providing plant material for a scientific project. Problematic uses are selling rescued plants to the public and providing plants for private gardens. This is because additional permits would be required for transport and trade of protected species. An incentive is also created to remove plants from the wild, which is not supported.
- Rescuing plants that are listed as protected under National or Provincial legislation is subject to requirements that cover the collection and use of whole plants, their progeny and plant parts, including seeds. A permit is required to possess, transport or propagate such species. The general permit for removal of TOPS will cover these components. Any trader would be required to get their own permits.
- A priority for replanting is to maintain the ecological integrity of the target habitat. Appropriate target sites include a managed wildflower garden, such as a botanical garden, and an interpretative nature trail. Botanical gardens offer programs to help visitors identify and learn about native plants and can make it clear that plants have been rescued, not wild collected, especially for those species that are not commercially available. Inappropriate target sites are natural habitats in which ecological integrity is currently uncompromised.

Identified limitations in meeting RoD requirements

Based on the limitations provided above, it is proposed that the following activities should be undertaken to address the conditions that can be met:

1. All TOPS that can be located within the footprint of the development zone, as identified by a botanist, should be rescued. This includes suitable tree seedlings and understory plants inside the servitude in the forest areas. A rescue operation should be undertaken by the horticultural contractor / plant rescue team to remove as many of these as possible.
2. Temporary nurseries should be established in close proximity to the construction areas, as far as possible, and should be located in non-sensitive areas.
3. An invitation should be sent to CREW¹ to remove any plants within the footprint of the development zone prior to construction. Whether or not they respond positively to this or not will be based on policies and

¹ The Custodians of Rare and Endangered Wildflowers (CREW) programme involves volunteers from the public in the monitoring and conservation of South Africa's threatened plants. The programme is a partnership between SANBI and the Botanical Society of South Africa (BotSoc).

discussions which they will need to develop internally, but it is important to maintain communications with them in this regard.

4. Topsoil removed from the footprint of the construction path should be carefully managed to ensure that propagules within the soil mass also have an opportunity to survive. This will include any geophytes or plants with underground parts that will grow after soil translocation.
5. Stockpiled soil should be used for rehabilitation and any plants within the soil that have survived should become established.
6. Rescued plants within temporary nurseries that are appropriate to transplant into rehabilitated areas should be planted out during rehabilitation.
7. Remaining plants not used in rehabilitation should be kept in temporary nurseries for a limited period of time. Thereafter, these remaining plants should be handed over to new custodians, which may include public and educational institutions.
8. No translocation to other natural areas should take place.

3. SPECIES OF CONSERVATION CONCERN THAT OCCUR ON SITE

This section provides an outline of the existing status of the study area with respect to the occurrence of any species of conservation concern or any other plant species that are deemed worthy of rescue prior to construction. The purpose is to provide an indication of the identity of such species.

3.1 Protected plants (National Environmental Management: Biodiversity Act)

Only one plant species protected under the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) could potentially occur on site, namely *Hoodia gordonii*. There are no other plant species protected according to this legislation that have a geographical distribution that includes the study area. The walk-down survey did not encounter any individuals of this species. There are therefore no species for which permits will be required under the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004).

3.2 Protected plants (Cape Nature and Environmental Conservation Ordinance 19 of 1974)

Plant species protected under the Cape Nature and Environmental Conservation Ordinance 19 of 1974 are listed in Appendix 2. There are two Schedules under this Ordinance, the first (Schedule 3) being Endangered species and the second (Schedule 4) Protected species. None of the species in the first Schedule (Schedule 3: Endangered species) have a geographical distribution that includes the site. They therefore do not occur there.

