



TERRESTRIAL BIODIVERSITY ASSESSMENT FOR THE PROPOSED BLACK MOUNTAIN MINING SANDGAT PROSPECTING RIGHT

**Khâi-Ma and Kai !Garib Local Municipalities, Z F
Mgcawu and Namakwa District Municipalities,
Northern Cape Province, South Africa**

07/05/2026

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

Report Name	TERRESTRIAL BIODIVERSITY ASSESSMENT FOR THE PROPOSED BLACK MOUNTAIN MINING SANDGAT PROSPECTING RIGHT	
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Declaration	<p>The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, Amended. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.</p>	

Table of Contents

1	Introduction.....	9
1.1	Background	9
1.2	Project Description	11
1.2.1	Description of the scope of the proposed overall activity.....	11
1.2.2	Description of planned non-invasive activities	11
1.2.3	Description of planned invasive activities	12
1.2.4	Phase 4: Boreholes	12
1.2.5	Phase 7: Boreholes	13
1.2.6	Phase 8: Boreholes	13
1.3	Scope of Work.....	14
1.4	Assumptions and Limitations	15
1.5	Key Legislative Requirements.....	16
2	Fieldwork	17
2.1	Biodiversity Field Assessment	17
2.2	Avifauna Field Assessment.....	17
3	Results & Discussion	19
3.1	Desktop Assessment	19
3.1.1	Ecologically Important Landscape Features	19
3.1.2	Flora Assessment.....	28
3.1.3	Fauna Assessment.....	33
3.2	Fieldwork Findings	37
3.2.1	Flora Assessment.....	37
3.2.2	Fauna Assessment.....	45
3.3	Habitat Assessment	50
3.4	Site Ecological Importance.....	59
3.4.1	Terrestrial Site Ecological Importance	59
3.4.2	Avifauna Site Ecological Importance.....	62
3.4.1	Desktop Ecological Sensitivity	65
3.4.2	Screening Tool Comparison.....	69
4	Impact Risk Assessment.....	72
4.1	Biodiversity Risk Assessment	72
4.2	Present Impacts to Biodiversity.....	72

4.3	Alternatives Considered	73
4.4	Irreplaceable Loss	73
4.5	Identification of Additional Potential Impacts	73
4.6	Quantitative Impact Assessment.....	74
4.6.1	Construction and Operational Phase	75
4.6.2	Decommissioning Phase.....	76
4.7	Cumulative Impacts.....	80
4.8	Biodiversity Management Objectives	81
4.9	Unplanned Events	81
4.9.1	Construction and Operational Phase	82
4.9.2	Decommissioning Phase.....	85
4.9.3	Generic Management Actions	86
5	Conclusion.....	88
5.1	Impact Statement	90
5.2	Specialist Opinion	90
6	References	92
7	Appendix Items.....	94
7.1	Appendix A: Methods	94
7.1.1	Desktop Dataset Assessment	94
7.1.2	Desktop Flora Assessment	98
7.1.3	Desktop Fauna Assessment	99
7.1.4	Vegetation & Flora Survey	100
7.2	Appendix B: Terrestrial Site Ecological Importance	101
7.3	Appendix D: Impact Assessment	105
7.4	Appendix E: Expected Species Lists	107
7.4.1	Expected Flora Species	107
7.4.2	Expected Mammal Species.....	114
7.4.3	Expected Reptile Species	114
7.4.4	Expected Amphibian Species	114
7.4.5	Expected Avifauna Species	115
7.5	Appendix F: Specialist Declaration of Independence	118
7.6	Appendix G: Specialist CVs	122

List of Tables

Table 1-1	A list of key legislative requirements	16
Table 1-2	Biodiversity Specialist Assessment information requirements as per the relevant protocol, including the location of the information within this report.....	16
Table 3-1	Summary of relevance of the proposed project to ecologically important landscape features	19
Table 3-2	Species that trigger the KBA	23
Table 3-3	List of expected flora Species of Conservation Concern. NT = Near Threatened, VU = Vulnerable, EN = Endangered, CR = Critically Endangered and DDD = Data Deficient Insufficient Information	32
Table 3-4	List of expected herpetofauna Species of Conservation Concern. NT = Near Threatened	33
Table 3-5	List of avifauna Species of Conservation Concern that may occur in the PAOI. CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern	34
Table 3-6	The flora species observed within the PAOI. VU = Vulnerable, EN = Endangered, LC = Least Concern and DDD = Data Deficient Insufficient Information	37
Table 3-7	Provincially Protected Species and Species of Conservation Concern recorded within the PAOI. VU = Vulnerable, EN = Endangered, LC = Least Concerned and DDD = Data Deficient Insufficient Information	41
Table 3-8	Summary of AIP recorded within the PAOI during the field survey period	43
Table 3-9	Proposed monitoring framework for the control of alien invasive plants within the PAOI.	44
Table 3-10	The mammal species observed within the PAOI.....	45
Table 3-11	Herpetofauna observed within the PAOI	46
Table 3-12	Table presenting the main avifauna species recorded from the PAOI.....	47
Table 3-13	Risk species observed in the PAOI for the prospecting	48
Table 3-14	Table providing descriptions of the habitat types delineated for the PAOI	51
Table 3-15	Summary of habitat types delineated within field assessment area from a terrestrial, flora and fauna perspective (excluding avifauna).....	60
Table 3-16	Avifauna sensitivities for all the various habitats	62
Table 3-17	Summary of the screening tool vs specialist assigned sensitivities for the proposed project. 69	
Table 4-1	Summary of potential impacts to biodiversity associated with the proposed activity.....	74
Table 4-2	Impacts to biodiversity associated with the proposed activity in the operational phase and decommissioning phases	77
Table 4-3	The cumulative impacts considered for the project.....	80
Table 4-4	Summary of unplanned events for terrestrial biodiversity	81

Table 4-5	Summary of management objectives pertaining to impacts to habitats and vegetation associated with the proposed development during the construction and operational phases	82
Table 4-6	Summary of management objectives pertaining to impacts caused by alien and invasive vegetation associated with the proposed development during the construction and operational phases	83
Table 4-7	Summary of management objectives pertaining to impacts to fauna associated with the proposed development during the construction and operational phases	83
Table 4-8	Summary of management objectives pertaining to rehabilitation of habitats associated with the proposed development during the decommissioning phase	85
Table 4-9	Summary of the generic management objectives associated with the proposed development	86
Table 5-1	Table presenting the habitats within the PAOI and their respective sensitivities	88
Table 7-1	Summary of the Mining and Biodiversity Guidelines	97
Table 7-2	Summary of Conservation Importance (CI) criteria	101
Table 7-3	Summary of Functional Integrity (FI) criteria	102
Table 7-4	Matrix used to derive Biodiversity Importance (BI) from Functional Integrity (FI) and Conservation Importance (CI)	102
Table 7-5	Summary of Receptor Resilience (RR) criteria	103
Table 7-6	Matrix used to derive Site Ecological Importance from Receptor Resilience (RR) and Biodiversity Importance (BI)	103
Table 7-7	Guideline for interpreting Site Ecological Importance in the context of proposed activities	104
Table 7-8	Criteria for Determining Impact Consequence	105
Table 7-9	Environmental Significance Rating	106

List of Figures

Figure 1-1	Map illustrating the regional context of the project	10
Figure 1-2	Map illustrating the details of the Project Area of Influence (PAOI)	10
Figure 1-3	Proposed Project deposits and prospects	14
Figure 2-1	Map illustrating the field survey tracks.....	17
Figure 2-2	Map illustrating the point count locations and tracks for the avifauna assessment	18
Figure 3-1	Map illustrating the ecosystem threat status associated with the PAOI	20
Figure 3-2	Map illustrating the ecosystem protection level associated with the PAOI	21
Figure 3-3	Map illustrating the PAOI in relation to the Northern Cape Biodiversity Sector Plan	22
Figure 3-4	The PAOI in relation to the KBA dataset	24
Figure 3-5	Map illustrating the PAOI in relation to the South African Inventory of Inland Aquatic Ecosystems dataset	25
Figure 3-6	Map illustrating the PAOI in relation to the National Freshwater Ecosystem Priority Area dataset	26
Figure 3-7	Map illustrating the PAOI and inferred reserves in relation to the Mining and Biodiversity Guidelines.....	27
Figure 3-8	Map illustrating the vegetation types associated with the PAOI.....	31
Figure 3-9	Photographs illustrating some of the indigenous species recorded from the PAOI: A – <i>Lycium cinereum</i> , B – <i>Eragrostis nindensis</i> , C – <i>Rhigozum trichotomum</i> , D – <i>Anacampseros papyracea</i> , E – <i>Moraea venenata</i> , and F – <i>Schmidtia kalahariensis</i>	40
Figure 3-10	Photographs illustrating some of the flora SCC recorded from the PAOI: A – <i>Anacampseros quinarian</i> , B – <i>Aloidendron dichotomum</i> and C – <i>Hoodia gordonii</i>	42
Figure 3-11	Some of the mammal species observed within the PAOI: A – <i>Micaelamys namaquensis</i> , B – <i>Lepus saxatilis</i> , C – <i>Antidorcas marsupialis</i> , D – <i>Suricata suricata</i> E – <i>Cynictis penicillata</i> , F – <i>Otocyon megalotis</i> and G – <i>Orycteropus afer</i>	45
Figure 3-12	Some of the herpetofauna species observed within the PAOI: A – <i>Pedioplanis lineocellata</i> , B – <i>Trachylepis sulcata</i> , C – <i>Psammophis notostictus</i> , D – <i>Psammobates tentorius</i> subsp. <i>verroxi</i> , E – <i>Pyxicephalus adspersus</i> and F – <i>Chondrodactylus bibronii</i>	46
Figure 3-13	Column plot illustrating the proportion of each Functional Feeding Guild to the total abundance. Avifaunal trophic guilds – CGD, carnivore ground diurnal; CGN, carnivore ground nocturnal; CWD, carnivore water diurnal; CWN, carnivore water nocturnal; CFD, carnivore foliage diurnal; CAD, carnivore air nocturnal; FFD, frugivore foliage diurnal; GGD, granivore ground diurnal; GWD, granivore water diurnal; GFD, granivore foliage diurnal; HGD, herbivore ground diurnal; HWD, herbivore water diurnal; IGD, invertivore ground diurnal; IWD, invertivore, water diurnal; IGN, invertivore ground nocturnal; IFD, invertivore foliage diurnal; IPD, invertivore perch diurnal; IPN, invertivore perch nocturnal; IAD, invertivore air diurnal; IAN, invertivore air nocturnal; NFD, nectivore foliage diurnal; OGD, omnivore ground diurnal; OWD, omnivore water diurnal; OFD, omnivore foliage diurnal.	49
Figure 3-14	Map of the habitats delineated for the PAOI	50

Figure 3-15	Site Ecological Importance of the PAOI for terrestrial (excluding avifauna)	62
Figure 3-16	Site Ecological Importance of the PAOI for avifauna	65
Figure 3-17	Terrestrial Biodiversity Theme sensitivity for the PAOI	66
Figure 3-18	Relative Plant Species Theme Sensitivity for the PAOI	67
Figure 3-19	Relative Animal Species Theme Sensitivity for the PAOI	68
Figure 4-1	Photographs illustrating some of the current negative impacts associated within the PAOI: A) Livestock grazing and overgrazing, B) Existing powerlines, C) Roads and D) Agriculture (livestock farming).....	73
Figure 4-2	Cumulative habitat loss in 30 km surrounding the PAOI	81
Figure 5-1	Map illustrating the Terrestrial Site Ecological Importance of the PAOI including the outcrop no – go buffers	90
Figure 7-1	Map illustrating the extent of area used to obtain the expected flora and fauna species list from the GBIF database.	99

1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake a Terrestrial Biodiversity and Avifauna Assessment for the proposed Black Mountain Mining Sandgat Prospecting Right located in the Khâi-Ma and Kai !Garib Local Municipalities, Z F Mgcawu and Namakwa District Municipalities, Northern Cape Province, South Africa. The provided assessment area will be referred to as the Project Area of Influence (PAOI) for reporting purposes. A map presenting the regional context of the project can be seen in Figure 1-1. A map presenting the PAOI can be seen in Figure 1-2.

