Terrestrial Plant Species Compliance Statement

prepared in accordance with the
"Protocol for the Specialist Assessment and minimum report content requirements for environmental impacts on Terrestrial Plant Species"

Proposed development of the Ferrum Mookodi 400 kV power Line between Vryburg and Kathu in the Northern Cape and North West Provinces

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Terrestrial Plant Species Compliance Statement Report for the proposed Kimberley Strengthening Phase 3 in the Northern Cape and North West Provinces

1 November 2024

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SPECIALIST DETAILS & DECLARATION

This report has been prepared in accordance with the "Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial plant species", as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), published in GN. No. 320, dated 20 March 2020. It has been prepared independently of influence or prejudice by any parties.

The details of the Specialists are as follows –

Table 1: Details of Specialist

Specialist	Qualification and accreditation
Dr David Hoare (Pr.Sci.Nat.)	• PhD Botany • SACNASP Reg. no. 400221/05 (Ecology, Botany)

Declaration of Independence:

David Hoare Consulting (Pty) Ltd is an independent consultant and hereby declares that it does not have any financial or other vested interest in the undertaking of the proposed activity other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998). In addition, remuneration for services provided by David Hoare Consulting (Pty) Ltd is not subjected to or based on approval of the proposed project by the relevant authorities responsible for authorising this proposed project.

Disclosure:

David Hoare Consulting (Pty) Ltd undertake to disclose to the competent authority any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and will provide the competent authority with access to all information at its disposal regarding the application, whether such information is favourable to the applicant or not.

Based on the information provided to David Hoare Consulting (Pty) Ltd by the client and in addition to information obtained during this study, David Hoare Consulting (Pty) Ltd present the results and conclusion within the associated document to the best of the author's professional judgement and in accordance with best practice.

_____ 1 November 2024

Dr David Hoare Date

TERMS OF REFERENCE

This report is prepared in compliance with the PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON TERRESTRIAL PLANT SPECIES

This assessment follows the requirements of The Environmental Impact Assessment Regulations' requirements, as promulgated in Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), published in GN. No. 320 dated 20 March 2020 for Terrestrial Biodiversity, and in GN. No. 1150 dated 30 October 2020 for Terrestrial Plant Species. As per these Regulations, the approach for assessing sensitivity with respect to Terrestrial Plant Species is in accordance with guidelines described in the latest version of the "*Species Environmental Assessment Guideline*", available at https://bgis.sanbi.org/.

The assessment and minimum reporting requirements of these protocols are associated with a level of environmental sensitivity identified by the national web-based environmental screening tool (screening tool). The screening tool can be accessed at:

https://screening.environment.gov.za/screeningtool.

INTRODUCTION

Project description and location

The proposed project entails the construction of the 400 kV powerline between the existing Mookodi and Ferrum substations as part of the Kimberly Strengthening Phase 3 scheme. The Mookodi substation is south of Vryburg in North West Province, and the Ferrum substation is south of Kathu in the Northern Cape Province. The scope of work that has been assessed in this report entails:

(i) Construction and operation of ±260km, 400kV transmission powerline from Ferrum Substation
(ii) Upgrade the Mookodi Substation by installing:
- 1 X 100MVAr busbar reactor at Mookodi 400kV busbar;
- 1x400kV Mookodi feeder bay;
- 1X400kV Line reactor at Mookodi 400kV.

(iii) Upgrade the Ferrum Substation by installing
- 1 X 100MVAr busbar reactor at Ferrum 400kV busbar;
- 1x400kV Ferrum feeder bay; and
- 1X400kV Line reactor at Ferrum 400kV

The project was initiated due to the anticipated load growth and to address the number of customer applications in the Kimberley vicinity. The project will enable connections for key customers in the vicinity (including IPPs), and the 400 kV corridor will play a crucial role in evacuating renewable power from the Northern Cape to other major load centers in the country.

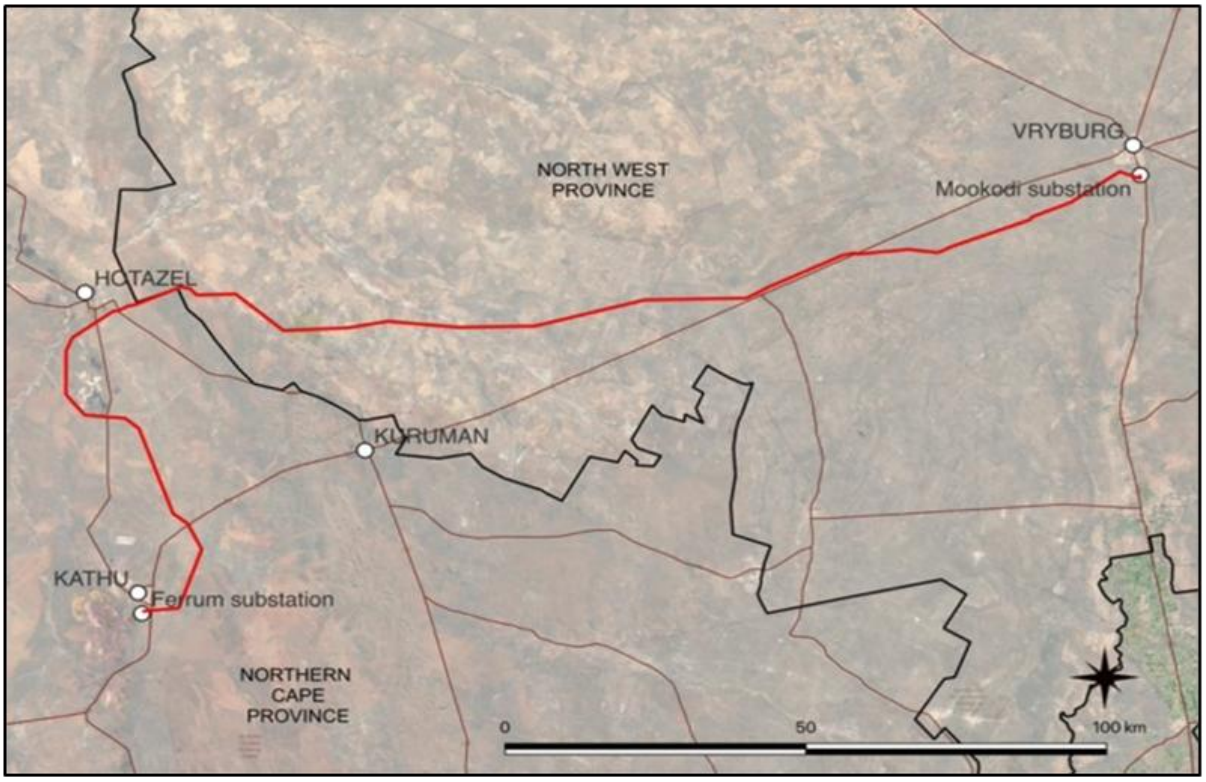


Figure 1: Location of the Ferrum-Mookodi 400 kV line.