A number of species protected according to Schedule 4 were found on site. From the field surveys of the site, this includes the following species:

- *Antimima hallii* (AIZOACEAE)
- *Antimima pumila* (AIZOACEAE)
- *Astroloba bullulata* (ASPHODELACEAE)
- *Babiana cuneata* (IRIDACEAE)
- *Babiana spathacea* (IRIDACEAE)
- *Brunsvigia comptonii* (AMARYLLIDACEAE)
- *Cephalophyllum* sp. (AIZOACEAE)
- *Cheiridopsis namaquensis* (AIZOACEAE)
- *Crassula columnaris* subsp. *columnaris* (CRASSULACEAE)
- *Delosperma* sp. (AIZOACEAE)
- *Drosantherum* sp. (AIZOACEAE)
- *Gladiolus splendens* (IRIDACEAE)

- *Hammeria gracilis* (AIZOACEAE)
- *Hammeria meleagris* (AIZOACEAE)
- *Lampranthus* sp. (AIZOACEAE)
- *Leipoldtia schultzei* (AIZOACEAE)
- *Mesembryanthemum guerichianum* (AIZOACEAE)
- *Mesembryanthemum junceum* (AIZOACEAE)
- *Mesembryanthemum nitidum* (AIZOACEAE)
- *Mesembryanthemum noctiflorum* (AIZOACEAE)
- *Mesembryanthemum tortuosum* (AIZOACEAE)
- *Microloma sagittatum* (APOCYNACEAE)
- *Moraea cuspidata* (IRIDACEAE)
- *Moraea flaccida* (IRIDACEAE)
- *Moraea pritzeliana* (IRIDACEAE)
- *Moraea tripetala* (IRIDACEAE)
- *Pectinaria articulata* (APOCYNACEAE)
- *Psilocaulon junceum* (AIZOACEAE)
- *Quaqua mammillaris* (APOCYNACEAE)
- *Ruschia intricata* (AIZOACEAE)
- *Ruschia multiflora* (AIZOACEAE)
- *Veltheimia capensis* (HYACINTHACEAE)

3.3 Protected plants (Northern Cape Nature Conservation Act No. 9 of 2009)

A number of flora species protected according to Schedule 2 of the Northern Cape Nature Conservation Act No. 9 of 2009 were found on site. From the field surveys of the site, this includes all the species listed for the Western Cape Province (above), as well as the following species:

- *Adromischus liebenbergii* (CRASSULACEAE)
- *Albuca tenuifolia* (ASPHODOLACEAE)
- *Aloe microstigma* (ASPHODOLACEAE)
- *Crassula cotyledonis* (CRASSULACEAE)
- *Crassula deltoidea* (CRASSULACEAE)
- *Crassula dependens* (CRASSULACEAE)
- *Crassula subaphylla* (CRASSULACEAE)
- *Drimia physodes* (HYACINTHACEAE)
- *Euphorbia mauritanica* (EUPHORBIACEAE)
- *Euphorbia multiceps* (EUPHORBIACEAE)
- *Lachenalia comptonii* (HYACINTHACEAE)
- *Pelargonium abrotanifolium* (Pelargonium spp.)
- *Pelargonium crithmifolium* (Pelargonium spp.)

- *Pelargonium luteopetalum* (Pelargonium spp.)
- *Pelargonium moniliforme* (Pelargonium spp.)

4. PLANT RESCUE PLAN

This section provides details on the actions that are required to rescue any TOPS and/or listed plant species from the path of development and what steps are to be taken to house them temporarily and then to place them back into suitable habitats.

4.1 Plant rescue activities required

Before construction commences at the site, the following actions must be taken:

Action	Responsible person
<p><u>Collate information on potential species of concern</u></p> <p><i>Initial identification of all listed species that may occur within the project area. This is covered in this report and other survey reports related to this project. The action is therefore complete.</i></p>	Botanist
<p><u>Mark footprint of proposed construction area</u></p> <p><i>The footprint of proposed development must be marked out prior to breaking ground. (It is assumed that this will follow a phased approach and that not all areas will be marked simultaneously. An example would be pegging out the route of a section of road to be constructed prior to earth-moving equipment beginning work on construction but could also include provision of a GPS track or GIS polygon file that depicts the affected areas.)</i></p>	Contractor / Engineer / Developer
<p><u>Species search and rescue</u></p> <p><i>Location and rescue of all plants to be rescued that may occur within marked out areas (within the footprint of proposed infrastructure). The marked-out area must be walked and required species rescued.</i></p>	Botanist
<p><u>Plant marking and information requirements</u></p> <p><i>For all plants that are rescued, relevant information should be collected, as is determined by the horticulturalist as being adequate for reporting and monitoring. This information could include the number of individuals/clumps and date collected, as well as where they came from.</i></p>	Qualified botanist / horticulturalist
<p><u>Establishment of nurseries</u></p> <ul style="list-style-type: none"> <i>Nursery facilities must be established within either the proposed site office area or in a construction laydown area or in any other suitable site where</i> 	

<p><i>additional natural habitat will not be affected and where there is access to water.</i></p> <ul style="list-style-type: none"> • <i>Permits to collect, relocate and propagate plant material and to collect seed or cuttings for the contract must be obtained from the relevant authorities. This should be a single permit application that covers all components of the project.</i> • <i>The landscaping contractor must provide a comprehensive method statement relating to the nursery locality, layout, structures, operations and security. The method statement must also cover all aspects of operation, including sources of water and growing medium and a description of the intended practices to be used. The intended use of all horticultural practices should be described, as well as the intended use of additives such as polymer gels and resins. The proposed practices must be suited to the list of rescued species and should take specialized growing requirements into consideration.</i> • <i>The nursery must include a storage area. The nursery and storage area must be of adequate capacity to provide an amount of material stored (of whatever sort required for the completion of the works) sufficient to ensure that no interruption to the progress of the work is occasioned by lack of seeds, plants and other materials. The facility must also be cool and dry and rodent free.</i> • <i>The horticulturist / landscaping contractor must inspect all plant materials weekly to locate any diseased or insect pest infestations or weeds. If any are identified, appropriate control measures must be applied.</i> 	
<p><u>Plant rescue</u></p> <ul style="list-style-type: none"> • <i>Appoint an experienced horticulturalist or landscaping contractor to undertake the rescue operation, manage the rescued plant material and operate the nursery.</i> • <i>From information gathered during the process of marking plants, establish the resource requirements for the plant rescue team workforce and the methodology to be employed to maximize the likelihood of success.</i> • <i>A multipronged approach to plant rescue should be followed to maximize the likelihood of success. This should take into account overall genetic variability and alternatives to preserving genetic variability. In addition to transplanting of whole plants, seed can be collected to sow in situ in suitable habitats. For plants that can be successfully grown in a nursery environment, seed and other propagules (cuttings, wildlings) must be propagated to supplement the plant rescue effort.</i> • <i>Habitats that are currently disturbed/transformed and that are outside the development footprint are possible sites for rehabilitation where a positive biodiversity outcome can be locally achieved.</i> • <i>Rescued plants must be planted into a container to be housed within a temporary nursery on site or immediately planted into the target habitat.</i> 	

<p><i>If planted into natural habitat, it must be protected from construction activities and monitored to ensure survival.</i></p> <ul style="list-style-type: none"> • <i>Where appropriate, it may be possible to directly transplant individuals from areas about to be cleared backwards to areas that are already undergoing rehabilitation.</i> 	
<p><u>Control of impacts on adjacent areas</u></p> <ul style="list-style-type: none"> • <i>Any listed plants close to the development servitude that will remain in place may not be defaced, disturbed, destroyed or removed. They should be cordoned off with construction tape or similar barrier and marked as no-go areas.</i> • <i>The collecting of plants by unauthorized persons should be prevented.</i> • <i>ECO to monitor that vegetation clearing only happens once all search and rescue operations have been completed.</i> • <i>The ECO should monitor construction activities in sensitive habitats to ensure that impacts within these areas are kept to a minimum.</i> 	<p>ECO / qualified botanist</p>

5. MONITORING REQUIREMENTS

The following monitoring activities are recommended as part of the plant rescue plan:

- Post-relocation monitoring of plants relocated during search and rescue to evaluate whether the intervention was successful or not. This should be undertaken on an annual basis over a period of three years in order to evaluate the success thereof.
- Provision of a detailed record, including photographs, that indicates the success of the plant rescue operation.