The National Web based Environmental Screening Tool has characterised the specialist themes as follows for the PAOI:

- Terrestrial Biodiversity Theme – Very High Sensitivity;
- Plant Species Theme – Medium Sensitivity; and
- Animal Species Theme – High Sensitivity.

Accordingly, this assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations, 2014 as amended 2020 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) amended March 2022 (NEMA). The approach has taken cognisance of the recently published Government Notices (GN) 320 (20 March 2020) and GN 1150 (30 October 2020): “Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation” (Reporting Criteria).

The purpose of the specialist studies is to provide relevant input into the impact assessment process and to provide a report for the proposed activities associated with the development. This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making as to the ecological viability of the proposed project.

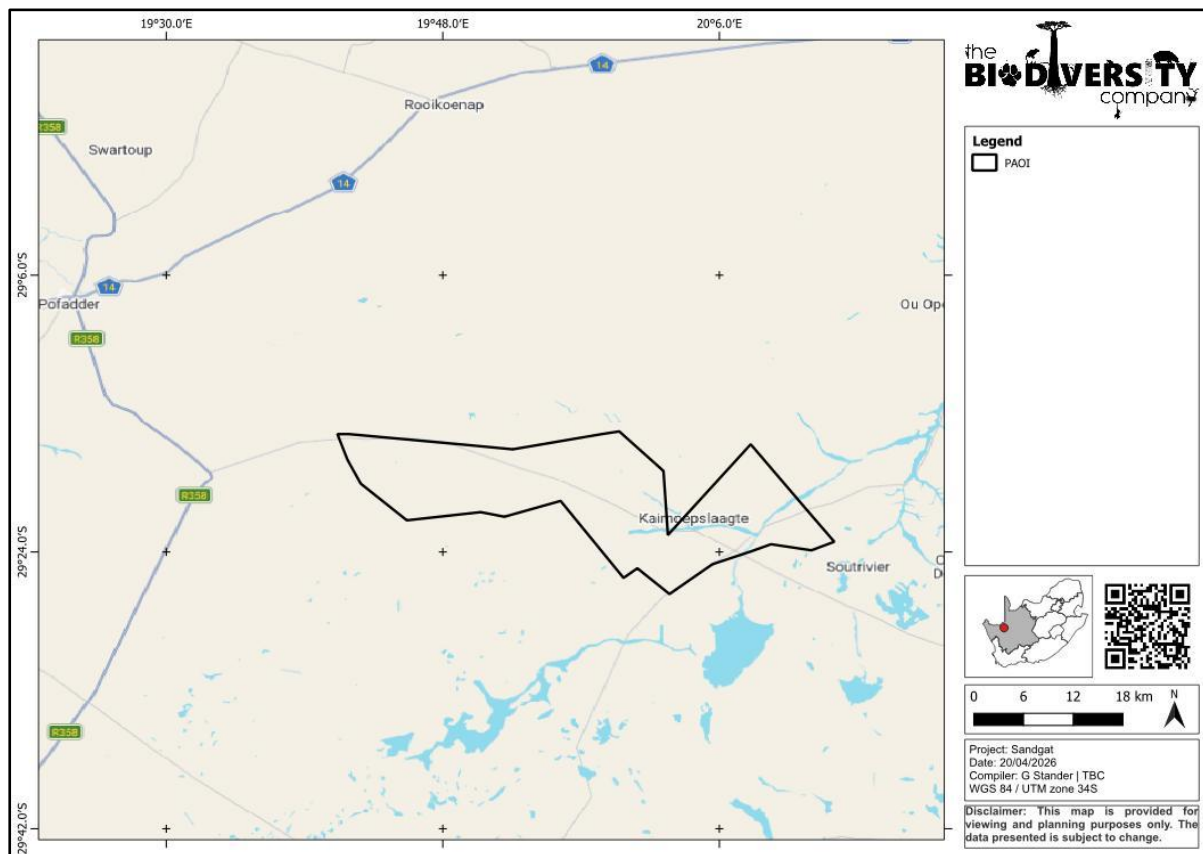


Figure 1-1 Map illustrating the regional context of the project

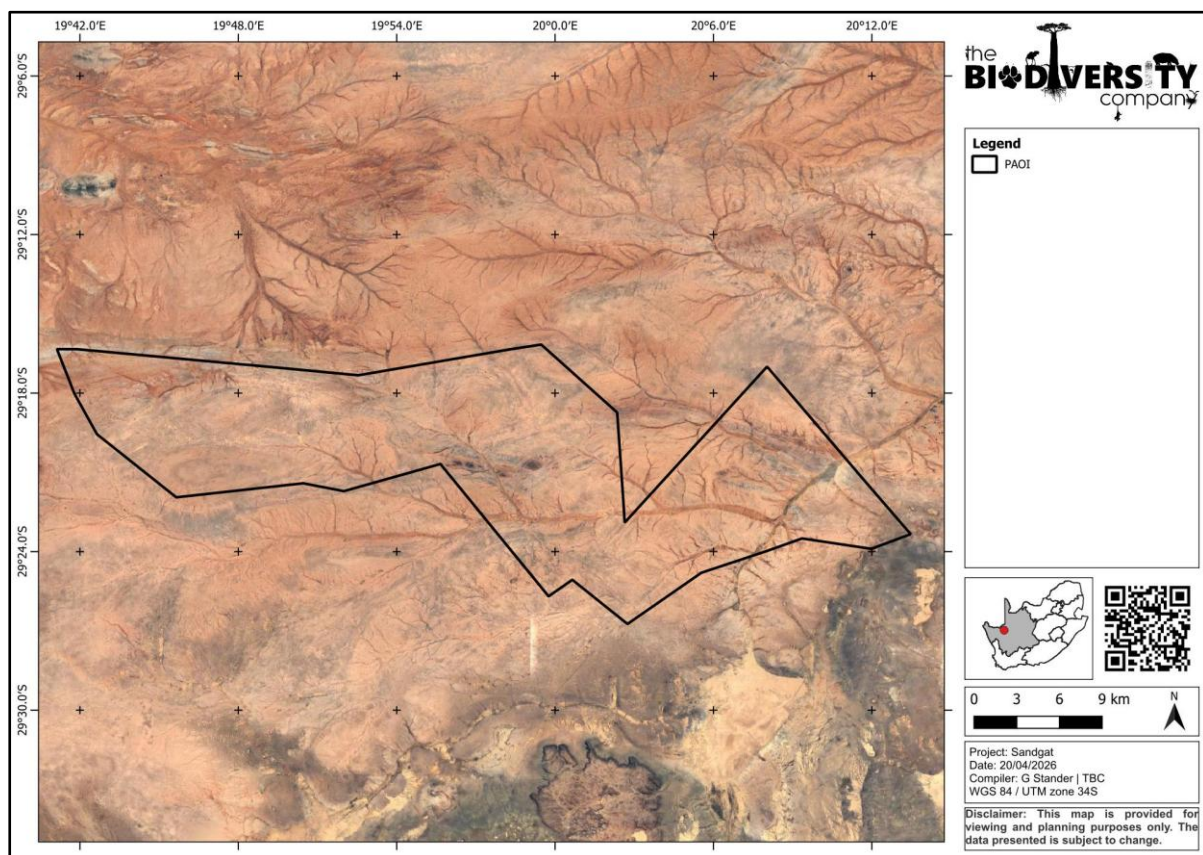


Figure 1-2 Map illustrating the details of the Project Area of Influence (PAOI)

1.2 Project Description

1.2.1 Description of the scope of the proposed overall activity

Both non-invasive and invasive prospecting activities will be undertaken as part of the proposed Prospecting Work Programme (PWP). The application will follow a phased approach, where the prospecting work program is divided into several sequential phases.

Figure 1-3 below depicts the proposed prospecting area, the proposed areas of interest within the application area will be defined within the course of prospecting activities. This application employs a phased approach, where the work program is divided into several sequential sections. At the end of each section there will be a period of compiling, evaluating and reporting results. These results will not only determine whether the project proceeds, but also the manner in which it will go forward. Essentially, BMM will only action the next phase once satisfied with the results obtained. It is not possible to give details of the drilling program before the surveys and surface work phase 1 is completed. In the event that more information becomes available or that an ore body is located at an earlier stage, then an amended program will be put forward for the DMPP's approval.

It is anticipated that the invasive program will consist of a number of boreholes / drill sites with a footprint of approximately 300 m² each. Vegetation will be cleared at the borehole locations within the application area. Minor access tracks will be created to access the proposed borehole sites where there are no existing roads. The total length of the access routes is anticipated to be 5 000 m and the approximate width is 3m. The targeting of all drilling activities will be dependent on the results obtained during the preceding phases of prospecting, namely the geological mapping and geophysical surveying and as such it is currently not possible to include a finalised surface plan showing the intended location, extent and depth of boreholes to be completed.

No bulk sampling work is to be carried out during this prospecting program. Initial prospecting will be carried out by BMM itself, utilising its own in-house geologists to conduct and oversee the work. Drilling will be outsourced to a local drilling company. The methods detailed below will be used to investigate the prospecting area.

It is hereby noted that the different phases and timeframes of the prospecting herein envisaged are, by their nature, dependent on the results obtained during the preceding phases of such prospecting. The proposals set out in this Prospecting Work Programme are therefore made on the basis that results obtained during the preceding phases may necessitate reasonable changes and adaptations to such proposals, which will be reported as prescribed.

1.2.2 Description of planned non-invasive activities

These activities do not disturb the land where prospecting will take place e.g., aerial photography, desktop studies, aeromagnetic surveys, etc.

1.2.2.1 Phase 1: Desktop study

To include:

- Compilation of historical exploration data with the aim of developing a working plan of the prospecting area on a suitable scale (1:5,000 or 1:10,000).
- Analysis of existing data and maps to further understand prospecting area structure & geology
- Initial targeting and ranking of prospective areas

1.2.2.2 Phase 2: Geological field mapping

The field mapping will be focused on potentially prospective areas (Bushmanland Group rocks) to improve understanding of the structure & geology in order to define targets for ground-based geophysics as well as to be able to interpret geophysical results. Geological mapping will be on a scale suitable for the observed geological variability and will be conducted by an in-house well-trained and highly experienced geologist.

During the geological field mapping activity soil and litho-sampling along with analysis (XRF & or assaying) may be conducted to determine prospective horizons.

1.2.2.3 Phase 3: Semi-Regional Geophysical Survey (ground based)

The primary ground-based geophysical technique that will be employed will be time-domain electromagnetics (TDEM) utilizing a new state-of-the-art SQUID electromagnetic sensor. Existing airborne EM and aeromagnetic coverage will guide the ground follow-up strategy. Additional techniques, such as controlled source audio magnetotellurics (CSAMT) and direct current resistivity / induced polarization, might be employed over prospective targets.

1.2.3 Description of planned invasive activities

These activities result in land disturbances e.g. sampling, drilling, bulk sampling, etc.

1.2.3.1 Drilling

The targeting of all drilling activities will be dependent on the results obtained during the preceding phases of prospecting, namely the geological mapping and geophysical surveying and as such it is currently not possible to include a finalized surface plan showing the intended location, extent and depth of boreholes to be completed.

Diamond drilling will be of the standard HQ or NQ size. Down hole surveys will be done every 50m in each hole. Core will be marked, logged, photographed and sampled according to the standard of the applicant's logging and sampling procedures.

Down the hole geophysical surveying will take place upon completion of the exploratory boreholes along with Ground EM surveys to determine positions of conductors.

Rehabilitation of drill sites will be done according to an approved Environmental Management Plan.

Percussion Rotary Air Blast (RAB) or Reverse Circulation (RC) drilling may be carried out for pre-collaring of diamond drill boreholes or for obtaining samples if significant depth of cover is encountered over particular targets.

1.2.3.2 Assaying

Rock chip / soil samples will be sent to a laboratory of the applicant's choice to be crushed, split, pulverized and assayed. Samples from core will be split using a core cutter before being sent to the laboratory for analysis.