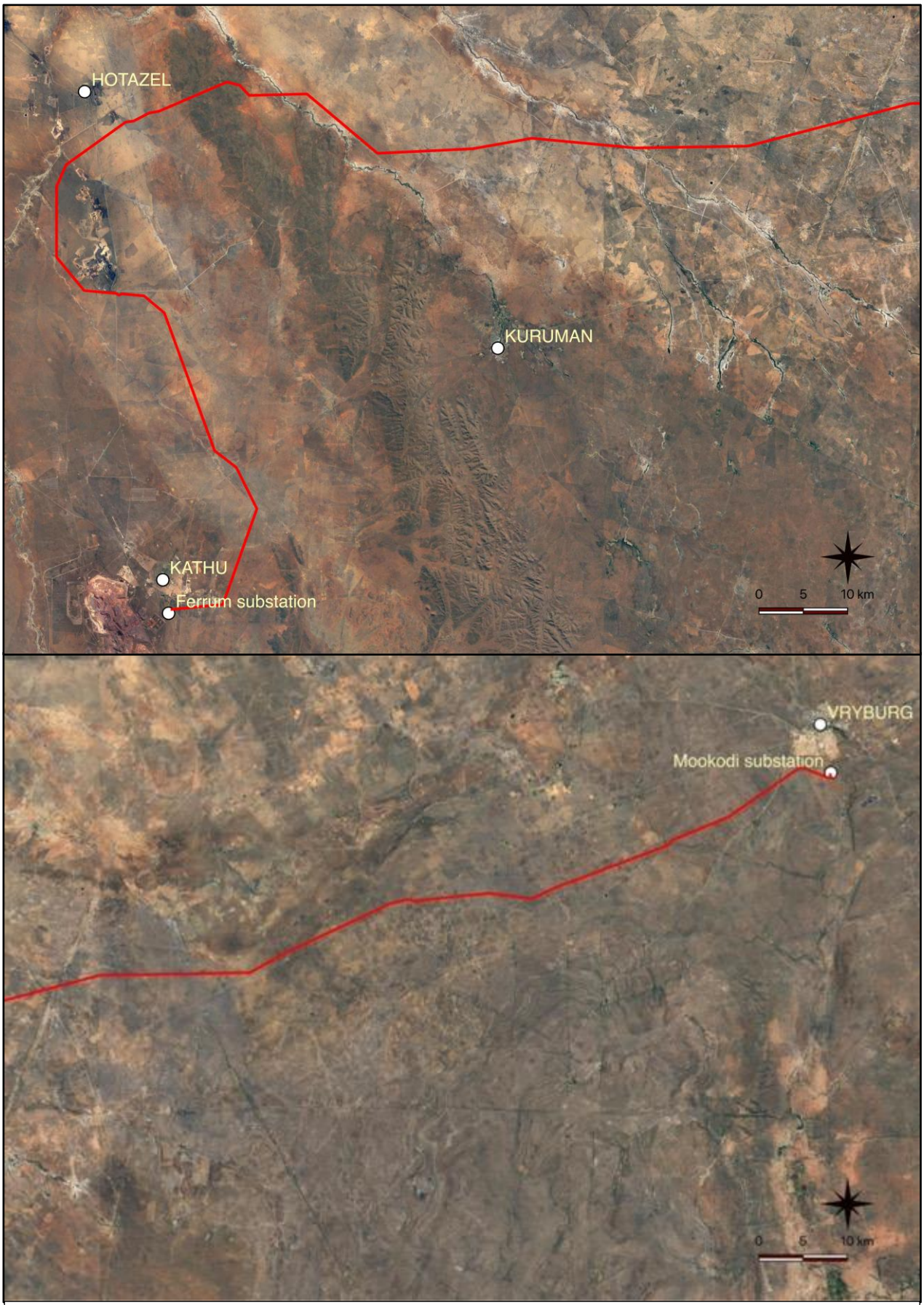


Figure 1: Aerial image of the corridor.

Identified Theme Sensitivities

A sensitivity screening report from the DFFE Online Screening Tool was requested in the application category: Utilities Infrastructure | Powerline. The DFFE Screening Tool report for the area indicates the following ecological sensitivities:

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

Plant Species theme

Sensitivity features are indicated as follows:

Sensitivity	Feature(s)
Low	Low Sensitivity
Medium	Dicoma kurumanii
Medium	Barleria media

Terrestrial Biodiversity theme

Sensitivity features are indicated as follows:

Sensitivity	Feature(s)
Low	Low Sensitivity
Very High	CBA1
Very High	ESA
Very High	ESA1

ASSESSMENT METHODOLOGY

The detailed methodology followed, and the sources of data and information used as part of this assessment are described below.

Project Area of Influence (PAOI)

The proposal is to construct a powerline within the defined corridor area. The corridor width is 55-90 m for most of the assessed alignment. All impacts associated with the construction and operation of the powerline will be contained within the corridor area. The PAOI is therefore treated here as the corridor (example in Figure 3).

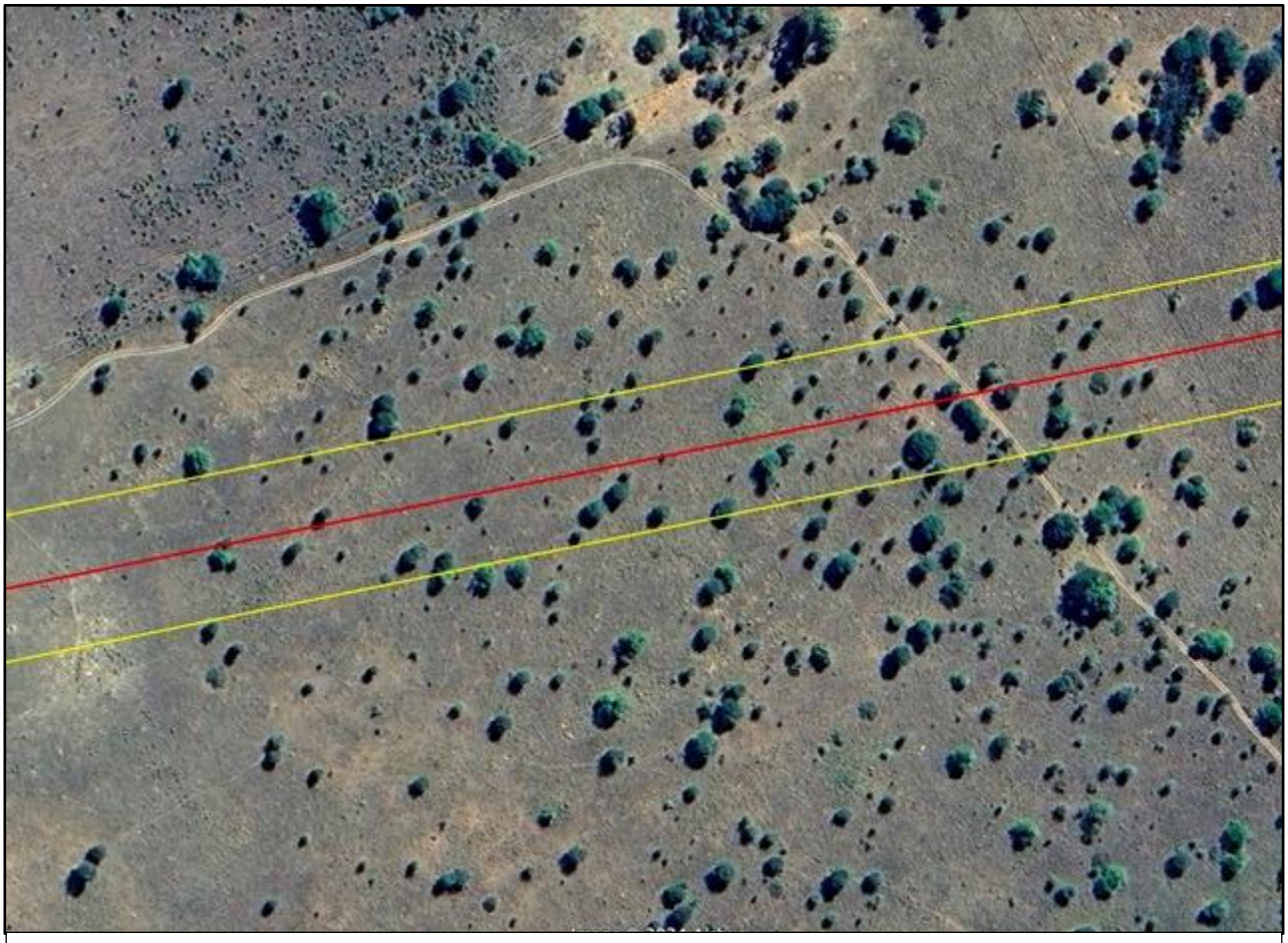


Figure 2: Example of corridor area (yellow lines) in landscape near Vryburg.

Survey timing

The study commenced as a desktop study followed by a site-specific field study from 9 to 19 September 2024. The site is within the Savanna Biome, which has a summer rainfall season (Figure 4). A more accurate indication of rainfall seasonality, which drives most ecological processes, is shown in Figure 5, which shows that Kathu has strongly seasonal summer rainfall, with peak rainfall from December to March (Vryburg has the same pattern). The overall condition of the vegetation could be determined with a moderate-high degree of confidence.

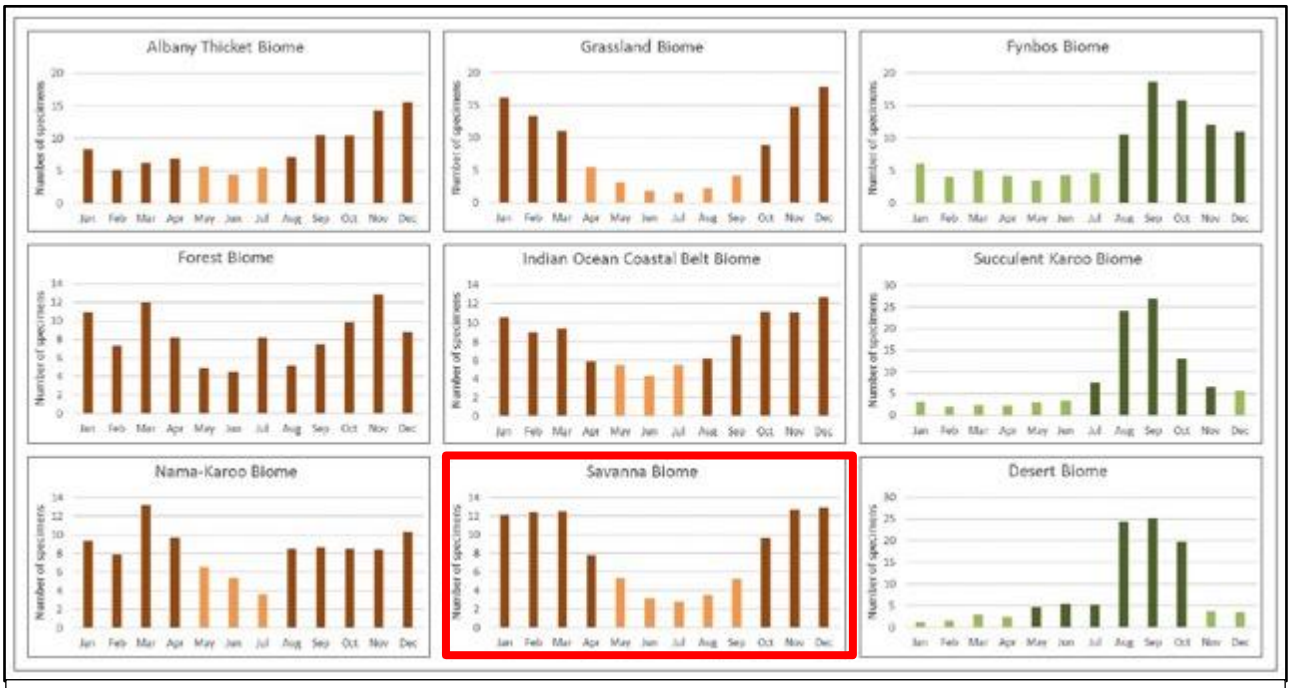


Figure 3: Recommended survey periods for different biomes (Species Environmental Assessment Guidelines). The corridor is within the Nama-Karoo Biome.