5.1 Indicators and Targets

Indicator	Target
Written and photographic records from all all search and rescue operations.	All species of conservation concern identified or removed prior to clearing.
Survival rate of translocated plants	50-80% (based on probable survival rate of grassland species)

6. CONCLUSIONS

This Control Plan is an initial assessment and should be modified as control methods are activated and conditions related to invasion change on site. This requires continuous input and monitoring, including periodic collection of field data in order to analyse the status of the site and the effectiveness of management interventions, notably in terms of improving habitat condition of priority management units. This Control Plan should feed into / be adapted to a broader biodiversity strategy for the Oya WEF project.

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10. APPENDICES:

Appendix 1: Plant species of conservation importance that were assessed as having a high probability of being found in the study area.

Taxon	Latest (IUCN version 3.1) Conservation Status**	Habitat	Flowering Time	Probability of occurrence*
<i>Lotononis venosa</i> FABACEAE	Vulnerable	Few known locations. Some of the habitat has been transformed for crop cultivation in the past. Further agricultural expansion and overgrazing by livestock are potential threats. Klein Roggeveld Mountains. Central Mountain Shale Renosterveld, Koedoesberge-Moordenaars Karoo. Open karroid scrub on sandy clay alluvium.	September	HIGH , vegetation type and habitat suitable.
<i>Octopoma nanum</i> / <i>octojuge</i> / <i>quadrisepalum</i> AIZOACEAE	Vulnerable	A localized habitat specialist with fewer than 10 known locations and declining due to overgrazing by livestock and game. Tanqua Karoo, Western Little Karoo, Koedoesberge-Moordenaars Karoo, Matjiesfontein Quartzite Fynbos, Tanqua Wash Riviere, Flats and gentle slopes with loamy soils and sparse quartz gravel. Previously recorded in grid as well as a number of surrounding grids that include Roggeveld plateaux, Moordenaars karoo and Cape mountains.	November	HIGH , Found on flats and gentle slopes with loamy soils and sparse quartz grave
<i>Ehrharta eburnea</i> POACEAE	Near Threatened	Calvinia, Sutherland and Montagu. Rocky places in mountain renosterveld.	September- November	HIGH , habitat and distribution matches
<i>Geissorhiza karooica</i> IRIDACEAE	Near Threatened	Roggeveld Mountains to Matjiesfontein. Succulent karoo shrubland on coarse shale slopes.	August- September	HIGH , previously recorded on nearby site
<i>Lachenalia whitehillensis</i> HYACINTHACEAE	Near Threatened	Southern Roggeveld Escarpment near Sutherland to Matjiesfontein in the southern Great Karoo. Sandy soils in riverbeds and on alluvial plains, sometimes in damp places among rocks in river beds.	October	HIGH , recorded on nearby project
<i>Senecio erysimoides</i> ASTERACEAE	Data Deficient – Taxonomically problematic	Unknown, but recorded on three occasions in similar landscapes (Roggeberg foothills) to the north of the site.	December- April	HIGH , habitat matches

* Conservation Status Category assessment according to IUCN Ver. 3.1 (IUCN, 2001), as evaluated by the Threatened Species Programme of the South African National Biodiversity Institute in Pretoria. *IUCN (3.1) Categories: VU = Vulnerable, EN = Endangered, CR = Critically Endangered, NT = Near Threatened.