1.2.3.3 Metallurgical Test Work

Metallurgical test work would start during phase 7 of the prospecting work programme. These tests will be done by and in consultation with a preferred and accredited Laboratory of the applicant's choice.

1.2.4 Phase 4: Boreholes

The initial planned invasive exploration activities will consist of diamond drill boreholes drilled to appropriate depths to target any anomalies identified during Phases 2 and 3 of the non-invasive portion of the prospecting work plan. The work will consist of:

- Access and drill site preparation
- Diamond core drilling
- Sampling and assaying
- Quality assurance and quality control programs
- Down hole geophysics
- Rehabilitation of drill sites
- Recording and Integration of data

1.2.5 Phase 7: Boreholes

This phase of boreholes would determine the continuity of mineralization and potential deposit size. The work will consist of:

- Access and drill site preparation
- Widely spaced diamond drilling and analyses to confirm grade / tonnage potential
- Sampling and assaying
- Quality assurance and quality control programs
- Metallurgical test work
- Rehabilitation of drill sites
- Recording and Integration of data

1.2.6 Phase 8: Boreholes

This phase of boreholes would provide enough information to be able to calculate an inferred resource. The work would consist of:

- Access and drill site preparation
- Close spaced infill diamond drilling and analyses to determine actual grade / tonnage
- Sampling and assaying
- Quality assurance and quality control programs
- Metallurgical test work
- Geotechnical drilling program
- Rehabilitation of drill sites
- Recording & Integration of data

Only the mineral deposit of the area was provided as shown below;

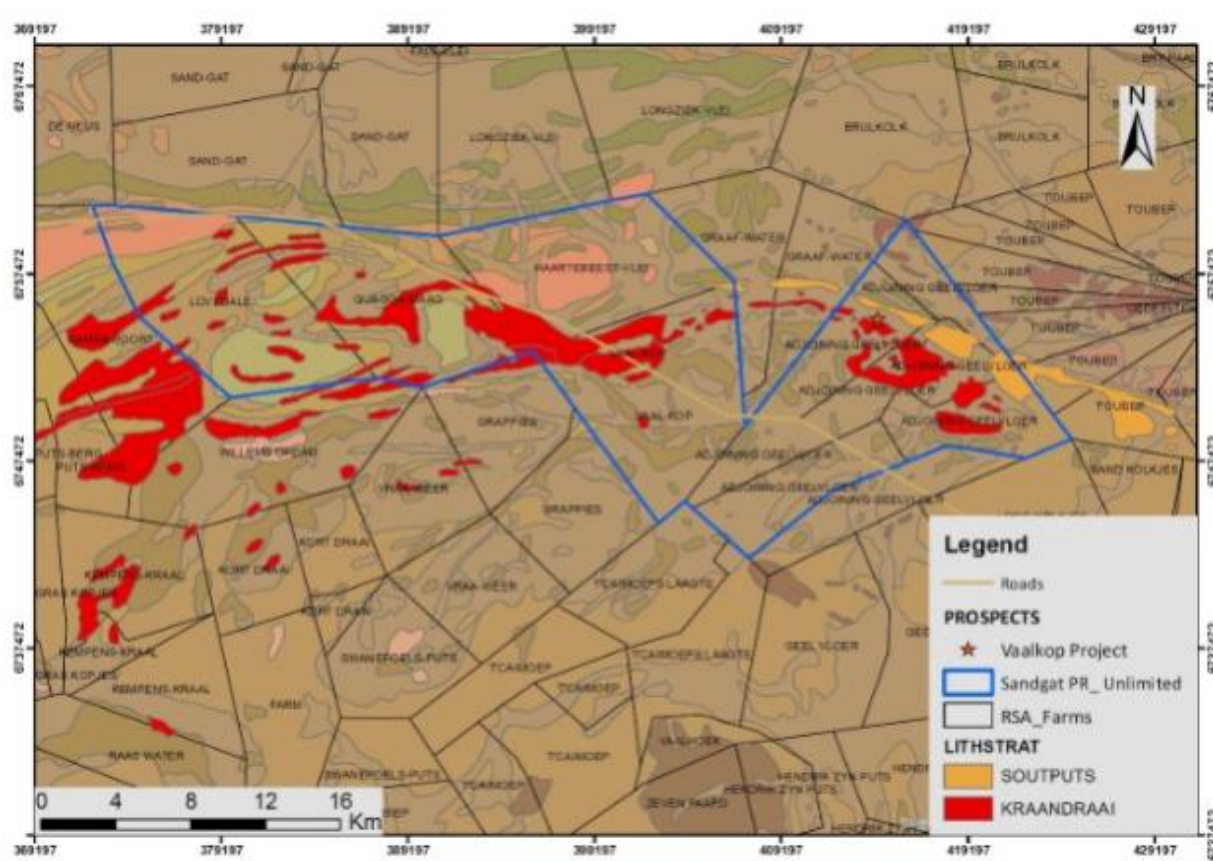


Figure 1-3 Proposed Project deposits and prospects

1.3 Scope of Work

The aim of the biodiversity assessment was to provide information to guide the risk of the proposed activity to the current state of the associated ecosystems within the development area. This was achieved through the following:

- Desktop assessment to identify the relevant ecologically important geographical features within the PAOI and surrounding landscape;
- Desktop assessment to compile an expected species list and identify possible Species of Conservation Concern (SCC) that occur within the PAOI and surrounding landscape;
- Field survey to record flora and fauna species, especially SCC;
- Field work to determine the density and composition of species in the PAOI;
- Description of the baseline avifauna species and Functional Feeding Guild (FFG) composition assemblage within the PAOI;
- Determination of the Site Ecological Importance (SEI), also commonly referred to as sensitivity;
- A biodiversity and avifauna impact assessment; and
- The prescription of mitigation measures for identified risks, including assigning buffer areas, where necessary.

1.4 Assumptions and Limitations

The following assumptions and limitations are applicable to this assessment:

- It is assumed that all information received from the client/developer is accurate;
- All datasets accessed and utilised for this assessment are considered to be representative of the most recent and suitable data for the intended purposes;
- The assessment area (PAOI) was based on the footprint areas as provided by the client, and any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and hence the results of this assessment;
- This assessment does not consider temporal trends;
- This assessment only considers non-volant mammals, avifauna, reptiles and amphibians. Bats and invertebrates were not assessed;
- Both the Terrestrial biodiversity and avifaunal site surveys were conducted on 13th to the 16th of April 2026. One (1) single season site survey was conducted, which constitutes a late wet-season survey and is considered sufficient to derive a meaningful baseline of the PAOI;
- Due to the high likelihood of occurrence of avifauna species of conservation concern, a nest walkdown is recommended in conjunction with the plant walkdown;
- The nest walkdown could be more targeted should the drill site locations be made available;
- This report is only relevant to prospecting and not mining activities;
- Exact drill sites (or associated layout) were not known at the time of completion of this report;
- Access limitations, including locked gates and denied access by landowners, prevented certain sections of the PAOI from being assessed in the field. These areas were therefore evaluated primarily using desktop information and satellite imagery, with assumptions informed by the surrounding areas that were assessed, as well as prior knowledge of the broader landscape;
- Given the extent of the PAOI, as well as access and time constraints, the habitat assessment focused on identifying the major habitat types. The habitat assessment should therefore be interpreted in this context;
- This survey must be followed by a terrestrial biodiversity walkdown to inform micro-siting, and a flora search and rescue plan of the development footprint, both conducted during the correct flowering season for the biome;
- Whilst every effort was made to cover as much of the PAOI as possible within the constraints of time, site access, and the availability of drivable roads, representative sampling was completed, and by its nature it is possible that some plant and animal species that are present within the PAOI were not recorded during the field investigations; and
- The Global Positioning System (GPS) used in the assessment has an accuracy of 5 m and consequently any spatial features may be offset by up to 5 m.

1.5 Key Legislative Requirements

The legislation, policies and guidelines listed below in Table 1-1 are applicable to the current project. The list below, although extensive, may not be complete and other legislation, policies and guidelines may apply in addition to those listed below.

Table 1-1 A list of key legislative requirements

Region	Legislation / Guideline	Comment
National	The National Environmental Management Act (NEMA) (Act No. 107 of 1998)	Environmental Impact Assessment Regulations. 2014 (GNR 326, 7 April 2017 amended March 2022), Appendix 6 requirements
	The National Environmental Management: Biodiversity Act (Act No. 10 of 2004), Threatened or Protected Species Regulations	The protection of species and ecosystems that warrant protection
	Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, GNR 320 of Government Gazette 43310 (March 2020)	The minimum criteria for reporting.
	Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, GNR 1150 of Government Gazette 43855 (October 2020)	Protocol for the specialist assessment and minimum report content requirements.
	The National Environmental Management: Waste Act, 2008 (Act 59 of 2008);	The regulation of waste management to protect the environment.
	National Water Act (NWA) (Act No. 36 of 1998)	The regulation of water uses.
	Alien and Invasive Species Regulations and, Alien and Invasive Species List 2014/2020, published under NEMBA	The regulation and management of alien invasive species.
Provincial	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA)	To provide for control over the utilization of the natural agricultural resources including the vegetation and the combating of weeds and invader plants.
	Northern Cape Planning and Development Act no. 7 of 1998	To provide for the management and conservation of the province's biophysical environment and protected areas.
	Northern Cape Nature Conservation Act No. 9 of 2009	To inform land use planning, environmental assessments, land and water use authorisations, as well as natural resource management,

A Biodiversity Specialist Assessment Report must contain the information as presented in Table 1-2 below.

Table 1-2 Biodiversity Specialist Assessment information requirements as per the relevant protocol, including the location of the information within this report

Information to be Included (as per GN 320, 20 March 2020)	Report Section
Methodology used to undertake the site assessment and survey, and prepare the assessment, including relevant equipment and modelling used	7.1
A statement on the duration, date, and season of the site inspection	2
Description of the assumptions and any uncertainties or gaps in knowledge or data	1.4
A baseline profile description of biodiversity and ecosystems of the site	3.1.1
Site sensitivity verification: Desktop Analysis using satellite imagery and available information	3.4.1
Site sensitivity verification: Onsite inspection, including a description of current land use and vegetation found on-site	3.4.1 and 3.4.2

Sandgat Prospecting Right

Site sensitivity verification: Photographs/evidence of environmental sensitivity	3.2.1 and 3.2.2 and 3.3
Screening tool confirmation/dispute: The assessment must verify the sensitivity of the site, in terms of plant, animal, and terrestrial biodiversity themes	3.4.2
Indicate whether the proposed development will have any impact on the terrestrial environment, animals and/or plants	4.6
Proposed impact management outcomes or monitoring requirements for inclusion in the EMPr	4.9.3
A signed statement of independence by the specialist	7.5
Specialist details, including a CV	7.6

2 Fieldwork

2.1 Biodiversity Field Assessment

One (1) late wet season field survey was undertaken for the project from the 13th to the 16th of April 2026 to confirm the presence of Species of Conservation Concern (SCC), as well as any sensitive habitat features. Effort was made to cover all the different habitat types within the limits of time and access. During the survey, notes were made regarding current impacts, recording of dominant vegetation species and any sensitive or important features (e.g., drainage lines, rock outcrops, termite mounds etc.). A map presenting the field survey tracks from the field survey can be seen in Figure 2-1.