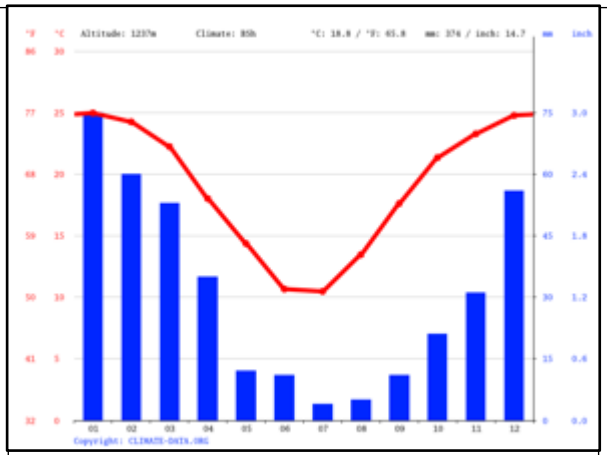


Figure 4: Climate diagrams showing monthly rainfall for Kathu.

Field survey approach

During the field survey of habitats on site, the entire corridor was assessed on foot or by vehicle. A meander approach was adopted with no time restrictions - the objective was to comprehensively examine all-natural variation. A hand-held Garmin GPSMap 64s was used to record a track within which observations were made. Digital photographs were taken of features and habitats on site and of all plant species that were seen. All plant species recorded were uploaded to the iNaturalist website and are accessible by viewing the observations located at this site.

Aerial imagery from Google Earth was used to identify and assess habitats on site. This included historical imagery that may show information not visible in any single dated image. Patterns identified from satellite imagery were verified on the ground.

Sources of information

Regional Vegetation

- Broad vegetation types occurring on site were obtained from Mucina and Rutherford (2006), with updates according to the SANBI BGIS website (http://bgis.sanbi.org), as follows:
    - Mucina, L. and Rutherford, M.C. (editors) 2006. Vegetation map of South Africa, Lesotho and Swaziland: an illustrated guide. Strelitzia 19, South African National Biodiversity Institute, Pretoria.
    - South African National Biodiversity Institute 2018 Final Vegetation Map of South Africa, Lesotho and Swaziland [Vector] 2018. Available from the Biodiversity GIS website, downloaded on 23 September 2021.

Plant species

- Broad vegetation types occurring on site were obtained from Mucina and Rutherford (2006), with updates according to the SANBI BGIS website. The description of each vegetation type includes a list of plant species that may be expected to occur within the particular vegetation type.
- Plant species that could potentially occur in the general area were extracted from the NewPosa database of the South African National Biodiversity Institute (SANBI) for the quarter-degree grids in which the site is located.
- The IUCN Red List status for plant species and supplementary information on habitats and distribution was obtained from the SANBI Threatened Species Programme (Red List of South African Plants, www.redlist.sanbi.org/).
- Lists were compiled specifically for any species at risk of extinction (Red List species) previously recorded in the area. Historical occurrences of threatened plant species were obtained from the South African National Biodiversity Institute for the quarter degree grids within which the study area is situated. Habitat information for each species was obtained from various published sources. The probability of finding any of these species was then assessed by comparing the habitat requirements with those habitats that were found during the field survey of the site, to occur there.
- Regulations published for the National Forests Act (Act 84 of 1998) (NFA) as amended, provide a list of protected tree species for South Africa. The species on this list were assessed to determine which protected tree species have a geographical distribution that coincides with the study area and habitat requirements that may be met by available habitat in the study area. The species distribution on this list was obtained from published sources (e.g. van Wyk & van Wyk 1997) and from the SANBI database (www.newposa.sanbi.org) for quarter degree grids in which species have been previously recorded. Species that have been recorded anywhere near the site (within 50 km), or where it is considered possible that they could occur there, were listed and considered at risk of occurring there.

DESCRIPTION OF SITE

Regional vegetation type

The corridor passes through several regional vegetation types. They all fall within the Eastern Kalahari Bushveld Bioregion(Figure 6). Near Vryburg are two vegetation types, namely Ghaap Plateau Vaasbosveld and Mafikeng Bushveld, which then transition to Kuruman Vaalbosveld further west. This then becomes Kuruman Thornveld before crossing the hills, which are covered by Kuruman Mountain Bushveld. On the Kathu side is a single vegetation type, Kathu Bushveld.

The three vegetation types on the Vryburg side (Ghaap Plateau Vaalbosveld, Kuruman Vaalbosveld, and Mafikeng Bushveld, are all open vegetation types with extensive grassy plains and scattered trees. Kathu Bushveld is similar in structure but has a higher density and diversity of trees. Kuruman Thornveld is densely thorny in the study area, possibly due to overgrazing leading to blackthorn densification (*Senegalia mellifera*). The areas north of Kuruman are also heavily impacted by extensive settlements, whereas the remaining areas are mostly commercial farmland in relatively good condition.

Detailed descriptions of vegetation types are published and available on the SANBI BGIS website. On-site observations indicate that the patterns seen on site conform to these general published descriptions.

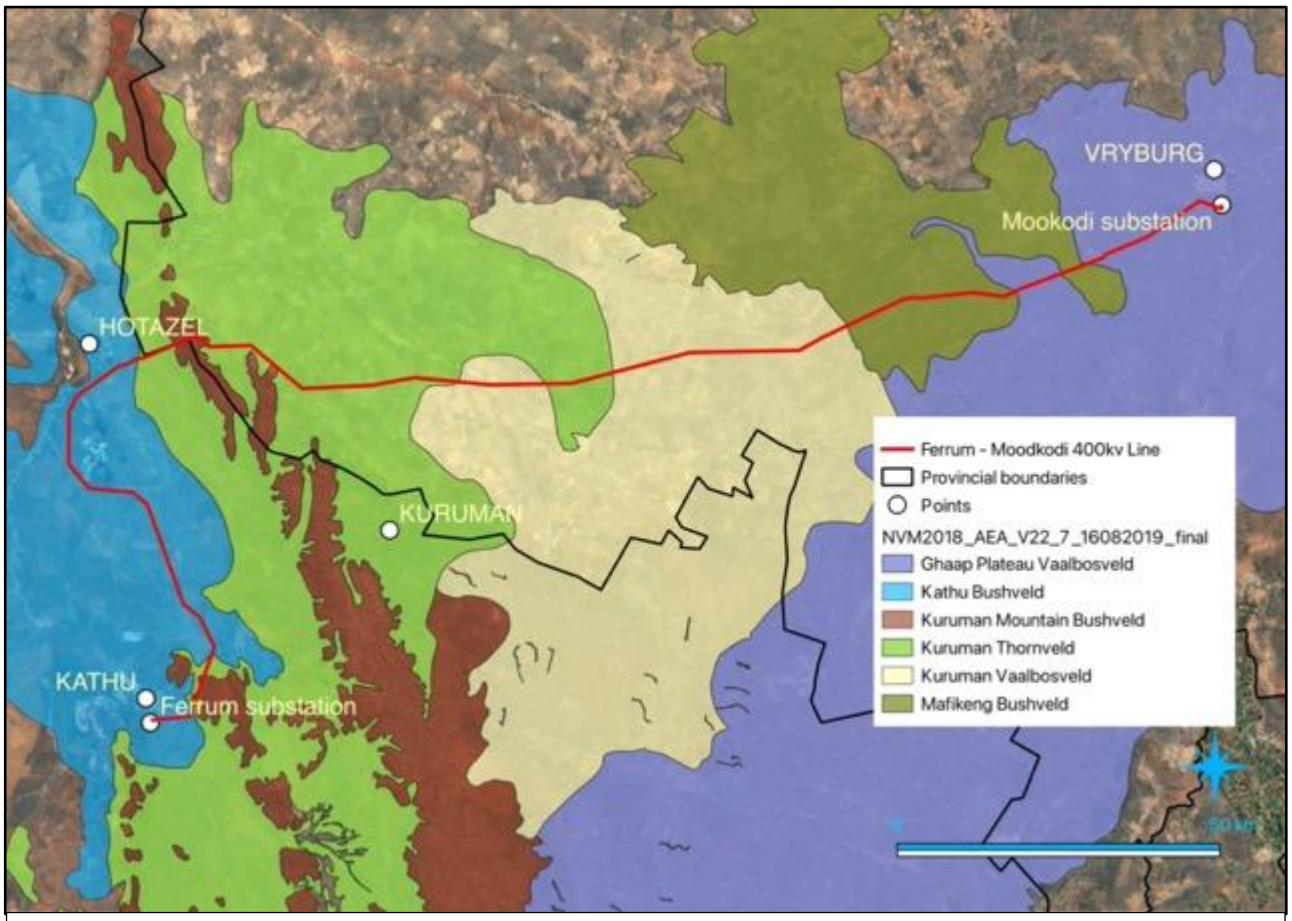


Figure 5: Regional vegetation types.