Appendix 2: Flora protected under the Cape Nature and Environmental Conservation Ordinance 19 of 1974

SCHEDULE 3: Endangered Flora

As per the Cape Nature and Environmental Conservation Ordinance 19 of 1974

Family: APOCYNACEAE	Common name / Additional notes
<i>Pachypodium namaquanum</i>	Halfmens (currently listed as LC)
Family: GESNERIACEAE	
<i>Charadrophila capensis</i>	Cape Gloxinia (currently listed as Rare)
Family: LILIACEAE	
<i>Aloe pillansii</i>	Now called <i>Aloidendron pillansii</i> , currently listed as Endangered
<i>Aloe buhrii</i>	Currently listed as Vulnerable
<i>Aloe erinacea</i>	Now called <i>Aloe melanacantha</i> , currently listed as Least Concern
Family: PROTEACEAE	
<i>Mimetes capitulates</i>	Currently listed as Endangered
<i>Mimetes hottentoticus</i>	Currently listed as Critically Endangered
<i>Mimetes stokoei</i>	Currently listed as Critically Endangered
<i>Orothamnus zeyheri</i>	Currently listed as Vulnerable
<i>Protea odorata</i>	Currently listed as Critically Endangered
Family: STANGERIACEAE	
<i>Stangeria eriopus</i>	Bobbejaankos (currently listed as Vulnerable)
Family: ZAMIACEAE	
<i>Encephalartos</i> spp.	Cycads, all species

SCHEDULE 4: PROTECTED SPECIES

As per the Cape Nature and Environmental Conservation Ordinance 19 of 1974

Family: AMARYLLIDACEAE	All species
Family: APOCYNACEAE	All species except those listed in Schedule 3
Family: AQUIFOLIACEAE	All species
<i>Ilex mitis</i>	
Family: ARACEAE	
<i>Zantedeschia elliottiana</i>	Yellow arum lily (currently DDT)
Family: ASCLEPIADACEAE (now Apocynaceae)	All species
Family: BORAGINACEAE	
<i>Echiostachys spicatus</i>	
Family: BRUNIACEAE	All species
Family: COMPOSITAE (now Asteraceae)	
<i>Senecio colyphyllous (coleophyllous?)</i>	
<i>Cotula duckitteae</i>	
Family: CRASSULACEAE	
<i>Crassula columnaris</i>	
<i>Crassula perfoliata</i>	
<i>Crassula pyramidalis</i>	
<i>Kalanchoe thyrsiflora</i>	
<i>Rochea coccinea (now Crassula cochinea)</i>	
Family: CUNONIACEAE	
<i>Cunonia capensis</i>	
<i>Platylophus trifoliatus</i>	

Family: DIOSCOREACEAE	
<i>Testudinaria sylvatica</i> (now <i>Dioscorea sylvatica</i>)	
<i>Testudinaria elephantipes</i> (now <i>Dioscorea elephantipes</i>)	
Family: ERICACEAE	All species
Family: EUPHORBIACEAE	
<i>Euphorbia bupleurifolia</i>	
<i>Euphorbia fasciculata</i>	
<i>Euphorbia globosa</i>	
<i>Euphorbia horrida</i>	
<i>Euphorbia meloformis</i>	
<i>Euphorbia obesa</i>	
<i>Euphorbia schoenlandii</i>	
<i>Euphorbia symmetrica</i>	
<i>Euphorbia valida</i>	
Family: GEISSELOM(AT)ACEAE	All species
Family: GESNERIACEAE	
<i>Streptocarpus</i>	All species
Family: GRAMINAE (now Poaceae)	
<i>Arundinaria tessellata</i> (<i>Thamnocalamus tessellatus</i>)	
<i>Secale africanum</i> (now <i>Secale strictum</i> subsp. <i>africanum</i>)	
Family: GRUBBIACEAE	All species
Family: IRIDACEAE	All species
Family: LEGUMINOSAE (now Fabaceae)	
<i>Erythrina acanthocarpa</i>	
<i>Erythrina humeana</i>	
<i>Liparia comantha</i>	
<i>Liparia sphaerica</i>	
<i>Liparia splendens</i>	
<i>Podalyria calyptata</i>	
<i>Priestleya vestita</i>	
<i>Priestleya tomentosa</i>	
Family: LILIACEAE (now split into a number of families)	
All species of the genus ALOE except those specified in Schedule 3 and the species <i>Aloe ferox</i>	
<i>Gasteria beckeri</i>	
<i>Gloriosa superba</i>	
All species of the genus <i>Haworthia</i>	
All species of the genus <i>Kniphofia</i>	
All species of the genus <i>Lachenalia</i>	
<i>Littonia modesta</i>	
<i>Sandersonia aurantiaca</i>	
All species of the genus <i>Veltheimia</i>	
<i>Agapanthus walshii</i>	
<i>Daubenya aurea</i>	
Family: MELIACEAE	
<i>Nymania capensis</i>	
Family: MESEMBRYANTHEMACEAE (now Aizoaceae)	All species
Family: MUSACEAE (now Strelitziaceae)	
<i>Strelitzia</i>	All species
Family: NYMPHAEACEAE	
<i>Nymphaea capensis</i> (now <i>N. nouchali</i>)	
Family: ORCHIDACEAE	All species
Family: OXALIDACEAE	
<i>Oxalis nutans</i> (no such species)	