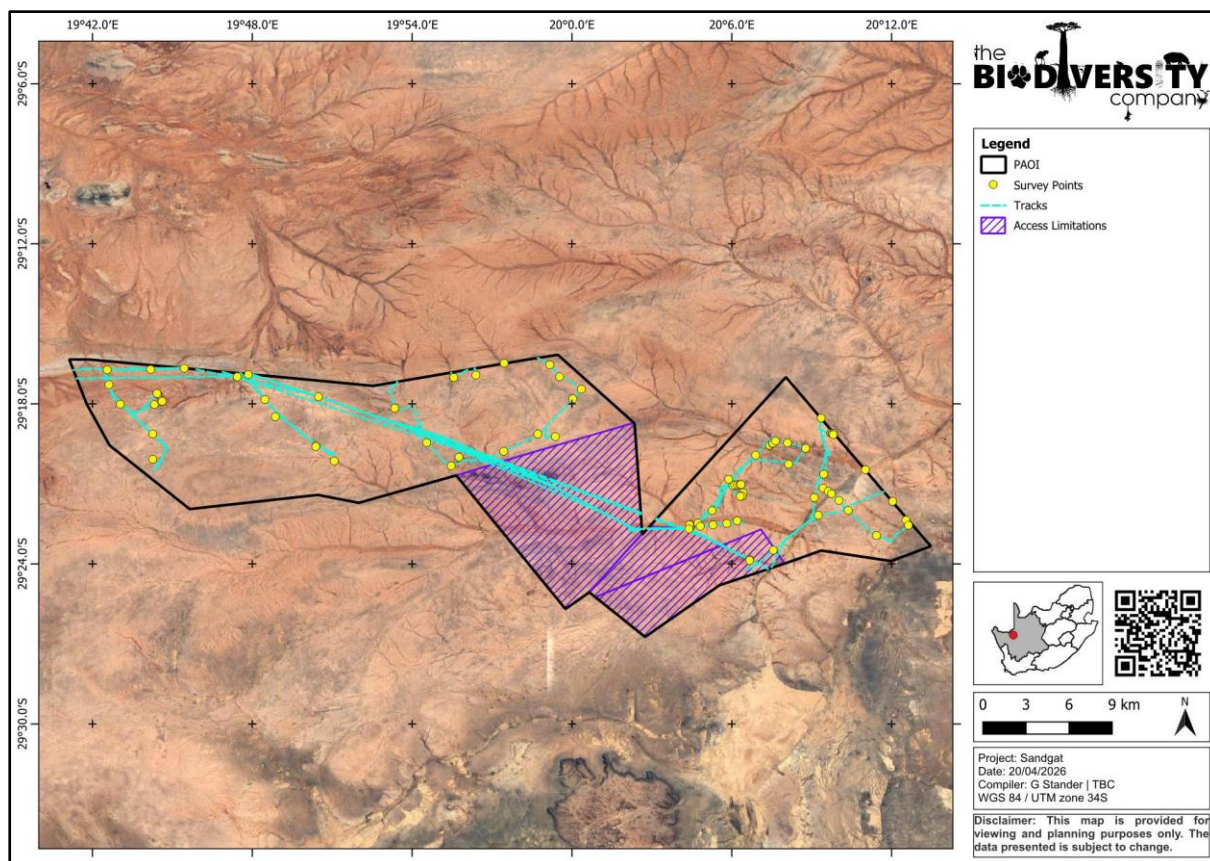


Figure 2-1 Map illustrating the field survey tracks

2.2 Avifauna Field Assessment

One (1) avifaunal field survey was completed from the 13th to the 16th of April 2026.

Point Counts

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Standardised point counts (Buckland *et al.*, 1993) were conducted to gather data on the species composition and relative abundance of species within the broad habitat types identified. The standardised point count technique was utilised as it was demonstrated to outperform line routes (Cumming & Henry, 2019). Each point count was conducted over a 10-minute period. The horizontal detection limit was set at 150 meters. At each point, the observer would document the date, start time, end time, habitat, numbers of each species, detection method (seen or heard), behaviour (perched or flying), and general notes on habitat and nesting suitability for conservation-important species.

Nest Survey

Possible nesting sites such as power lines, stands of trees, marshes and drainage lines, cliffs, and gravel areas were surveyed for nests. All breeding sites were mapped, and the activity at the nests was assessed during all the surveys.

Incidental Observations

To supplement the species inventory with cryptic and elusive species that may not be detected during the rigid point count and drive transect protocols, diurnal incidental searches were conducted. This involved the opportunistic sampling of species between point count periods as well as random meandering.

Figure 2-2 shows the point count locations and tracks of the field observer.

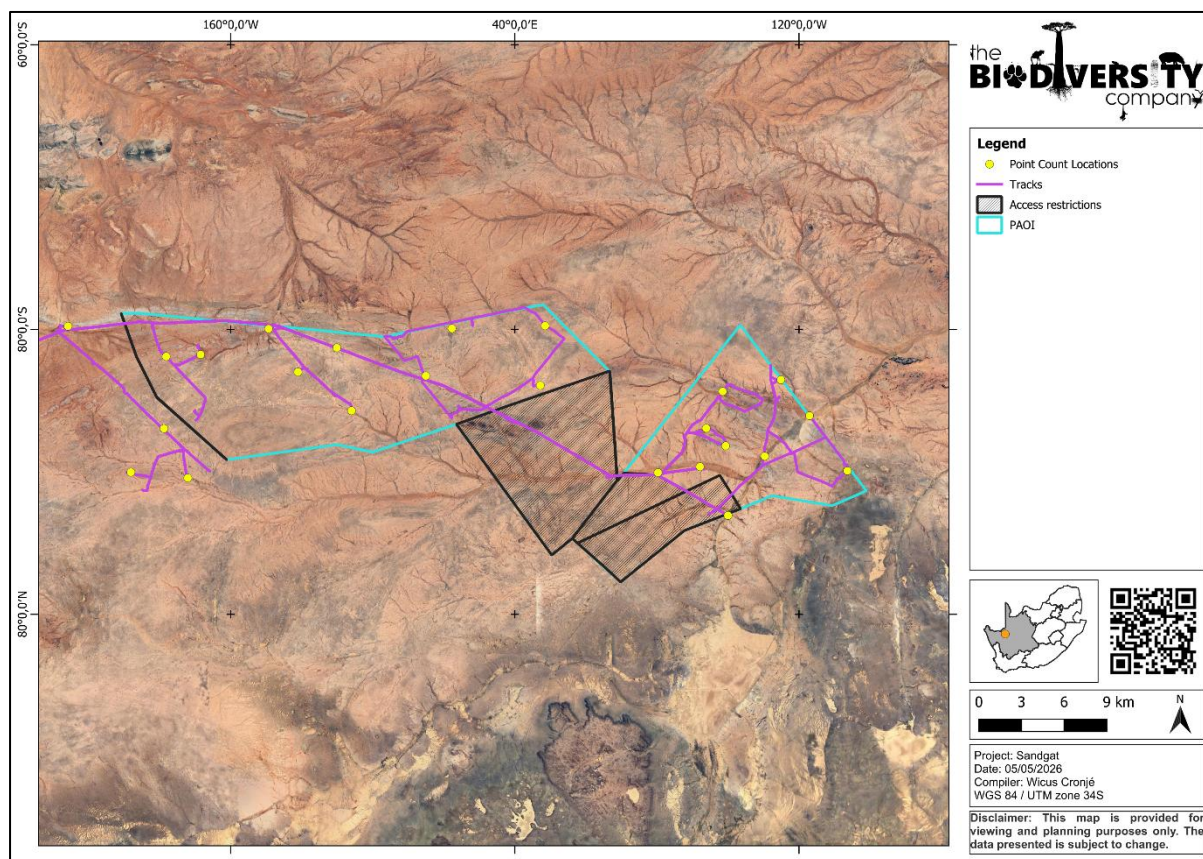


Figure 2-2 Map illustrating the point count locations and tracks for the avifauna assessment

3 Results & Discussion

3.1 Desktop Assessment

3.1.1 Ecologically Important Landscape Features

The relevance of the proposed development to ecologically important landscape features are summarised in Table 3-1.

Table 3-1 *Summary of relevance of the proposed project to ecologically important landscape features*

Desktop Information Considered	Relevance	Reasoning	Section
Ecosystem Threat Status – Red List of Ecosystems (RLE)	Relevant	The PAOI overlaps with Least Concern (LC) ecosystems (RLE, 2022).	3.1.1.1
Ecosystem Protection Level	Relevant	The PAOI overlaps with Not Protected (NP) ecosystem (NBA, 2018).	3.1.1.2
Provincial Conservation Plan	Relevant	The PAOI overlaps with Critical Biodiversity Area (CBA) 1 and CBA 2. The reasons include vegetation type target, threatened bird's habitat, threatened rivers, wetland river target, and other rivers target.	3.1.1.3
National Protected Areas Expansion Strategy (NPAES)	Irrelevant	The PAOI does not overlap with any NPAES Priority Focus Areas (NPAES, 2018).	-
South Africa Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD)	Irrelevant	No SAPAD or SACAD sites occur within 5 km of the PAOI	-
Key Biodiversity Areas (KBA)	Relevant	The PAOI is located within 5 km of the Aggenys-Pella-Pofadder KBA (KBA, 2024)	3.1.1.4
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	Relevant	The PAOI overlaps with the Endangered (EN) Kaboep and Soutputs se Laagte rivers, as well as Critically Endangered (CR) Depression wetlands and unassessed rivers (NBA, 2018).	3.1.1.4
National Freshwater Ecosystem Priority Area (NFPEA)	Relevant	The PAOI overlaps with Non – priority wetlands (Seep, Flat, Depression), the Kaboep, Koeiamlaagte, Steenkampvlei se Holte and Soutputs se Laagte rivers which are all classified as Class B: Largely Natural River.	3.1.1.6
Strategic Water Source Areas (SWSA)	Irrelevant	The PAOI does not overlap with any relevant areas.	-
Mining and Biodiversity Guidelines	Relevant	Overlaps with areas of Moderate and Highest Biodiversity Importance (BI) with corresponding Moderate and Highest risk for mining (2013).	3.1.1.7
Coordinated Water Bird Count (CWAC)	Irrelevant	No CWAC areas are located within 5 km of the PAOI.	-
Coordinated Avifaunal Road Count (CAR)	Irrelevant	No CAR routes are located within 5 km of the PAOI	-

3.1.1.1 Red List of Ecosystems

The Ecosystem Threat Status is an indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition.

According to the Red List of Ecosystems dataset (Skowno & Monyeki, 2021) the PAOI overlaps with LC ecosystems (Figure 3-1).

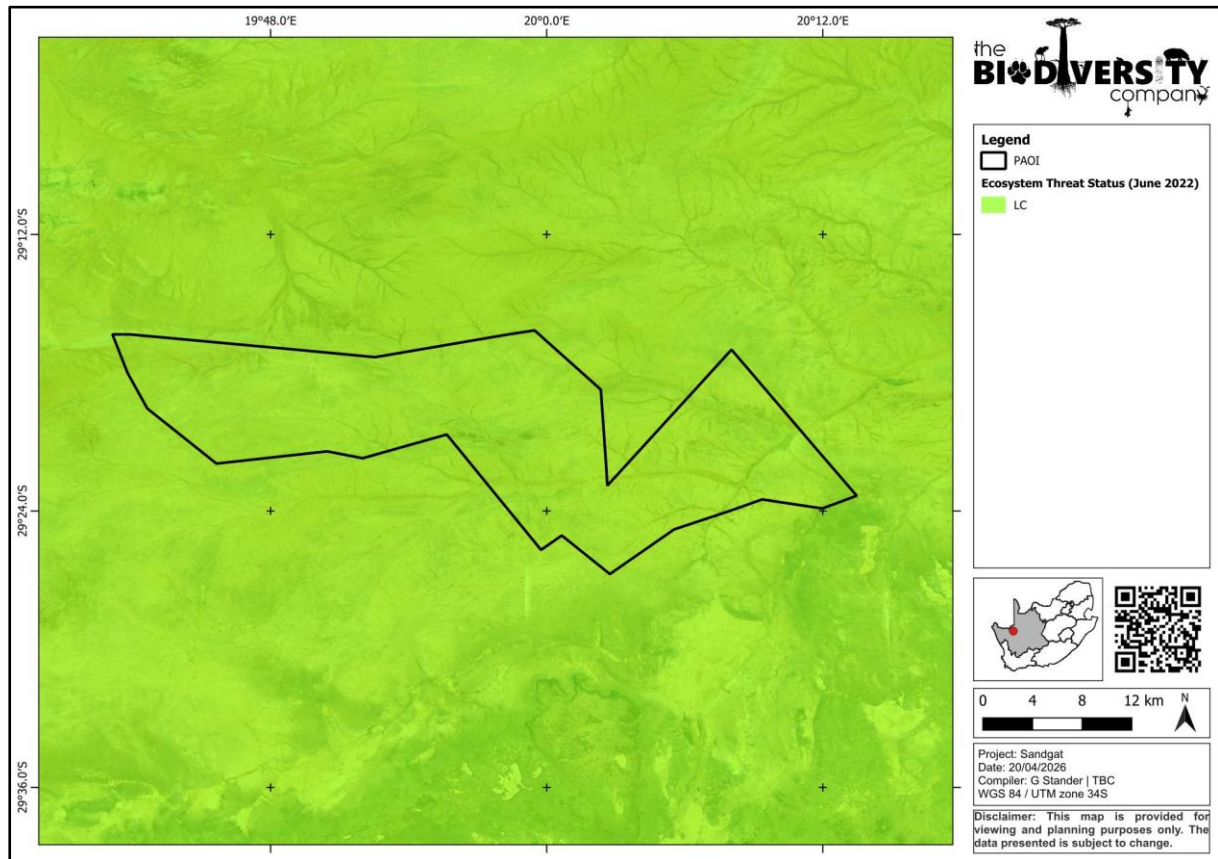


Figure 3-1 Map illustrating the ecosystem threat status associated with the PAOI

3.1.1.2 Ecosystem Protection Level

Indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. Not Protected, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.