Biodiversity conservation plans

The North-West Province Biodiversity Conservation Assessment (obtained from bgis.sanbi.org) provides maps that show Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs), corridors and hills. Similarly, The Northern Cape Critical Biodiversity Area (CBA) map classifies the natural vegetation of the province according to conservation value in decreasing value, as follows:

1. Protected
2. Critical Biodiversity Area One (Irreplaceable Areas) (RED)
3. Critical Biodiversity Area Two (Important Areas) (ORANGE)
4. Ecological Support Area (GREEN)
5. Other Natural Area (YELLOW)

A combined map showing areas within the study area that fall within these classes is shown in Figure 7 and includes the following:

1. Critical Biodiversity Areas: CBA are found near the rocky ridges in the Northern Cape. The area within the alignment is less than a hectare.
2. Ecological Support Areas: Ecological Support Areas (ESAs) in the study area are corridors aligned to coincide with major topographical features to provide connectivity between CBA1 and 2 areas. The ESA is, therefore, a drainage valley and an associated landscape corridor that links other areas with high biodiversity conservation value. There are three such corridors in the NW part of the project area. In the NC, the ridge is also a corridor; on the Kathu side, all drainage lines are ESAs.

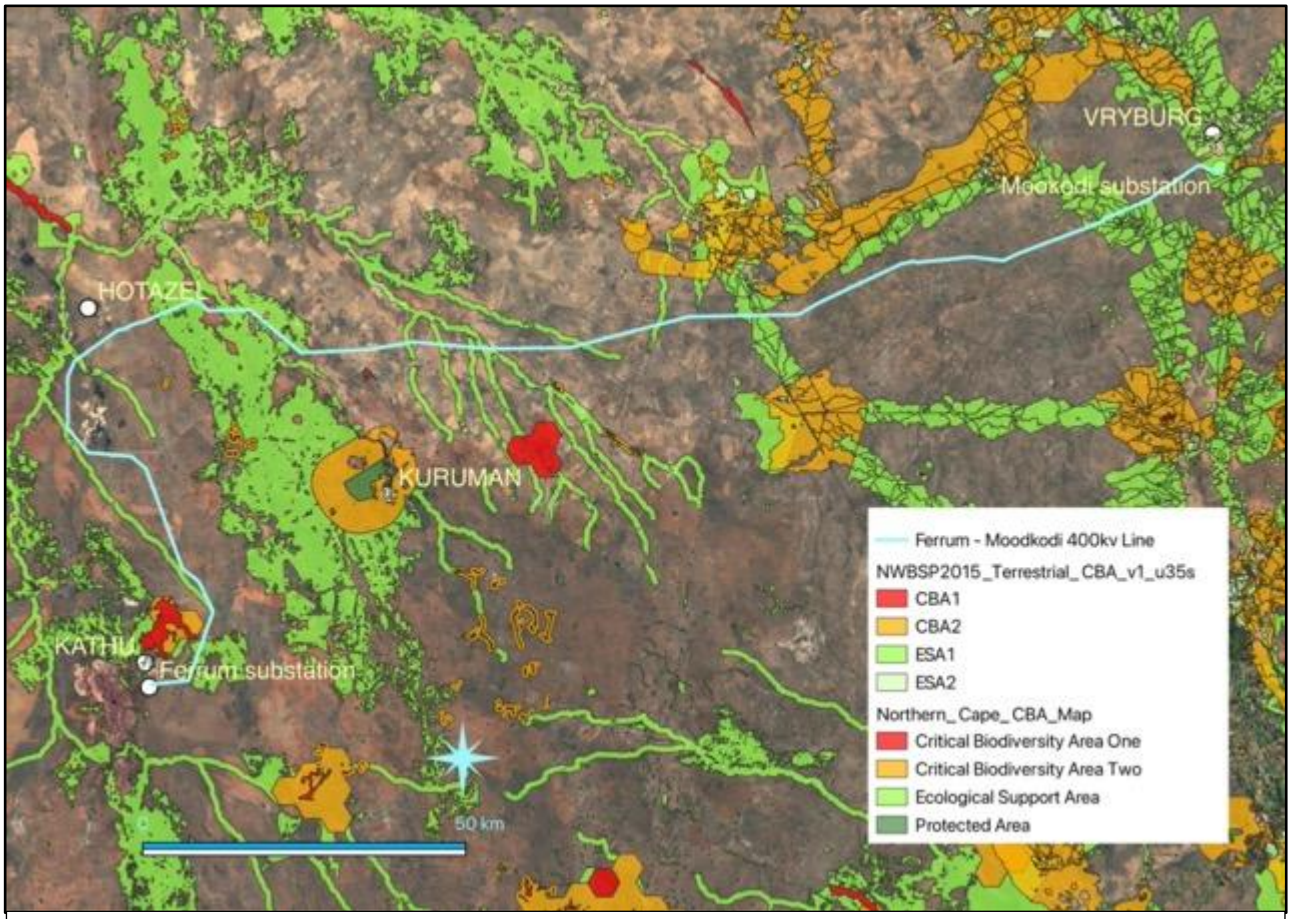


Figure 6: Critical biodiversity areas of the study area.

The presence of the ESAs indicates that the site has importance in a wider ecological context for supporting biodiversity patterns. The ESAs on site correspond to those parts of the site flagged in the Screening Tool report as being of Very High sensitivity, confirming this pattern. These parts of the landscape have Very High sensitivity with respect to the Terrestrial Biodiversity Theme.

Plant species seen on site

The powerline corridor runs through a semi-arid landscape consisting of moderately undulating plains intersected by shallow river valleys and intermittent hills, ridges and outcrops (see Figures 8 - 11). There are also regular drainage valleys of various dimensions crossing the corridor. The flora differs between these different parts of the landscape, primarily determined by broad soil properties - the plains tend to have relatively deep sandy or loamy soils, but low rock cover; the ridges and hills have shallow soils and high rock and stone cover; and the drainage areas tend to have deep, fine-grained soils with few rocks, bordered by very rocky areas. Some of the river valleys are bordered by bands of calcrete. There are several shallow pan-like depressions along the corridor.

A total of 129 plant species were found within the corridor. None of these are Red List species.

There was a moderately high diversity of grasses and sedges, of which the following were common and widespread within terrestrial habitats: *Aristida congesta subsp congesta, Aristida meridionalis, Cenchrus ciliaris, Cymbopogon caesius, Cymbopogon pospischilii, Cynodon dactylon, Digitaria eriantha, Elionurus muticus, Enneapogon cenchroides, Eragrostis echinochloidea, Eragrostis gummiflua, Eragrostis lehmanniana, Eragrostis rigidior, Eragrostis superba, Fingerhuthia africana, Heteropogon contortus, Pogonarthria squarrosa, Schmidtia pappophoroides, Stipagrostis uniplumis, Themeda triandra* and *Tragus koelerioides*. A small number of grass and *sedge species only occur in wetland habitats (riparian areas and pans), namely Afroscirpoides* dioeca, *Andropogon sp., Cyperus marginatus, Hemarthria altissima, Imperata cylindrica, Juncus effusus*, *Schoenoplectus muricinux*, *Triraphis andropogonoides* and *Typha capensis*.

As would be expected in bushveld vegetation, there was a high number of tree and shrub species, including *Asparagus laricinus, Asparagus suaveolens, Boscia albitrunca, Cadaba aphylla, Diospyros austro-africana, Euclea crispa, Euclea undulata, Grewia flava, Gymnosporia buxifolia, Hertia pallens, Lycium cinereum, Lycium pilifolium, Olea europaea subsp cuspidata, Rhigozum obovatum, Rhigozum trichotomum, Searsia ciliata, Searsia lancea, Searsia tridactyla, Senegalia mellifera, Tarchonanthus camphoratus, Terminalia sericea, Vachellia erioloba, Vachellia haematoxylon, Vachellia hebeclada, Vachellia karroo, Vachellia tortilis* and *Ziziphus mucronata*.

Vegetation patterns are influenced by land-use. Extensive communal settlements are in the area north of Kuruman, where the vegetation cover has been reduced through overgrazing.

	**Photo 5875** **27° 00' 46.29" S, 24° 44' 41.54" E** **Grassland with low shrubs at Mookodi substation near Vryburg.**
	**Photo 5879** **27° 00' 45.41" S, 24° 44' 02.10" E** **Mixed bushveld near Vryburg containing divese grassland, shrubs and low trees. The grey shrub is *Tarchonanthus camphoratus* (vaalbos), after which the vegetation type is named (Ghaap Plateau Vaalbosveld). The low trees are mostly *Vachellia tortilis*.**
	**Photo 6061** **27° 06' 24.01" S, 24° 29' 24.33" E** **Open grassland with scattered thorn trees, many of which are small camelthorn trees, *Vachellia erioloba*.**

Figure 7: Typical landscape towards the Vryburg end of the corridor.