Family: PENAEACEAE	All species
Family: POLYGALACEAE	
<i>Muraltia minuta</i>	
Family: POLYPODIACEAE	
<i>Adiantum (now Family Pteridaceae)</i>	All species
<i>Hemitelia capensis (now Alsophila capensis, Family Cyathaceae)</i>	
<i>Polystichum adiantiforme (now Rumohra adiantiformis, Family Dryopteridaceae)</i>	
Family: PORTULACACEAE	
<i>Anacampseros (now Family Anacampserotaceae)</i>	All species
Family: PROTEACEAE	
<i>All species</i>	
Family: RANUNCULACEAE	
<i>Anemone capensis (now A. tenuifolia)</i>	
Family: RESTIONACEAE	
<i>Chondropetalum</i>	
<i>Acockii pillans (no such species)</i>	
<i>Elegia fenestrata</i>	
<i>Restio acockii</i>	
<i>Restio micans</i>	
<i>Restio sabulosus</i>	
Family: RETZIACEAE (now Stilbaceae)	
<i>Retzia capensis</i>	
Family: RHAMNACEAE	
<i>Phylica pubescens</i>	
Family: RORIDULACEAE	All species
Family: RUTACEAE	All species
Family: SCROPHULARIACEAE	
<i>Diascia</i>	All species
<i>Harveya</i>	All species
<i>Nemesia strumosa</i>	
<i>Halleria</i>	All species
Family: THYMELAEACEAE	
<i>Lachnaea aurea</i>	

Appendix 3: Flora protected under the Northern Cape Nature Conservation Act No. 9 of 2009.

SCHEDULE 1: SPECIALLY PROTECTED SPECIES

As per the Northern Cape Nature Conservation Act, No. 9 of 2009, Schedule 1

Family: AMARYLLIDACEAE	
<i>Clivia mirabilis</i>	Oorlofskloof bush lily / <i>Clivia</i>
<i>Haemanthus graniticus</i>	April fool
<i>Hessea pusilla</i>	
<i>Strumaria bidentata</i>	
<i>Strumaria perryae</i>	
Family: ANACARDIACEAE	
<i>Ozoroa</i> spp.	All species
Family: APIACEAE	
<i>Centella tridentata</i>	
<i>Chamarea snijmaniae</i>	
Family: APOCYNACEAE	
<i>Hoodia gordonii</i>	
<i>Pachypodium namaquanum</i>	Elephant's trunk
Family: ASPHODOLACEAE	
<i>Aloe buhrii</i>	
<i>Aloe dichotoma</i>	
<i>Aloe dichotoma</i> var. <i>rumosissima</i>	Maiden quiver tree
<i>Aloe dabenorisana</i>	
<i>Aloe erinacea</i>	
<i>Aloe meyeri</i>	
<i>Aloe pearsonii</i>	
<i>Aloe pillansii</i>	
<i>Trachyandra prolifera</i>	
Family: ASTERACEAE	
<i>Athanasia adenantha</i>	
<i>Athanasia spathulata</i>	
<i>Cotula filifolia</i>	
<i>Euryops mirus</i>	
<i>Euryops rosulatus</i>	
<i>Euryops virgatus</i>	
<i>Felicia diffusa</i> subsp. <i>khamiesbergensis</i>	
<i>Othonna armiana</i>	
Family: CRASSULACEAE	
<i>Tylecodon torulosus</i>	
Family: DIOSCORACEAE	
<i>Dioscorea</i> spp.	Elephant's foot, all species
Family: ERIOSPERMACEAE	
<i>Eriospermum erinum</i>	
<i>Eriospermum glaciale</i>	
Family: FABACEAE	
<i>Amphithalea obtusiloba</i>	
<i>Lotononis acutiflora</i>	
<i>Lotononis polycephala</i>	
<i>Lessertia</i> spp.	
<i>Sceletium toruosum</i>	
<i>Sutherlandia</i> spp.	Cancer Bush, all species