The PAOI overlaps with a NP ecosystem (Figure 3-2).

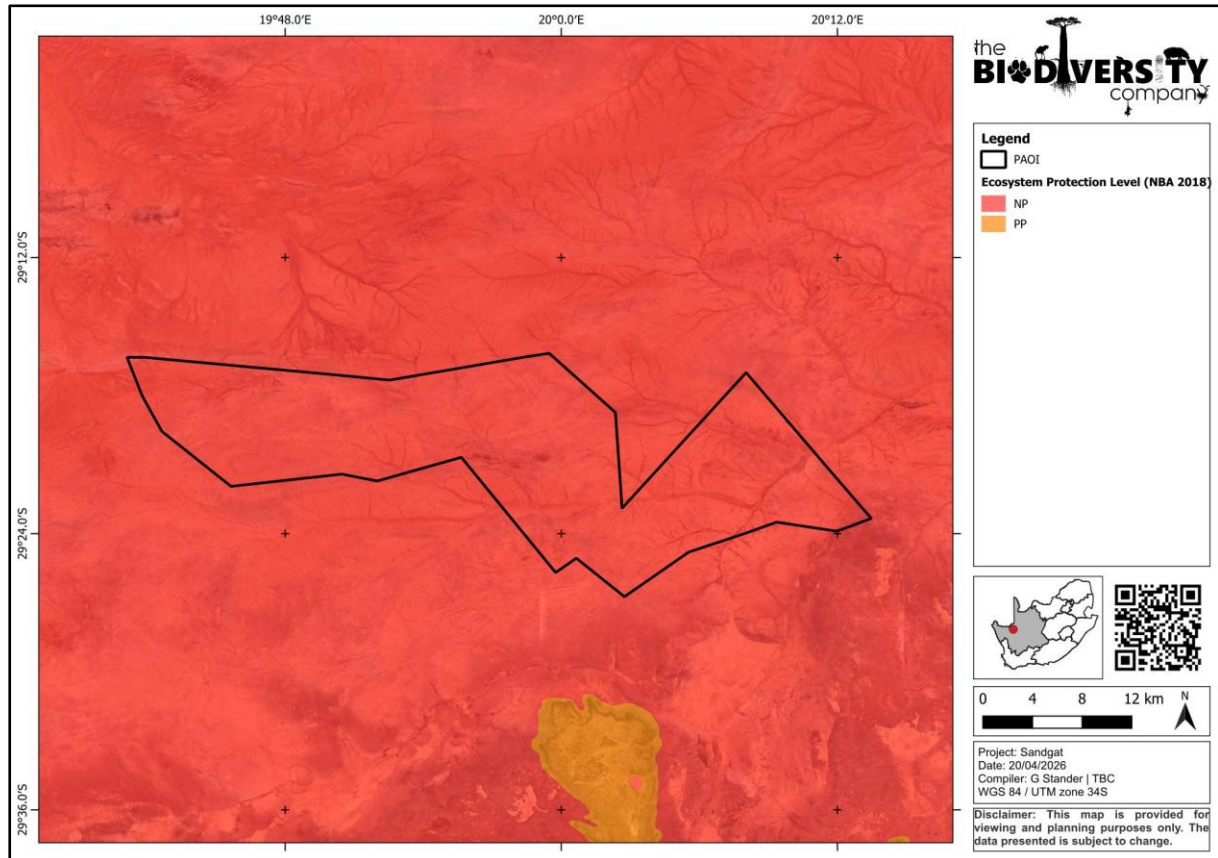


Figure 3-2 Map illustrating the ecosystem protection level associated with the PAOI

3.1.1.3 Provincial Conservation Plan

The Northern Cape Biodiversity Spatial Plan (NCBSP) (2024), developed by the Northern Cape Department of Environment and Nature Conservation (DENC) in collaboration with SANBI, provides the latest spatial framework for biodiversity conservation in the province. This plan updates and replaces the 2016 Northern Cape CBA Map, aiming to guide sustainable land use and inform environmental decision-making in line with national biodiversity legislation.

The BSP defines the following categories: Protected Areas, Critical Biodiversity Areas (CBA), subdivided into CBA 1 and CBA 2, and Ecological Support Areas (ESA).

According to the Northern Cape BSP, the PAOI overlaps with CBA 1 and CBA 2 (Figure 3-3). The reasons include vegetation type target, threatened bird's habitat, threatened rivers, wetland river target, and other rivers target.

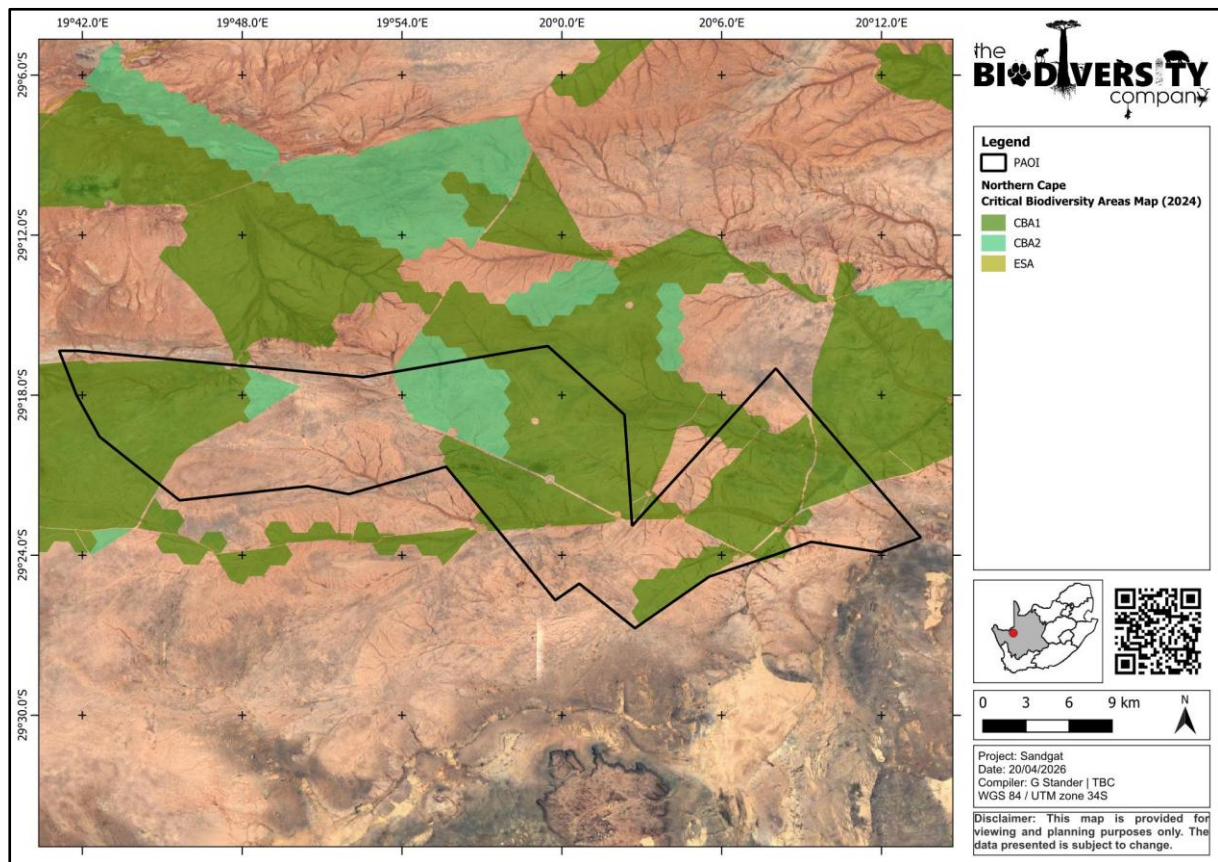


Figure 3-3 Map illustrating the PAOI in relation to the Northern Cape Biodiversity Sector Plan

3.1.1.4 Key Biodiversity Areas

A new set of Key Biodiversity Areas (KBA) specific to South Africa has been identified using the Global Standard for the Identification of Key Biodiversity Areas version 1.2 (IUCN 2016), applied to South African species and ecosystems. KBAs are critical sites that play a vital role in maintaining global biodiversity by serving as essential habitats for species. The identification of KBAs enables governments and civil society to pinpoint key locations crucial for species and their habitats worldwide. This understanding facilitates collaborative efforts to manage and conserve these areas, thereby safeguarding global biological diversity and supporting international biodiversity objectives.

Unlike the Important Bird Areas (IBAs), which primarily focus on birds, the KBA framework encompasses a broader spectrum of biodiversity, including mammals, amphibians, plants, and other taxa. BirdLife South Africa (BLSA), in consultation with the KBA National Coordination Group, has opted to retire IBAs and integrate KBAs into its conservation strategy. This strategic shift acknowledges the necessity of investing resources effectively to protect avian and other macroecological elements at the site level within a comprehensive framework of biodiversity conservation (KBA NCG, 2024).

The PAOI is located within 5 km of the Aggenys-Pella-Pofadder KBA (Figure 3-4).

The **Aggenys–Pella–Pofadder** KBA is a large terrestrial site with limited protection in the Northern Cape, South Africa, characterised by extensive plateau plains of semidesert steppe dominated by *Stipagrostis* grasses, interspersed with *Salsolea* shrubs and, in wetter years, rich displays of annual herbs. The landscape also features hills and mountains with bare rock outcrops and sparse shrubby vegetation, with habitats shaped by topography, climate, and geology. This KBA is internationally significant, meeting three criteria of the Global Standard for the Identification of KBAs: it supports significant proportions of the global populations of ten threatened species (criterion A1), contains the entire global populations of two Critically Endangered species, and regularly holds ten geographically restricted species (criterion B1). The site also meets criteria B2 and B3 for its assemblages of range-restricted Caryophyllales and endemic Namib Karoo drylands birds, and is 100% irreplaceable for the global persistence of six species (criterion E). KBA trigger species include both birds and plants, underscoring the site's critical role in conserving unique and threatened biodiversity.

The species that triggers the KBA is shown in Table 3-2.