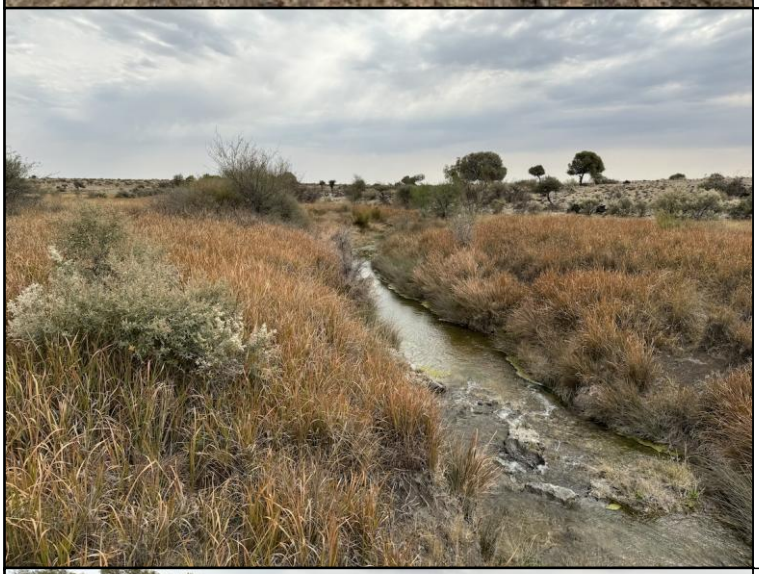
	**Photo 6147** **27° 08' 04.44" S, 24° 19' 58.73" E** **Shallow depression in grassland area.**
	**Photo 6401** **27° 15' 40.29" S, 23° 35' 01.25" E** **Riparian vegetation with flowing stream and grass-dominated banks.**
	**Photo 6403** **27° 15' 40.43" S, 23° 35' 00.73" E** **Calcrete outcrop on slopes overlooking river valley. This habitat contained several species that do not occur elsewhere in the landscape, including the small succulent *Prepodesma orpenii*.**

Figure 8: Some of the atypical habitats within the corridor.

	**Photo 6455** **27° 15' 41.95" S, 23° 24' 33.62" E** **Heavily grazed areas north of Kuruman.**
	**Photo 6539** **27° 12' 25.96" S, 23° 10' 51.73" E** **Areas dominated by impenetrable thickets of blackthorn, *Senegalia mellifera*.**
	**Photo 6566** **27° 12' 11.04" S, 23° 08' 37.09" E** **Groves of large, tall camelthorn trees, *Vachellia erioloba*.**

Figure 9: Typical landscape in the area north of Kuruman.

	**Photo 6611** **27° 12' 24.96" S, 23° 05' 28.00" E** **Vegetation on the ridge near Sedibeng, representing Kuruman Mountain Bushveld. The vegetation is dominated by blackthorn, Senegalia mellifera, on shallow stony soils. The vegetation has probably been heavily impacted by overgrazing - other locations further south have higher grass cover and more diverse woody species composition.**
	**Photo 6640** **27° 13' 10.29" S, 23° 03' 28.54" E** **Area adjacent to Magobing village.**
	**Photo 6672** **27° 15' 58.46" S, 22° 57' 56.93" E** **Typical bushveld between Kathu and Hotazel with tall grassland and mixed woody species on deep red sandy soils.**

Figure 10: Typical landscape towards the Vryburg end of the corridor.

Protected trees

In terms of section 15(1) of the National Forests Act, 1998, no person may cut, disturb, damage or destroy any protected tree; or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any product derived from a protected tree, except under a licence or exemption granted by the Minister of Agriculture, Forestry and Fisheries. The list of Protected Tree Species under the National Forest Act, 1998 (Act No. 84 of 1998) is attached as Appendix 2. The most recent version of this list was published in the Government Gazette No. 50291 on 13 March 2024, designated as GN No. 4496 of 2024, and contains 51 species distributed across South Africa.

The following species have a geographical distribution that includes the corridor:

1. *Vachellia erioloba*.
2. *Vachellia haematoxylon.*
3. *Boscia albitrunca.*

All three species of protected trees were found on site in large numbers. The most commonly occurring species is camelthorn, *Vachellia erioloba*, which occurs along almost the entire corridor, sometimes as scattered trees, other times as dense groves, and elsewhere as high densities of juveniles. A typical group is shown in Figure 12. See also Figure 10 (bottom).

Figure 11: Camelthorn, *Vachellia erioloba*, seen within the corridor.

Boscia albitrunca (shepherds tree), mostly as scattered individuals (example in Figure 13). The highest densities are on the Hotazel side of the ridge and on either bank of the one river system on the eastern side of the ridge (Figure 14). A total of 253 individual trees were seen within the corridor. The shepherd's trees in these areas were unusual in that they were all relatively large individuals, one almost 8 m tall, and there were few juveniles. The trees seen were also the eastern-most distribution records for this species in the Kuruman area. The population observed is therefore considered to have biogeographical and ecological importance. Note that this species is protected under the National Forests Act, 1998 and Schedule 2 of the Northern Cape Nature Conservation Act No. 9 of 2009.

The third protected tree on site was the grey camelthorn, *Vachellia haematoxylon*. It was only seen in those parts of the corridor in line with Kuruman and westwards. The majority of the individuals seen on site were shorter than 2 m tall, many less than 1 m tall. The species coppices after fire and it appears as if the vegetation of large corridor sections were burnt relatively recently. It is probable that these individuals were probably not very large prior to the fire, but the current appearance is of clusters of low plants. In areas where these occur, they are at densities of up to 1000 individuals per km of corridor, counting clusters as single individuals. In unburnt areas, individuals of 3 m tall are rare and most are shorter. There are, however, exceptions, one being a grove of large individuals that meets the requirements for declaration as a forest patch (large trees with touching crowns forming a continuous canopy). These large patches must be avoided, not only due to being protected trees, but also because of the high value they have as faunal habitat.

Other than the three species of protected tree, there are also several large wild olive trees in a part of the alignment that should be protected. These are large, old trees that are unusual in the

Figure 12: Typical example of *Boscia albitrunca* tree seen within the corridor.

landscape due to their age and size. These occurred mostly in a single area on the Kuruman side of the ridge, on either side of the river (Figure 14). This is the same area of habitat in which large *Boscia albitrunca* trees were observed.

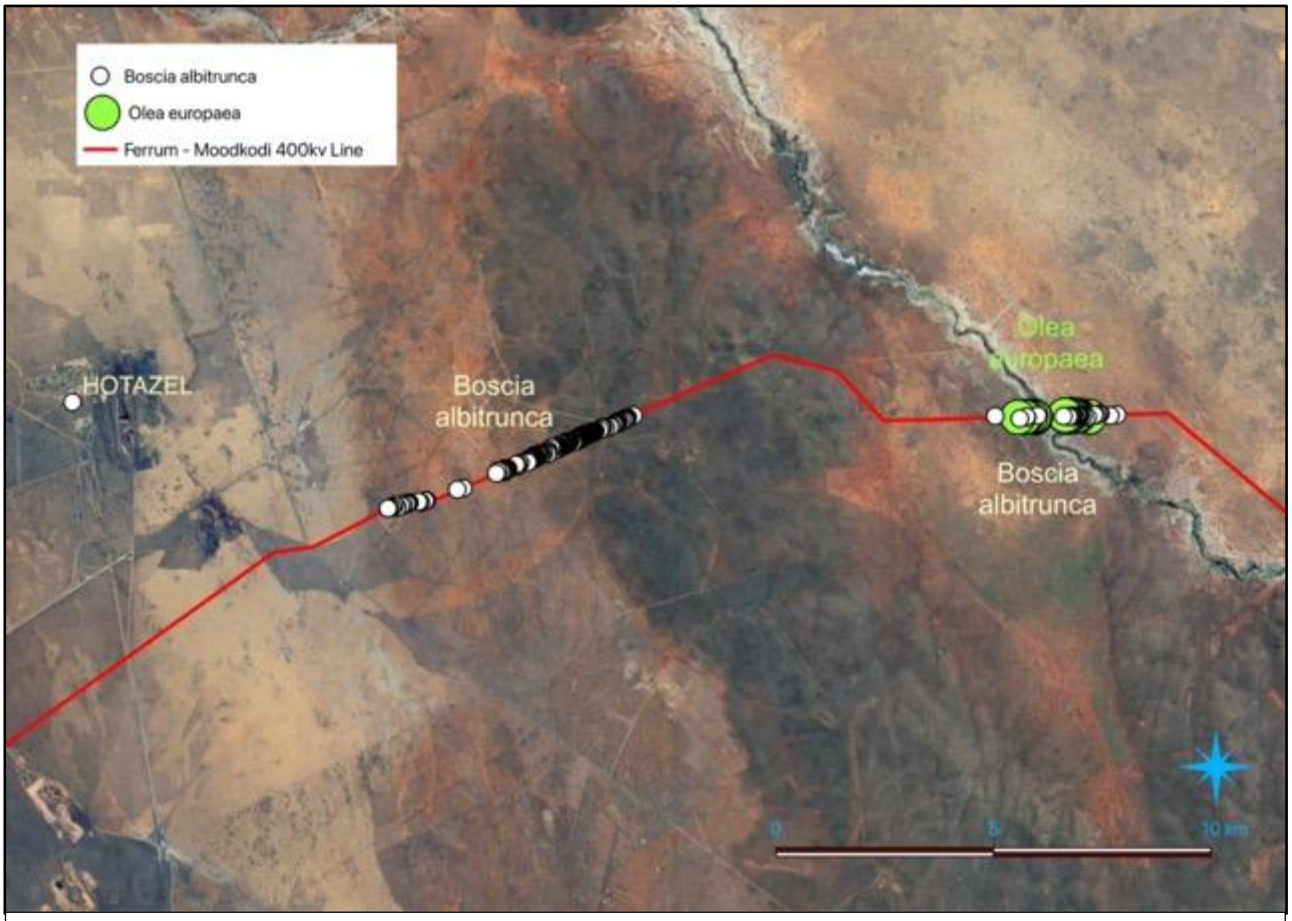


Figure 13: Observed distribution of *Boscia albitrunca* and large *Olea aeropaea* trees within the corridor.