Wiborgia fusca subsp. macrocarpa	
Family: GERANIACEAE	
Pelargonium spp.	Pelargonium, all species
Family: HYACINTHACEAE	
Drimia nana	
Ornithogalum bicornutum	
Ornithogalum inclusum	
Family: IRIDACEAE	
Babiana framesii	
Ferraria kamiesbergensis	
Freesia marginata	
Geissorhiza subrigida	
Hesperantha minima	
Hesperantha oligantha	
Hesperantha rivulicola	
Lapeirousia verecunda	
Moraea kamiesensis	
Moraea namaquana	
Romulea albiflora	
Romulea discifera	
Romulea maculata	
Romulea rupestris	
Family: MOLLUGINACEAE	
Hypertelis trachysperma	
Psammotropha spicata	
Family: ORCHIDACEAE	
Corycium ingeanum	
Disa macrostachya	Disa
Family: OXALIDACEAE	
Oxalis pseudo-hirta	Sorrel
Family: PEDALIACEAE	
Harpagophytum spp.	Devils' claw
Family: POACEAE	
Prionanthium dentatum	
Secale strictum subsp. africanum	Wild rye
Family: PROTEACEAE	
Leucadendron meyerianum	Tolbos
Mimetes spp.	All species
Orothamnus zeyheri	
Family: ROSACEAE	
Cliffortia arborea	Sterboom
Family: SCROPHULARIACEAE	
Charadrophila capensis	Cape Gloxinia
Family: STANGERIACEAE	
Stangeria spp.	Cycads, all species
Family: ZAMIACEAE	
Encephalartos spp.	Cycads, all species