Table 3-2 Species that trigger the KBA

Taxonomic group	Scientific name	Common name	IUCN Red List category	Year	KBA criteria
Aves	<i>Calendulauda burra</i>	Red Lark	VU	2024	A1b, B3b
Aves	<i>Eremomela gregalis</i>	Karoo Eremomela	LC	2024	B3b
Aves	<i>Eremopterix australis</i>	Black-eared Sparrow-lark	LC	2024	B3b
Aves	<i>Spizocorys sclateri</i>	Sclater's Lark	NT	2024	B3b
Aves	<i>Euryptila subcinnamomea</i>	Cinnamon-breasted Warbler	LC	2024	B3b
Saxifragales	<i>Adromischus nanus</i>		LC	2024	B1
Caryophyllales	<i>Cephalophyllum fulleri</i>		LC	2024	B1, B2

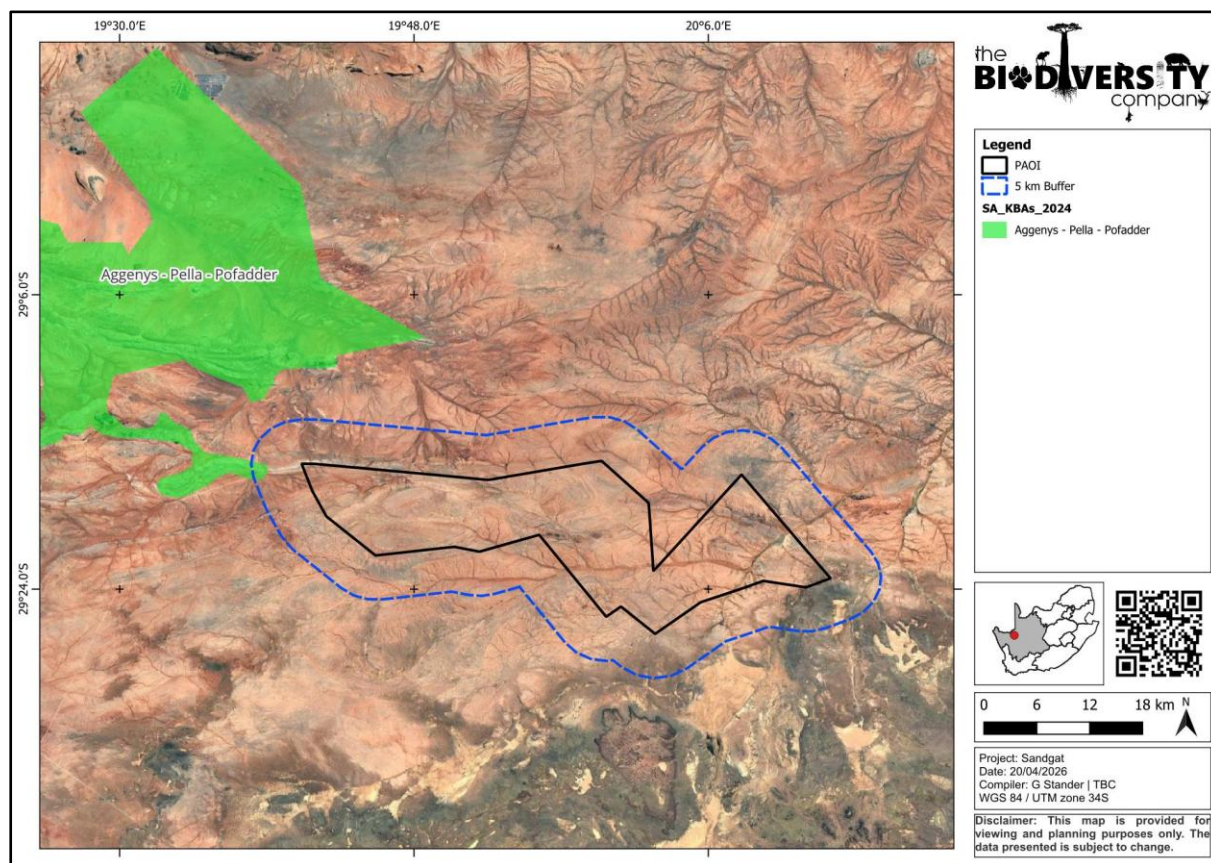


Figure 3-4 *The PAOI in relation to the KBA dataset*

3.1.1.5 South African Inventory of Inland Aquatic Ecosystems

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the NBA in 2018. Ecosystem threat status (ETS) of river and wetland ecosystem types are based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LT, with CR, EN and VU ecosystem types collectively referred to as 'threatened' (Van Deventer *et al.*, 2019; Skowno *et al.*, 2019).

The PAOI overlaps with the Endangered Kaboep and Soutputs se Laagte rivers, as well as CR Depression wetlands and unassessed rivers (Figure 3-5).

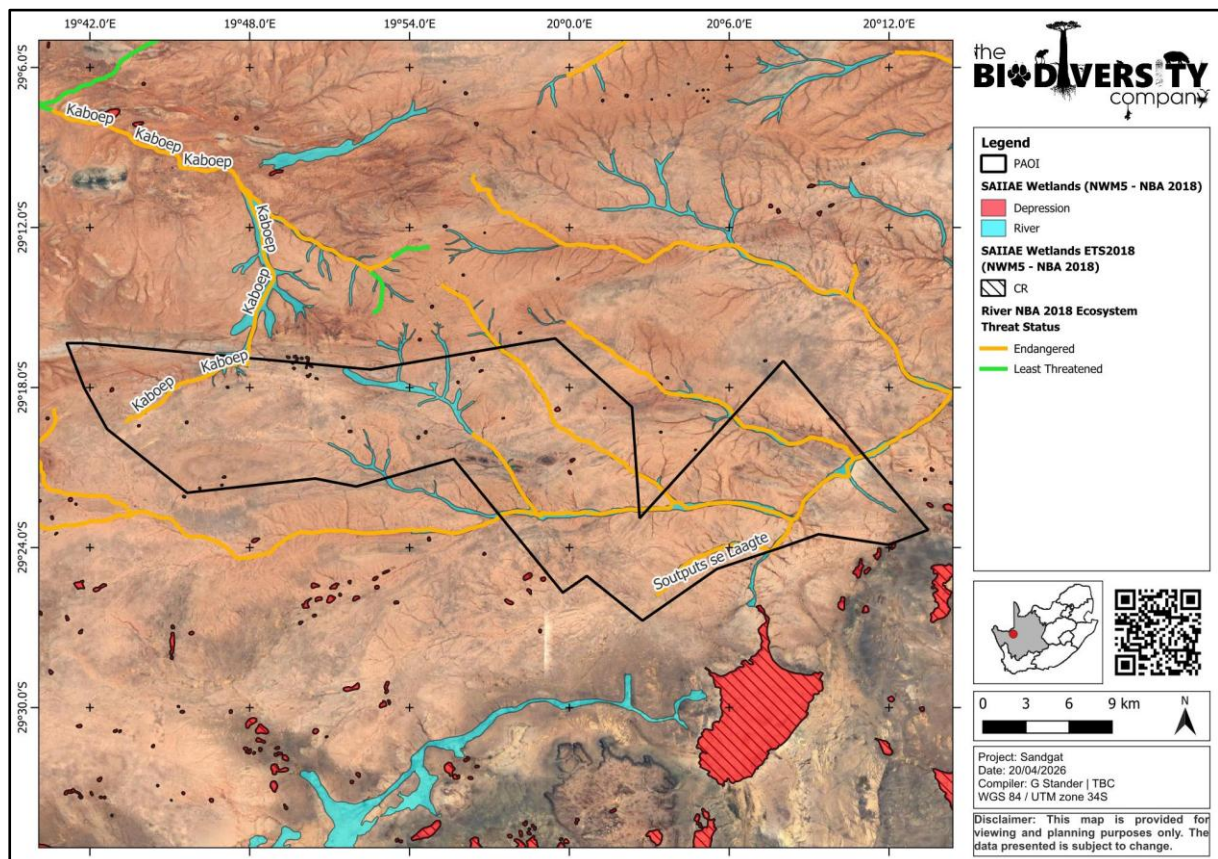


Figure 3-5 Map illustrating the PAOI in relation to the South African Inventory of Inland Aquatic Ecosystems dataset

3.1.1.6 National Freshwater Ecosystem Priority Area Status

To better conserve aquatic ecosystems, South Africa has categorised its river systems according to set ecological criteria (i.e., ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs) (Driver *et al.*, 2011). The FEPAs are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act's (NEM:BA) biodiversity goals (Nel *et al.*, 2011).

The PAOI overlaps with Non – priority wetlands (Seep, Flat, Depression), the Kaboep, Koeiamlaagte, Steenkampvlei se Holte and Soutputs se Laagte rivers which are all classified as Class B: Largely Natural River (Figure 3-6).

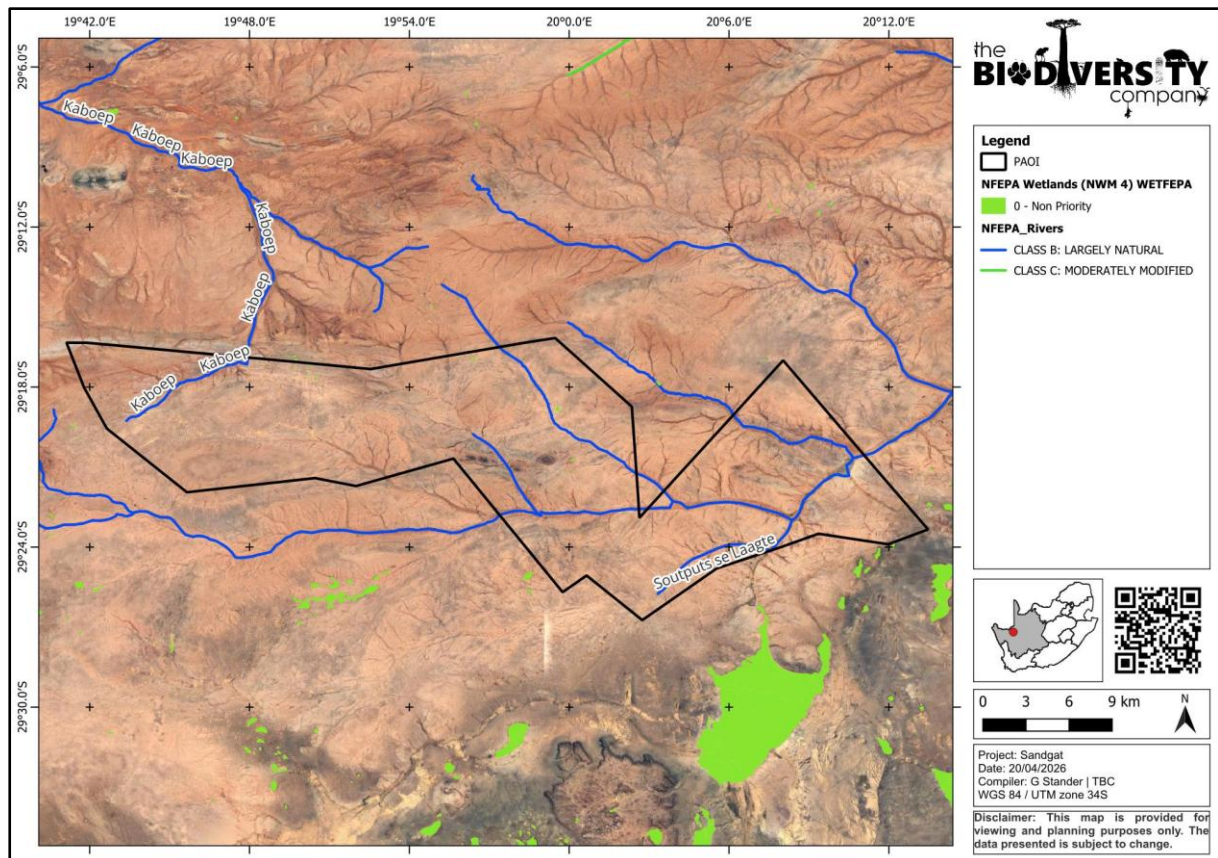


Figure 3-6 Map illustrating the PAOI in relation to the National Freshwater Ecosystem Priority Area dataset

3.1.1.7 Mining and Biodiversity Guidelines

According to the Mining and Biodiversity Guidelines spatial dataset (2013), the PAOI overlaps with areas of Moderate and Highest Biodiversity Importance (BI) and there is, therefore, a correlating moderate and highest risk for mining, respectively, as per the Mining and Biodiversity Guidelines categories (Figure 3-7).