Protected plant species

One species was found on site that is protected under National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004), namely *Harpagophytum procumbens*. Only seeds of this plant were found on site (see Figure 15), but it is an annual creeper and live plants are unexpected to be found at the time of the year that the field survey was undertaken. The seeds were seen 4 times on site, once near Vryburg and the other three times near Sedibeng. It is described as growing in well-drained sandy habitats in open savanna and woodlands. It could therefore occur anywhere along the corridor where sandy soils dominate.

Figure 14: Seed of *Harpagophytum procumbens* seen within the corridor.

Plant species flagged for the study area

According to the National Web-Based Environmental Screening Tool, two plant species of concern are flagged as of concern for the site (see previous section of this report). A full list of the species is provided below in Table 3.

Both species are poorly known, with very few historical collections and no observations on iNaturalist. For *Barleria media* (listed as Vulnerable), according to World Flora Online (worldfloraonline.org) and iNaturalist, this is a synonum of *Barleria macrostegia*, but according to SANBI Biodiversity Advisor, it is a separate and valid species. Assuming it is a valid taxonomic entity, the habitat is described as Kuruman Mountain Bushveld. There are only two historical records for the other species, Dicoma kurumanii (rare). The locality information strongly suggests that this species would also only occur in Kuruman Mountain Bushveld (or similar) habitat. Within the corridor, the areas of Kuruman Mountain Bushveld are in poor condition, overgrazed and possibly cleared, but currently heavily dominated by blackthorn, *Senegalia mellifera*. There is, therefore a small possibility that either of these species could occur on site, but it is not considered to be likely.

No threatened plant species were found on site.

There are therefore no threatened plant species that occur on site, and none that are likely to occur in the corridor. It is therefore verified that the Plant Species Theme has <u>LOW</u> sensitivity for this project on the basis of the following:

1. **Suitable habitat for SCC, but habitat is degraded.**
2. **No SCC found on site that are listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable according the IUCN Red List 3.1. Categories and Criteria.**

Table 2: Plant species of concern flagged for the site in the Screening Tool.

Family	Taxon	IUCN status*	Distribution	Habitat	Probability of occurrence
ASTERACEAE	Dicoma kurumanii	Rare	Occurs from Kuruman in the Northern Cape to the Molopo River on the border with Botswana.	No habitat description. Two records describe location as Jakkalskop, Vryburg Div., and Batharos, on mountain. In both cases, the vegetation type would be Kuruman Mountain Bushveld.	**MEDIUM**, but not seen on site.
ACANTHACEAE	Barleria media	Vulnerable D2	Kalahari region near Kuruman. (According to World Flora Online and iNaturalist, this is a synonum of Barleria macrostegia, but according to SANBI Biodiversity Advisor, it is a separate species)	Kuruman Mountain Bushveld. Uncertain, possibly rocky slopes or koppies. Only two records known. May be a synonym of Barleria macrostegia.	**MEDIUM**, but not seen on site. According to known information, it would only occur on the ridge where Kuruman Mountain Bushveld occurs, which is in poor condition within the corridor.

CONCLUSION

Desktop information, field data collection and analysis of aerial imagery provide the following verifications of patterns for the Plant Species Theme:

1. The corridor crosses a number of regional vegetation types. The published descriptions of these regional vegetation types conform to the patterns seen on site. They all fall within the Eastern Kalahari Bushveld Bioregion. Near to Vryburg are two vegetation types, namely Ghaap Plateau Vaasbosveld and Mafikeng Bushveld, which then transition to Kuruman Vaalbosveld further west. This then becomes Kuruman Thornveld before crossing the hills, which are covered by Kuruman Mountain Bushveld. On the Kathu side is a single vegetation type, Kathu Bushveld. None of these are listed ecosystems.

2. One nationally protected species occurs on site (*Harpagophytum procumbens*). It is also possible that *Dicoma kurumanii* (listed as Rare) or *Barleria media* (listed as Vulnerable) may occur in the low hills, but they are both species that haven't been seen for many years and are unlikely to be encountered, especially in the preferred habitat type, which is in poor condition within the proposed corridor. The project, therefore, has low sensitivity with respect to the Plant Species Theme (as per the published Species Protocols).

3. A number of species protected under the Northern Cape Nature Conservation Act or the North West Biodiversity Management Act were observed within the corridor. Permits will be required for the loss of any individuals of any of these species (see Appendix 1 for lists).

4. There are three protected tree species that occur within the corridor, namely camelthorn (Vachellia erioloba), grey camelthorn (Vachellia haematoxylon, and shepherd's bush (Boscia albitrunca). Permits will be required for the loss of any individuals of these species.

5. The proposed development is almost entirely within areas of natural habitat that have low to moderate biodiversity value and low sensitivity (plant species theme). There are some Ecological Support Areas crossed by the corridor that have Very High sensitivity with respect to the Terrestrial Biodiversity Theme, but the powerline will have little effect on the ecological functioning of these. Where local sensitivities have been identified, recommendations have been made to avoid these, therefore only landscape level ecological functioning is of concern and is not significantly affected by the powerline.

RECOMMENDATIONS

1. An Alien Invasive Management Plan must be compiled for the project.
2. A permit must be obtained for any plant species that are protected under the Northern Cape Nature Conservation Act, 2009 (Act 9 of 2009) and the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004).
3. For all individuals of the protected trees, *Boscia albitrunca*, *Vachellia erioloba*, and *Vachellia haematoxylon,* that will be destroyed for the construction of infrastructure, a permit is required according to the requirements of the National Forests Act.
4. A permit may be required for loss of individuals of the protected plant, *Harpagophytum procumbens*.

The following shifts in the position of tower structures are recommended:

1. Between 505 and 506 are large numbers of large camelthorn trees. It is not possible to shift towers to miss this area, therefore, caution must be taken to minimise impacts on trees in this area.
2. At 469 the tower position should be moved about 30 m towards Vryburg along the current centreline to avoid a clump of camelthorns.
3. At 352 is a dense stand of camelthorns. Tower should be moved 50 m away in either direction along the centreline.
4. At 302 is a dense stand of camelthorns. Tower should be moved 50 m away in either direction along the centreline.
5. At 255 is a dense stand of camelthorns. Tower should be moved 40 m away towards Vryburg along the current centreline.
6. At 250 is a large camelthorn. Tower should be moved 10 m away towards Vryburg along the current centreline.
7. At 211 is a small camelthorn. Tower should be moved 20 m away towards Kathu along the current centreline.
8. At 206 is a large camelthorn. Tower should be moved 40 m away towards Kathu along the current centreline.
9. At 201 is a stand of camelthorns. Tower should be moved 40 m away towards Kathu along the current centreline.
10. At 184 is a large Boscia. Tower should be moved 20 m away towards Vryburg along the current centreline.
11. At 332 the tower is in a drainage line and needs to be shifted out 60 m towards Vryburg. An additional tower may be required to span this sensitivity.
12. At 426 the tower is in a wetland and needs to be moved up to 150 m in either direction. An additional tower may be required to span this sensitivity.
13. At 249 the tower is in a drainage and needs to be moved 65 m towards Vryburg.

REFERENCES

Germishuizen, G., Meyer, N.L., Steenkamp, Y And Keith, M. (eds.) (2006). A checklist of South African plants. Southern African Botanical Diversity Network Report No. 41, SABONET, Pretoria.

IUCN (2001). *IUCN Red Data List categories and criteria: Version 3.1*. IUCN Species Survival Commission: Gland, Switzerland.

Mucina, L. And Rutherford, M.C. (editors) 2006. Vegetation map of South Africa, Lesotho and Swaziland: an illustrated guide. *Strelitzia* 19, South African National Biodiversity Institute, Pretoria.

Mucina, L., Rutherford, M.C. and Powrie, I.W. (editors) 2005. Vegetation map of South Africa, Lesotho and Swaziland, 1:1 000 000 SCALE SHEET MAPS South African National Biodiversity Institute, Pretoria.

Rutherford, M.C. and Westfall., R.H. 1994. Biomes of Southern Africa. An objective characterisation. Memoirs of the Botanical Survey of South Africa 63, 1-94.

Rutherford, M.C., Mucina, L. and Powrie, L.W. 2006. Biomes and Bioregions of Southern Africa. In: L. Mucina and M.C. Rutherford (Eds). The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19, pp. 30-51. South African National Biodiversity Institute, Pretoria.

National Biodiversity Assessment 2018: The status of South Africa's ecosystems and biodiversity. Synthesis Report. Synthesis Report. South African National Biodiversity Institute.