SCHEDULE 2: PROTECTED SPECIES

As per the Northern Cape Nature Conservation Act, No. 9 of 2009, Schedule 2

Family: ACANTHACEAE	
Barleria paillosa	
Monechme saxatile	

Peristrophe spp.	All species
Family: ADIANTHACEAE	
Adiantum spp.	Maidenhair Fern, all species
Family: AGAPANTHACEAE	
Agapanthus spp.	All species
Family: AIZOACEAE (MESEMBRYANTHEMACEAE)	All species
Family: AMARYLLIDACEAE	All species except those listed in Schedule 1
Family: ANTHERICACEAE	All species
Family: APIACEAE	All species except those listed in Schedule 1
Family: APOCYNACEAE	All species except those listed in Schedule 1
Family: AQUIFOLIACEAE	All species
Ilex mitis	
Family: ARACEAE	
Zantedeschia spp.	Arum lilies, all species
Family: ARALIACEAE	
Cussonia spp.	Cabbage trees, all species
Family: ASPHODOLACEAE	All species except those listed in Schedule 1 and the species <i>Aloe ferox</i>
Family: ASTERACEAE	
Helichrysum jubilatam	
Felicia deserti	
Gnaphalium simii	
Lopholaena longipes	
Senecio albo-punctatus	
Senecio trachylaenus	
Trichogyne lerouxiae	
Tripteris pinnatilobata	
Troglophyton acocksianum	
Vellereophyton lasianthum	
Family: BURMANNIACEAE	
Burmannia madagascariensis	Wild ginger
Family: BURSERACEAE	
Commiphora spp.	All species
Family: CAPPARACEAE	
Boscia spp.	Shepherd's trees, all species
Family: CARYOPHYLLACEAE	
Dianthus spp.	All species
Family: CELASTRACEAE	
Gymnosporia spp.	All species
Family: COLCHICACEAE	
Androcymbium spp.	All species
Gloriosa spp.	All species
Family: COMBRETACEAE	
Combretum spp.	All species
Family: CRASSULACEAE	All species except those listed in Schedule 1
Family: CUPPRESSACEAE	
Widdringtonia spp.	Wild cypress, all species
Family: CYATHEACEAE	
Cyathea spp.	Tree ferns, all species
Cyathea capensis	Tree Fern
Family: CYPERACEAE	
Carex acocksii	
Family: DROSERACEAE	
Drosera spp.	Sundews, all species

Family: DRYOPTERIDACEAE	
Rumohra spp.	Seven Weeks Fern, all species
Family: ERICACEAE	Erica, all species
Family: EUPHORBIACEAE	
Alchornea laxiflora	Venda Bead-string
Euphorbia spp.	All species
Family: FABACEAE	
Aspalathus spp.	Tea Bush, all species
Erythrina zeyheri	Ploughbreaker
Argyrobium petiolare	
Caesalpinia bracteata	
Calliandra redacta	
Crotalaria pearsonii	
Indigofera limosa	
Lebeckia bowieana	
Polhillia involucrate	
Rhynchosia emarginata	
Wiborgia humilis	
Family: HYACINTHACEAE	
Daubinya spp	
Lachenalia spp.	Daubinya, all species
Veltheimia spp.	Viooltjie, all species
Eucomis spp.	Pineapple flower, all species
Neopaterosonia namaquensis	
Ornithogalum spp.	All species
Family: IRIDACEAE	All species except those listed in Schedule 1
Family: LAURACEAE	
Ocotea spp.	Stinkwood, all species
Family: MESEMBRYANTHEMACEAE	All species
Family: MELIACEAE	
Nymania capensis	Chinese Lantern
Family: OLEACEAE	
Olea europea subsp. africana	Wild olive
Family: ORCHIDACEAE	Orchids, all species except those listed in Schedule 1
Family: OROBANCHACEAE	
Harveya spp.	Harveya, all species
Family: OXALIDACEAE	
Oxalis spp.	Sorrel, all species except those listed in Schedule 1
Family: PLUMBAGINACEAE	
Afrolimon namaquanum	
Family: POACEAE	
Brachiaria dura var. dura	
Dregeochloa calviniensis	
Pentaschistis lima	
Family: PODOCARPACEAE	
Podocarpus spp.	Yellowwoods, all species
Family: PORTULACACEAE	
Anacampseros spp.	All species
Avonia spp.	All species
Portulaca foliosa	
Family: PROTEACEAE	All species except those listed in Schedule 1
Family: RESTIONACEAE	All species
Family: RHAMNACEAE	

Phylica spp.	All species
Family: RUTACEAE	
Agathosma spp.	Buchu, all species
Family: SCROPHULARIACEAE	
Diascia spp.	All species
Halleria spp.	All species
Jamesbrittenia spp.	All species
Manulea spp.	All species
Nemesia spp.	All species
Phyllopodium spp.	All species
Polycarena filiformis	
Chaenostoma longipedicellatum	
Family: STRELITZIACEAE	
Strelitzia spp.	All species
Family: TECOPHILACEAE	
Cyanella spp.	All species
Family: THYMELAEACEAE	
Gnidia leipoldtii	
Family: ZINGIBERACEAE	
Siphonochilus aethiopicus	Wild ginger