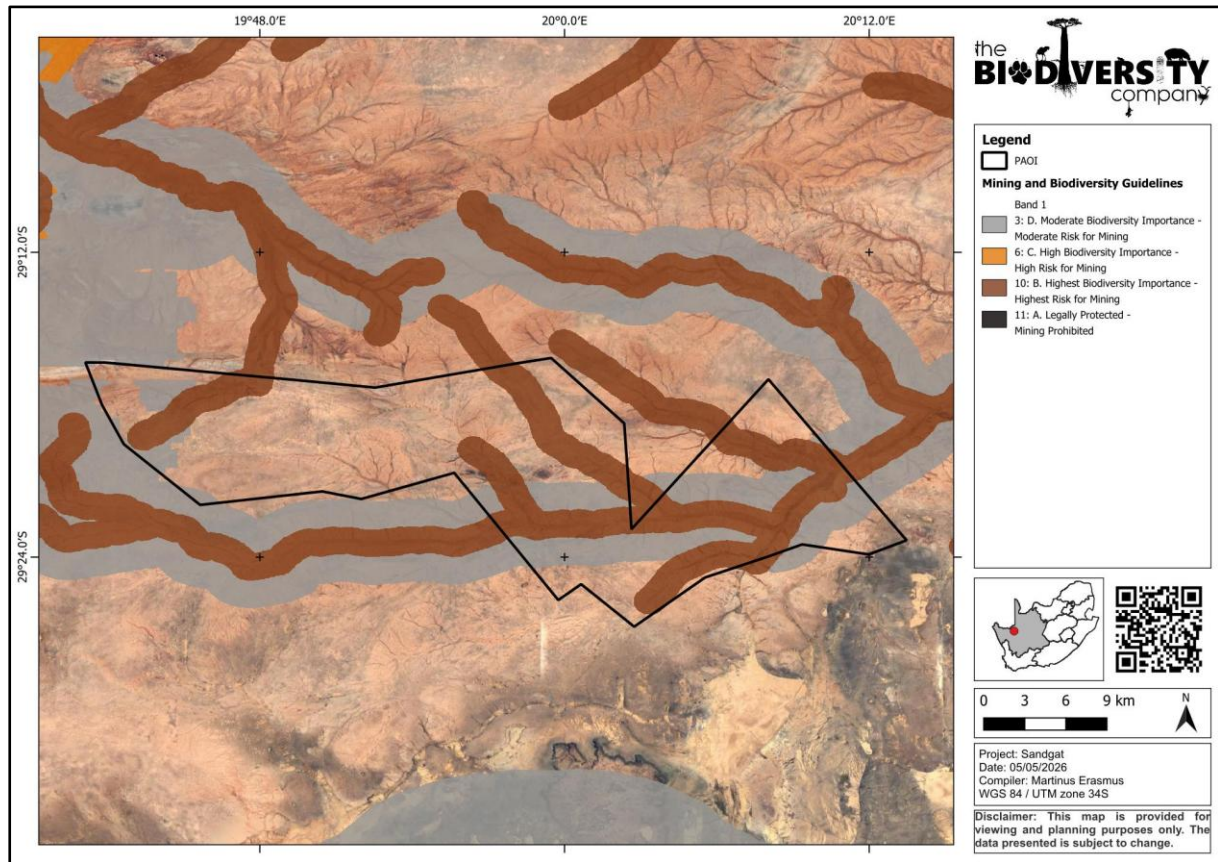


Figure 3-7 Map illustrating the PAOI and inferred reserves in relation to the Mining and Biodiversity Guidelines

3.1.2 Flora Assessment

This section is divided into a description of the vegetation type expected under natural conditions and the expected flora species.

On a fine scale, the PAOI largely overlaps with the Bushmanland Arid Grassland. It marginally overlaps with the Bushmanland Basin Shrubland and Bushmanland Inselberg Shrubland (Figure 3-8).

3.1.2.1 Vegetation Type

The PAOI is situated within the Nama Karoo and Succulent Karoo biomes.

3.1.2.1.1 Nama Karoo

This biome is found in the central plateau of the western half of South Africa. The geology underlying the biome is varied, as the distribution of this biome is determined primarily by rainfall. The rain falls in summer and varies between 100 and 520 mm per year. This also determines the predominant soil type - over 80% of the area is covered by a lime-rich, weakly developed soil over rock. Although less than 5% of rain reaches the rivers, the high erodibility of soils poses a major problem where overgrazing occurs (SANBI, 2019).

The dominant vegetation is a grassy, dwarf shrubland. Grasses tend to be more common in depressions and on sandy soils, and less abundant on clayey soils. Grazing rapidly increases the relative abundance of shrubs. Most of the grasses are of the C4 type and, like the shrubs, are deciduous in response to rainfall events (SANBI, 2019).

3.1.2.1.1.1 Bushmanland Arid Grassland

The Bushmanland Arid Grassland consists of extensive to irregular plains on a slightly sloping plateau. It is sparsely vegetated by grasslands, mainly dominated by white grasses (*Stipagrostis* species) giving this vegetation type the character of semidesert 'steppe'. In places, low shrubs of *Salsola* change the vegetation structure. In years of abundant rainfall rich displays of annual herbs can be expected.

Important Taxa (*d* = dominant)

Graminoids: *Aristida adscensionis* (*d*), *A. congesta* (*d*), *Enneapogon desvauxii* (*d*), *Eragrostis nindensis* (*d*), *Schmidtia kalahariensis* (*d*), *Stipagrostis ciliata* (*d*), *S. obtusa* (*d*), *Cenchrus ciliaris*, *Enneapogon scaber*, *Eragrostis annulata*, *E. porosa*, *E. procumbens*, *Panicum lanipes*, *Setaria verticillata*, *Sporobolus nervosus*, *Stipagrostis brevifolia*, *S. uniplumis*, *Tragus berteronianus*, *T. racemosus*.

Small Trees: *Senegalia mellifera* subsp. *detinens*, *Boscia foetida* subsp. *foetida*.

Tall Shrubs: *Lycium cinereum* (*d*), *Rhigozum trichotomum* (*d*), *Cadaba aphylla*, *Parkinsonia africana*.

Low Shrubs: *Aptosimum spinescens* (*d*), *Hermannia spinosa* (*d*), *Pentzia spinescens* (*d*), *Aizoon asbestinum*, *A. schellenbergii*, *Aptosimum elongatum*, *A. lineare*, *A. marlothii*, *Barleria rigida*, *Berkheya annectens*, *Blepharis mitrata*, *Eriocephalus ambiguus*, *E. spinescens*, *Limeum aethiopicum*, *Lophiocarpus polystachyus*, *Monechma incanum*, *M. spartioides*, *Pentzia pinnatisecta*, *Phaeoptilum spinosum*, *Polygala seminuda*, *Pteronia leucoclada*, *P. mucronata*, *P. sordida*, *Rosenia humilis*, *Senecio niveus*, *Sericocoma avolans*, *Solanum capense*, *Talinum arnotii*, *Tetragonia arbuscula*, *Zygophyllum microphyllum*.

Succulent Shrubs: *Kleinia longiflora*, *Lycium bosciifolium*, *Salsola tuberculata*, *S. glabrescens*.

Herbs: *Acanthopsis hoffmannseggiana*, *Aizoon canariense*, *Amaranthus praetermissus*, *Barleria lichtensteiniana*, *Chamaesyce inaequilatera*, *Dicoma capensis*, *Indigastrum argyraeum*, *Lotononis platycarpa*, *Sesamum capense*, *Tribulus pterophorus*, *T. terrestris*, *Vahlia capensis*.

Succulent Herbs: *Gisekia pharnacioides*, *Psilocaulon coriarium*, *Trianthema parvifolia*.

Geophytic Herb: *Moraea venenata*.

Biogeographically Important Taxon (Bushmanland endemic)

Succulent Herb: *Tridentea dwequensis*.

Endemic Taxa

Succulent Shrubs: *Dinteranthus poleevansii*, *Larryleachia dinteri*, *L. marlothii*, *Ruschia kenhardtensis*.

Herbs: *Lotononis oligocephala*, *Nemesia maxii*.

Conservation Status

This vegetation type is classified as Least Concerned (RLE, 2022). The national target for conservation protection for this vegetation types is 21%, with only small patches statutorily conserved in AuGrabies Falls National Park and Goegab Nature Reserve. Very little of the area has been transformed. The risk of erosion in this vegetation type is very low (60%) and low (33%).

3.1.2.1.1.2 Bushmanland Basin Shrubland

Bushmanland Basin Shrubland consist of slightly irregular plains with dwarf shrubland dominated by a mixture of low sturdy and spiny (and sometimes also succulent) shrubs (*Rhigozum*, *Salsola*, *Pentzia*, *Eriocephalus*), 'white' grasses (*Stipagrostis*) and in years of high rainfall also by abundant annuals such as species of *Gazania* and *Leysera*.

Important Taxa

Tall Shrubs: *Lycium cinereum* (d), *Rhigozum trichotomum* (d).

Low Shrubs: *Aptosimum spinescens* (d), *Hermannia spinosa* (d), *Pentzia spinescens* (d), *Zygophyllum microphyllum* (d), *Aptosimum elongatum*, *A. marlothii*, *Berkheya annectens*, *Eriocephalus microphyllus* var. *pubescens*, *E. pauperrimus*, *E. spinescens*, *Felicia clavipilosa* subsp. *clavipilosa*, *Limeum aethiopicum*, *Osteospermum armatum*, *O. spinescens*, *Pegolettia retrofracta*, *Phaeoptilum spinosum*, *Plinthus karooicus*, *Polygala seminuda*, *Pteronia glauca*, *P. inflexa*, *P. leucoclada*, *P. mucronata*, *P. sordida*, *Rosenia humilis*, *Selago albida*, *Senecio niveus*, *Tetragonia arbuscula*, *Zygophyllum lichtensteinianum*.

Succulent Shrubs: *Salsola tuberculata* (d), *Aridaria noctiflora* subsp. *straminea*, *Brownanthus ciliatus* subsp. *ciliatus*, *Galenia sarcophylla*, *Lycium bosciifolium*, *Ruschia intricata*, *Salsola namibica*, *Sarcocaulon patersonii*, *S. salmoniflorum*, *Tripteris sinuata* var. *linearis*, *Zygophyllum flexuosum*.

Semiparasitic Shrub: *Thesium hystrix*.

Herbs: *Gazania lichtensteinii* (d), *Leysera tenella* (d), *Amaranthus praetermissus*, *Chamaesyce inaequilatera*, *Dicoma capensis*, *Indigastrium argyraeum*, *Lepidium desertorum*, *Monsonia umbellata*, *Radyera urens*, *Sesamum capense*, *Tribulus terrestris*, *T. zeyheri*.

Succulent Herbs: *Mesembryanthemum crystallinum*, *M. stenandrum*, *Trianthema parvifolia*, *Zygophyllum simplex*.

Graminoids: *Aristida adscensionis* (d), *Enneapogon desvauxii* (d), *Stipagrostis ciliata* (d), *S. obtusa* (d), *Aristida congesta*, *Enneapogon scaber*, *Stipagrostis anomala*, *Tragus berteronianus*, *T. racemosus*.

Biogeographically Important Taxon (Bushmanland endemic)

Succulent Herb: *Tridentea dwequensis*.

Endemic Taxa

Herb: *Cromidon minutum*.

Geophytic Herbs: *Ornithogalum bicornutum*, *O. ovatum* subsp. *oliverorum*.

Conservation Status

This vegetation type is classified as Least Concern (RLE, 2022). The national target for conservation protection for this vegetation types is 21%. None of the unit is conserved in statutory conservation areas. No signs of serious transformation, but scattered individuals of *Prosopis* sp. occur in some areas (e.g. in the vicinity of the Sak River drainage system), and some localised dense infestations form closed 'woodlands' along the eastern border of the unit with Northern Upper Karoo (east of Van Wyksvlei).

3.1.2.1.2 Succulent Karoo

Most of the biome covers a flat to gently undulating plain, with some hilly and "broken" veld, mostly situated to the west and south of the escarpment, and north of the Cape Fold Belt. The altitude is mostly below 800 m, but in the east, it may reach 1 500 m (SANBI, 2019).

The Succulent Karoo Biome is primarily determined by the presence of low winter rainfall and extreme summer aridity. Rainfall varies between 20 and 290 mm per year. Because the rains are cyclonic, and not due to thunderstorms, the erosive power is far less than that of the summer rainfall biomes. During summer, temperatures in excess of 40°C are common, while fog is common nearer to the coast (SANBI, 2019).