Skowno AL, Matlala M, Slingsby J, Kirkwood D, Raimondo DC, von Staden L, Holness SD, Lotter M, Pence G, Daniels F, Driver A, Desmet PG, Dayaram A (2019). Terrestrial ecosystem threat status assessment 2018 - comparison with 2011 assessment for provincial agencies. National Biodiversity Assessment 2018 Technical Report. South African National Biodiversity Institute, Pretoria.

Van Wyk, A.E. and Smith, G.F. (Eds) 2001. Regions of Floristic Endemism in Southern Africa: A review with emphasis on succulents, pp. 1-199. Umdaus Press, Pretoria.

APPENDICES:

Appendix 1: Plant species recorded on site.

Afroscirpoides dioeca
Aloe grandidentata (Protected NCNCA Schedule 2)
Aloe hereroensis (CITES App II, Protected NCNCA Schedule 2))
Andropogon sp
Aptosimum elongatum
Aptosimum spinescens
Aristida congesta
Aristida meridionalis
Asparagus laricinus
Asparagus suaveolens
Barleria rigida
Berula thunbergii (Protected NCNCA Schedule 2)
Blepharis furcata
Boscia albitrunca (Protected NFA, NCNCA Schedule 2)
Bulbine sp
Bulbostylis sp
Cadaba aphylla
Cenchrus ciliaris
Chara vulgaris
Convolvulus ocellatus
Corchorus asplenifolius
Cyanella lutea
Cymbopogon caesius
Cymbopogon pospischilii
Cynodon dactylon
Cyperus marginatus
Diclis petiolaris
Dicoma macrocephala
Digitaria eriantha
Diospyros austro-africana
Drimia sanguinea (Protected - NWBMA)
Ehretia rigida
Elionurus muticus
Enneapogon cenchroides
Entada elephantina
Eragrostis echinochloidea
Eragrostis gummiflua
Eragrostis lehmanniana
Eragrostis rigidior
Eragrostis superba
Eriocephalus ericoides
Euclea crispa
Euclea undulata
Euphorbia mauritanica (Protected - NWBMA, NCNCA Schedule 2)
Felicia muricata
Fingerhuthia africana
Gazania krebsiana
Geigeria ornativa
Gomphocarpus fruticosus
Gomphocarpus tomentosus

Grewia flava
Gymnosporia buxifolia
Harpagophytum procumbens (Protected - NEMBA, NCNCA Schedule 1)
Helichrysum argyrosphaerum
Helichrysum caespititium
Helichrysum cerastioides
Hemarthria altissima
Hermannia coccocarpa
Hermannia comosa
Hertia pallens
Heteropogon contortus
Hypoestes forskaolii
Hypoxis sp
Imperata cylindrica
Jamesbrittenia atropurpurea
Jamesbrittenia aurantiaca
Juncus effusus
Kalanchoe rotundifolia
Kleinia longiflora
Kohautia amatymbica
Laggera decurrens
Lasiosiphon polycephalus
Lobelia thermalis
Lycium cinereum
Lycium pilifolium
Melolobium candicans
Moraea pallida (Protected NCNCA Schedule 2)
Neltuma velutina (Category 1b invader)
Nicotiana glauca (Category 1b invader)
Oedera humilis
Olea europaea subsp cuspidata
Opuntia ficus-indica (Category 1b invader)
Opuntia robusta (Category 1b invader)
Pearsonia sessilifolia
Pegolettia retrofracta
Peliostomum leucorrhizum
Pellaea calomelanos
Pentzia calcarea
Pogonarthria squarrosa
Pogonospermum distichotrichum
Pogonospermum incanum
Polygala hottentotta
Prepodesma orpenii (Protected NCNCA Schedule 2)
Pteronia glauca
Rhigozum obovatum
Rhigozum trichotomum
Ruschia ruralis (Protected NCNCA Schedule 2)
Salvia radula
Sansevieria aethiopica
Schizocarphus nervosus
Schmidtia pappophoroides
Schoenoplectus muricinux
Searsia ciliata
Searsia lancea
Searsia tridactyla
Sebaea exigua

Senegalia mellifera
Senna italica
Stachys spathulata
Stipagrostis uniplumis
Tapinanthus oleifolius
Tarchonanthus camphoratus
Terminalia sericea
Themeda triandra
Thesium sp
Tragus koelerioides
Triraphis andropogonoides
Typha capensis
Vachellia erioloba (Protected NFA)
Vachellia haematoxylon (Protected NFA)
Vachellia hebeclada
Vachellia karroo
Vachellia tortilis
Ziziphus mucronata

Appendix 2: Protected tree species of South Africa.

SCHEDULE A

Botanical name	**English common names**	**Other common names** **Afrikaans (A), Sepedi (P), Sesotho (S), Setswana (T), Tshivenda (V), isiXhosa (X), isiZulu (Z), Xitsonga (XT)**	**National tree number**
Acacia erioloba	Camel thorn	Kameeldoring (A)/Mogohlo (NS)/Mogo̍tlho̍ (T)/	168
Acacia haematoxylon	Grey camel thorn	Vaalkameeldoring (A)/Mokholo (T))	169
Adansonia digitata	Baobab	Kremetart (A)/Seboi (NS)/Mowana (T)/Ximuwu (XT	467
Afzelia quanzensis	Pod mahogany	Peulmahonie (A)/Mutokota (V)/Inkehli (Z)	207
Balanites subsp. *maughamii*	Torchwood	Groendoring (A)/Ugobandlovu (Z)	251
Barringtonia racemosa	Powder-puff tree	Poeierkwasboom (A)/Iboqo (Z)	524
Boscia albitrunca	Shepherd's tree	Witgat (A)/Mohlo̍pi (NS)/Motlho̍pi (T)/ Muvhombwe (V)/Umgqomogqomo (X)/Umvithi (Z)	122
Brachystegia spiciformis	Msasa	Msasa (A)	198.1
Breonadia salicina	Matumi	Mingerhout (A)/Mohlome̍ (NS)/Mutu-lume (V)/Umfomfo (Z)	684
Bruguiera gymnorrhiza	Black mangrove	Swartwortelboom (A)/isiKhangati (X)/IsiHlobane (Z)	527
Cassipourea swaziensis	Swazi onionwood	Swazi-uiehout (A)	531.1
Catha edulis	Bushman's tea	Boesmanstee (A)/Mohlatse (NS)/Igqwaka (X)/Umhlwazi (Z)	404
Ceriops tagal	Indian mangrove	Indiese wortelboom (A)/isinkaha (Z)	525
Cleistanthus schlechteri var. *schlechteri*	False tamboti	Bastertambotie (A)/Umzithi (Z)	320
Colubrina nicholsonii	Pondo weeping thorn	Pondo-treurdoring (A)	453.8
Combretum imberbe	Leadwood	Hardekool (A)/Mohwelere-tsho̍pi (NS)/Motswiri (T)/Impondondlovu (Z)	539
Curtisia dentata	Assegai	Assegaai (A)/Umgxina (X)/Umagunda (Z)	570

Elaeodendron transvaalensis	Bushveld saffron	Bosveld-saffraan (A)/Monomane (T)/Ingwavuma (Z)	416
Erythrophysa transvaalensis	Bushveld red balloon	Bosveld-rooiklapperbos (A)/Mofalatsane (T)	436.2
Euclea pseudebenus	Ebony guarri	Ebbeboom-ghwarrie (A)	598
Ficus trichopoda	Swamp fig	Moerasvy (A)/Umvubu (Z)	54
Leucadendron argenteum	Silver tree	Silwerboom (A)	77
Lumnitzera racemosa var. *racemosa*	Tonga mangrove	Tonga-wortelboom (A)/isiKhaha-esibomvu (Z)	552
Lydenburgia abbottii	Pondo bushman's tea	Pondo-boesmanstee (A)	407
Lydenburgia cassinoides	Sekhukhuni bushman's tea	Sekhukhuni-boesmanstee (A)	406
Mimusops caffra	Coastal red milkwood	Kusrooimelkhout (A)/Umthunzi (X)/Umkhakhayi (Z)	583
Newtonia hildebrandtii var. *hildebrandtii*	Lebombo wattle	Lebombo-wattel (A)/Umfomothi (Z)	191
Ocotea bullata	Stinkwood	Stinkhout (A)/Umhlungulu (X)/Umnukane (Z)	118
Ozoroa namaquensis	Gariep resin tree	Gariep-harpuisboom (A)	373.2
Philenoptera violacea	Apple-leaf	Appelblaar (A)/Mphata (NS)/Mohata (T)/isiHomohomo (Z)	238
Pittosporum viridiflorum	Cheesewood	Kasuur (A)/Kgalagangwe (NS)/Umkhwenkwe (X)/Umfusamvu (Z)	139
Podocarpus elongatus	Breede River yellowwood	Breërivier geelhout (A)	15
Podocarpus falcatus (Afrocarpus falcatus)	Outeniqua yellowwood	Outniekwageelhout (A)/Mogo̍bago̍ba (NS)/Umkhoba (X)/Umsonti (Z)	16
Podocarpus henkelii	Henkel's yellowwood	Henkel se geelhout (A)/Umsonti (X)/Umsonti (Z)	17
Podocarpus latifolius	Real yellowwood	Regte-geelhout (A)/Mogo̍bago̍ba (NS)/Umcheya (X)/Umkhoba (Z)	18
Protea comptonii	Saddleback sugarbush	Barberton-suikerbos (A)	88
Protea curvata	Serpentine sugarbush	Serpentynsuikerbos (A)	88.1
Prunus africana	Red stinkwood	Rooistinkhout (A)/Umkhakhase (X)/Umdumezulu (Z)	147
Pterocarpus angolensis	Wild teak	Kiaat (A)/Moro̍to̍ (NS)/Mokwa (T)/Mutondo (V)/Umvangazi (Z)	236
Rhizophora mucronata	Red mangrove	Rooiwortelboom (A)/isiKhangathi (X)/Umhlume (Z)	526

Sclerocarya birrea subsp. *caffra*	Marula	Maroela (A)/Morula (NS)/Morula (T)/Umganu (Z) /Nkanyi (XT)	360
Securidaca longepedunculata	Violet tree	Krinkhout (A)/Mmaba (T)	303
Sideroxylon inerme subsp. *inerme*	White milkwood	Witmelkhout (A)/Ximafana (X)/Umakhwelafingqane (Z)	579
Tephrosia pondoensis	Pondo poison pea	Pondo-gifertjie (A)	226.1
Warburgia salutaris	Pepper-bark tree	Peperbasboom (A)/Molaka (NS)/Mulanga (V)/isiBaha (Z)	488
Widdringtonia cedarbergensis	Clanwilliam cedar	Clanwilliamseder (A)	19
Widdringtonia schwarzii	Willowmore cedar	Baviaanskloofseder (A)	21
Berchemia zeyheri *(RHAMNACEAE) LC*	Red ivory Pink ivory	Rooi-ivoor (A) / Rooihout (A) / Monee (S) / umNeyi (SW) / umNini (Z, X) / Xiniyani (TS) / Moye (T) / Munia-niane (V)	450
Diospyros mespiliformis *(EBENACEAE) LC*	Jackal berry	Jakkalsbessie (A) / Musuma (V) / Muntoma (TS) / Mgula (TS)	606
Schinziophyton rautanenii	Manketti / Mongongo	Mankettiboom (A) / Monghongho (T) / Makongwa (T)	337
Umtiza listeriana	Umtiza	Umtiza (X) / Omtisa (A)	205

Appendix 3: Flora species protected under the North West Biodiversity Management Act, No. 4 of 2004

(Published in Provincial Gazette No. 7721, 3 January 2017)

KINGDOM PLANTAE

Aloe braamvanwykii (CR)
Anacampseros decapitate (VU)
Barleria media (VU)
Blepharis angusta (endemic to NW)
Brachystelma (all species) – those recorded near to the site include the following: burchellii var. burchellii, circinatum, cupulatum, dimorphum subsp. gratum (CR), foetidum, **incanum** (VU), nanum, ramosissimum, stenophyllum
Ceropegia insignis (EN)
Ceropegia stentiae (EN)
Cineraria austrotransvaalensis (NT)
Cineraria exilis (DDT)
Cleome conrathii (NT)
Commelina bella (DDT)
Cynodon polevansii
Delosperma leendertziae (NT)
Dicliptera magaliesbergensis (VU)
Drimia sanguinea (NT)
Euphorbia (all species, except E. ingens) – those recorded near to the site include **davyi**, duseimata, **hirta**, **inaequilatera**, indica, **prostrata**, **serpens**, **spartaria**
Pteridophyta, all species except Pteridium aquilinum
Frithia pulchra (rare)
Gladiolus filiformis (NT)
Gnaphalium nelsonii (NT)
Indigofera commixta
Kniphofia typhoides (NT)
Ledebouria atrobrunnea
Ledebouria confusa
Lessertia phillipsiana (DDD)
Lithops leslei subsp. leslei (NT)
Lobelia cuneifolia var. ananda (critically rare)
Miraglossum laeve (CR PE)
Nerine gracilis (VU)
Nuxia glomerulata
Rennera stellata (now Pentzia stellata) (NT)
Searsia maricoana (VU)
Senecio holubii (CR PE)
Spirostachys africana
Sporobolus oxyphyllus
Stenostelma umbelluliferum (NT)

Appendix 4: 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	
Clivia mirabilis	Oorlofskloof bush lily / Clivia
Haemanthus graniticus	April fool
Hessea pusilla	
Strumaria bidentata	
Strumaria perryae	
Family: ANACARDIACEAE	
Ozoroa spp.	All species
Family: APIACAEAE	
Centella tridentata	
Chamarea snijmaniae	
Family: APOCYNACEAE	
Hoodia gordonii	
Pachypodium namaquanum	Elephant's trunk
Family: ASPHODOLACEAE	
Aloe buhrii	
Aloe dichotoma	
Aloe dichotoma var. rumosissima	Maiden quiver tree
Aloe dabenorisana	
Aloe erinacea	
Aloe meyeri	
Aloe pearsonii	
Aloe pillansii	
Trachyandra prolifera	
Family: ASTERACEAE	
Athanasia adenantha	
Athanasia spathulata	
Cotula filifolia	
Euryops mirus	
Euryops rosulatus	
Euryops virgatus	
Felicia diffusa subsp. khamiesbergensis	
Othonna armiana	
Family: CRASSULACEAE	
Tylecodon torulosus	
Family: DIOSCORACEAE	
Dioscorea spp.	Elephant's foot, all species
Family: ERIOSPERMACEAE	
Eriospermum erinum	
Eriospermum glaciale	
Family: FABACEAE	
Amphithalea obtusiloba	
Lotononis acutiflora	
Lotononis polycephala	
Lessertia spp.	
Sceletium toruosum	
Sutherlandia 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	
Adiantium 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 *Aloe ferox***
Family: ASTERACEAE	
Helichrysum jubilatum	
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
Argyrolobium petiolare	
Caesalpinia bracteata	
Calliandra redacta	
Crotalaria pearsonii	
Indigofera limosa	
Lebeckia bowieana	
Polhillia involucrate	
Rhynchosia emarginata	
Wiborgia humilis	
Family: HYACINTHACEAE	
Daubenya spp	
Lachenalia spp.	**Daubenya, all species**
Veltheimia spp.	Viooltjie, all species
Eucomis spp.	Pineapple flower, all species
Neopatersonia 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

Appendix 5: Flora and vertebrate animal species protected under the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)

(as updated in R. 1187, 14 December 2007)

CRITICALLY ENDANGERED SPECIES

Flora

Adenium swazicum
Aloe pillansii
Diaphananthe millarii
Dioscorea ebutsniorum
Encephalartos aemulans
Encephalartos brevifoliolatus
Encephalartos cerinus
Encephalartos dolomiticus
Encephalartos heenanii
Encephalartos hirsutus
Encephalartos inopinus
Encephalartos latifrons
Encephalartos middelburgensis
Encephalartos nubimontanus
Encephalartos woodii

Reptilia

Loggerhead sea turtle
Leatherback sea turtle
Hawksbill sea turtle

Aves

Wattled crane
Blue swallow
Egyptian vulture
Cape parrot

Mammalia

Riverine rabbit
Rough-haired golden mole

ENDANGERED SPECIES

Flora

Angraecum africae
Encephalartos arenarius
Encephalartos cupidus
Encephalartos horridus
Encephalartos laevifolius
Encephalartos lebomboensis
Encephalartos msinganus
Jubaeopsis caffra
Siphonochilus aethiopicus
Warburgia salutaris
Newtonia hilderbrandi

Reptilia

Green turtle
Giant girdled lizard
Olive ridley turtle
Geometric tortoise

Aves

Blue crane
Grey crowned crane
Saddle-billed stork
Bearded vulture
White-backed vulture
Cape vulture
Hooded vulture
Pink-backed pelican
Pel's fishing owl
Lappet-faced vulture

Mammalia

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

VULNERABLE SPECIES

Flora

Aloe albida
Encephalartos cycadifolius
Encephalartos Eugene-maraisii
Encephalartos ngovanus
Merwilla plumbea
Zantedeschia jucunda

Aves

White-headed vulture
Tawny eagle
Kori bustard
Black stork
Southern banded snake eagle
Blue korhaan
Taita falcon
Lesser kestrel
Peregrine falcon

Bald ibis
Ludwig's bustard
Martial eagle
Bataleur
Grass owl

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

PROTECTED SPECIES
Flora
Adenia wilmsii
Aloe simii
Clivia mirabilis
Disa macrostachya
Disa nubigena
Disa physodes
Disa procera
Disa sabulosa
Encephelartos altensteinii
Encephelartos caffer
Encephelartos dyerianus
Encephelartos frederici-guilielmi
Encephelartos ghellinckii
Encephelartos humilis
Encephelartos lanatus
Encephelartos lehmannii
Encephelartos longifolius
Encephelartos natalensis
Encephelartos paucidentatus
Encephelartos princeps
Encephelartos senticosus
Encephelartos transvenosus
Encephelartos trispinosus
Encephelartos umbeluziensis
Encephelartos villosus
Euphorbia clivicola
Euphorbia meloformis
Euphorbia obesa
Harpagophytum procumbens
Harpagophytum zeyherii
Hoodia gordonii
Hoodia currorii
Protea odorata
Stangeria eriopus

Amphibia
Giant bullfrog
African bullfrog

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

Aves
Southern ground hornbill
African marsh harrier
Denham's bustard
Jackass penguin

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