The vegetation is dominated by dwarf, succulent shrubs, of which the Vygies (Mesembryanthemaceae) and Stonecrops (Crassulaceae) are particularly prominent. Mass flowering displays of annuals (mainly Daisies Asteraceae) occur in spring, often on degraded or fallow lands. Grasses are rare, except in some sandy areas, and are of the C3 type. The number of plant species, mostly succulents, is very high and unparalleled elsewhere in the world for an arid area of this size (SANBI, 2019).

3.1.2.1.2.1 Bushmanland Inselberg Shrubland

This vegetation type consists of inselbergs and koppies in a surrounding flat, plains environment. The vegetation consists of succulent and non-succulent shrubland, with a sparse grass layer, on the steep slopes. Rainfall, occurring mostly from February to April, is very low, with MAP below 100 mm.

Important Taxa (*d* = *dominant*)

Succulent Shrubs: *Adromischus diabolicus* (*d*), *Euphorbia gregaria* (*d*), *Ihlenfeldtia vanzylii* (*d*), *Ruschia divaricata* (*d*), *Schwantesia pillansii* (*d*), *Tylecodon sulphureus* (*d*), *Euphorbia gariepina*, *Kleinia longiflora*, *Othonna euphorbioides*, *Psilocaulon subnodosum*, *Tetragonia reduplicata*, *Tylecodon rubrovenosus*.

Tall Shrub: *Boscia foetida*.

Low Shrubs: *Eriocephalus pauperrimus* (*d*), *Pteronia unguiculata*.

Woody Succulent Climber: *Sarcostemma viminale* (*d*).

Herb: *Acanthopsis hoffmannseggiana*.

Succulent Herbs: *Anacampseros baeseckeii* (*d*), *A. karasmontana* (*d*), *Avonia ruschii* (*d*), *Conophytum fulleri* (*d*), *Avonia quinaria* subsp. *alstonii*, *Conophytum marginatum* var. *haramoepense*.

Graminoids: *Aristida adscensionis* (*d*), *Eragrostis annulata*, *Stipagrostis obtusa*.

Biogeographically Important Taxa (^{NQ}Namaqualand endemic, ^GGariep endemic)

Succulent Shrubs: (d), *Ceraria fruticulosa*^G, *Cheiridopsis pillansii*^G.

Geophytic Herb: *Whiteheadia bifolia*^{NQ}.

Succulent Shrub: *Hoodia alstonii*^G.

Endemic Taxon

Succulent Herb: *Huernia barbata* subsp. *ingeae*.

Conservation Status

This vegetation type is classified as Least Concern (RLE, 2022). It is currently threatened by mining nearby Aggenys. The conservation target is 34% and none is currently statutorily conserved.

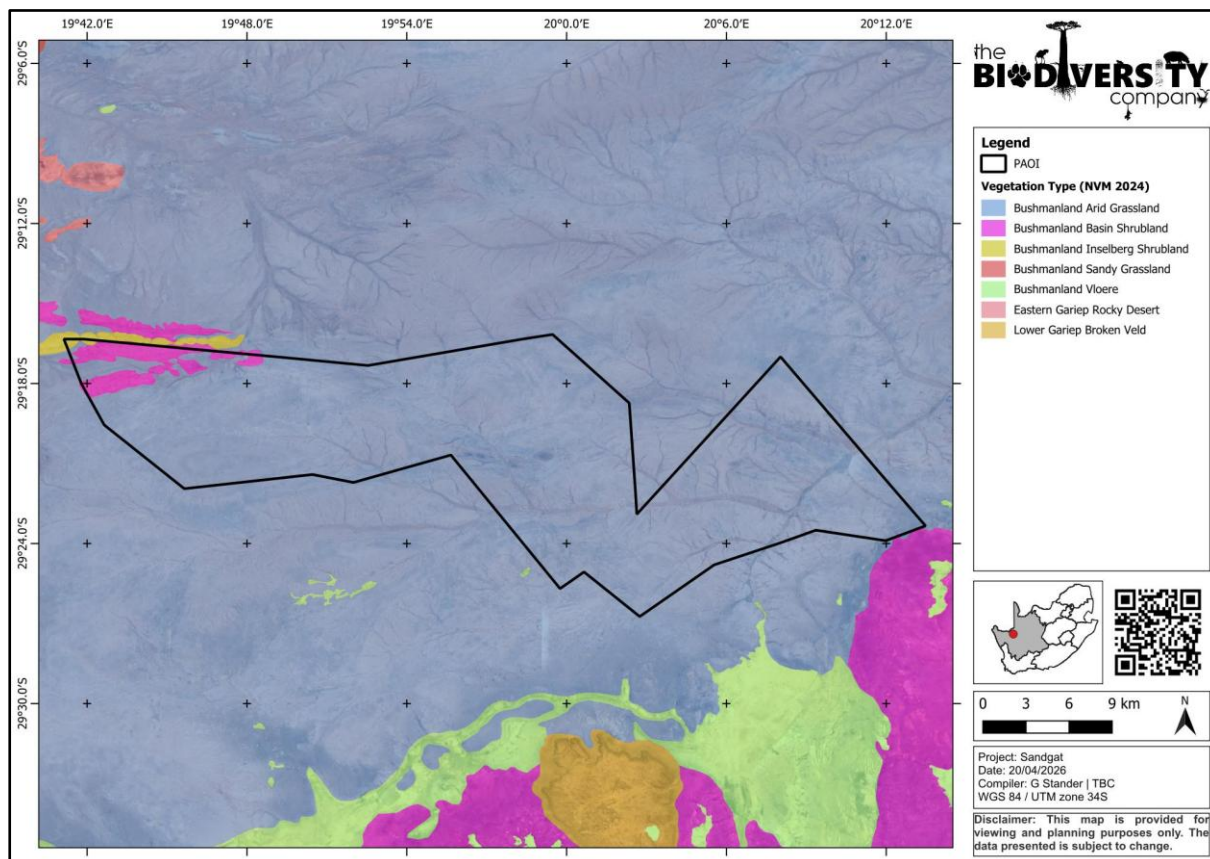


Figure 3-8 Map illustrating the vegetation types associated with the PAOI

3.1.2.2 Expected Flora Species

The GBIF database indicates that 306 species of indigenous plants are expected to occur within the PAOI. Appendix B (Section 7.4.1) provides the list of species and their respective conservation status and endemism. (Appendix D). In total, 18 flora SCC may occur within the PAOI based on the GBIF database, Screening Tool and prior knowledge of the landscape which the PAOI overlaps (Table 3-3).

Please note that the Screening Tool report includes lists of bird, mammal, reptile, amphibian, butterfly and plant species of conservation concern known or expected to occur on the proposed development footprint. Some of these SCC are sensitive to illegal harvesting. Such species have had their names obscured and are listed as sensitive plant unique number/sensitive animal unique number. As per the best practise guideline that accompanies the protocol and screening tool, **the name of the sensitive species may not appear in the final EIA report nor any of the specialist reports released into the**

public domain. It should be referred to as *sensitive plant* or *sensitive animal* and its threat status may be included, e.g. *critically endangered sensitive plant* or *endangered sensitive animal*.

Table 3-3 *List of expected flora Species of Conservation Concern. NT = Near Threatened, VU = Vulnerable, EN = Endangered, CR = Critically Endangered and DDD = Data Deficient Insufficient Information*

Family Name	Scientific Name	Screening Tool Sensitivity	Conservation status (Regional)	Habitat	Likelihood of Occurrence	Reason
Anacampserota ceae	<i>Anacampseros quinaria</i>		EN	Rock outcrops	High	Recorded within PAOI
Amaryllidaceae	<i>Brunsvigia gariepensis</i>		EN	Rocky quartzitic slopes and summits of Bushmanland inselbergs	High	Suitable habitat within PAOI
Asphodelaceae	<i>Bulbine striata</i>		CR	Amongst quartz pebbles and rocks in well-drained soil on the upper and middle slopes below sheer rock faces.	Low	No slopes of sheer rock faces within PAOI.
Colchicaceae	<i>Colchicum bellum</i>		DD	Its habitat is uncertain. It possibly occurs on sandy flats, sometimes with quartz gravel.	Medium	Suitable habitat within PAOI
Aizoaceae	<i>Conophytum limpidum</i>		EN	The plants are associated with Bushmanland inselbergs where they generally prefer shaded niches, e.g., in vertical crevices.	High	Suitable habitat within PAOI
Aizoaceae	<i>Conophytum praeseatum</i>		EN	It is typically found in partial shade (e.g., beneath larger shrubs) on low granite ridges and in rubble.	High	Suitable habitat within PAOI
Aizoaceae	<i>Dinteranthus pole-evansii</i>		VU	Well-drained, sandy soils associated with quartz stones and pebbles.	High	Suitable habitat within PAOI
Mesembryanthemaceae	<i>Dinteranthus wilmotianus</i>		NT	Plants grow on quartz slopes and alluvial gravel soils.	High	Suitable habitat within PAOI
Aizoaceae	<i>Lithops dorotheae</i>		EN	Plants occur on fine-grained, sheared, feldspathic quartzite.	High	Suitable habitat within PAOI
Aizoaceae	<i>Lithops olivacea</i>		VU	Quartzite gravel.	High	Suitable habitat within PAOI

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Family Name	Scientific Name	Screening Tool Sensitivity	Conservation status (Regional)	Habitat	Likelihood of Occurrence	Reason
Aizoaceae	<i>Drosanthemum calycinum</i>		NT	Lowland shale.	Medium	Suitable habitat within PAOI
Crassulaceae	<i>Crassula garibina subsp. glabra</i>		Rare	Rock crevices in granite or quartzite outcrops.	High	Suitable habitat within PAOI
Crassulaceae	<i>Tylecodon sulphureus var. armianus</i>		Rare	Steep, often sheer, north-facing quartz cliffs, shaded for most of the day, 700-1100 m	Low	No cliffs within PAOI
Fabaceae	<i>Calobota lotononoides</i>		NT	Occurs on deep, well-drained sandy soils and is adapted to shifting dunes.	Medium	Suitable habitat within PAOI
Fabaceae	<i>Crotalaria pearsonii</i>		VU	Dry ravines, in granite and quartzite derived soils.	High	Suitable habitat within PAOI
	Sensitive Species 1209	Medium	EN		High	Suitable habitat within PAOI
	Sensitive Species 545	Medium	VU		High	Recorded within PAOI
	Sensitive Species 317	Medium	Rare		High	Suitable habitat within PAOI

3.1.3 Fauna Assessment

3.1.3.1 Mammals

The GBIF database lists eight (8) mammal species that are expected to occur within the PAOI (Expected Mammal Species). None of these are SCC and none are listed by the Screening Tool.

3.1.3.2 Herpetofauna

The GBIF database lists no amphibian species and thirteen (13) reptile species as likely to occur within the PAOI. One (1) reptile SCC is expected (Table 3-4). The Screening Tool does not list any herpetofauna.

Table 3-4 List of expected herpetofauna Species of Conservation Concern. NT = Near Threatened

Family	Scientific Name	Common Name	Regional (SANBI)	Global (IUCN)	Habitat	Likelihood of Occurrence	Reason
Testudinidae	<i>Psammobates tentorius veroxii</i>	Tent Tortoise	NT	NT	Arid regions under varying temperature regimes. Inland plateau above 900 m.	High	Recorded within PAOI

3.1.3.3 Avifauna

The SABAP2 database lists 74 avifauna species that could be expected to occur within the area (Appendix D). Nine (9) additional SCC have been observed close to or within the PAOI and the

Secretarybird (*Sagittarius serpentarius*) was listed in the Screening Tool, totalling to 84 species. Of these, 18 SCC are expected for the PAOI (Table 3-5).

Table 3-5 *List of avifauna Species of Conservation Concern that may occur in the PAOI. CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern*

Common Name	Scientific Name	Regional	Global	Likelihood of Occurrences
Black Harrier	<i>Circus maurus</i>	EN	EN	Confirmed
Burchell's Courser	<i>Cursorius rufus</i>	VU	LC	High
Cape Shoveler	<i>Spatula smithii</i>	NT	LC	Low
Hamerkop	<i>Scopus umbretta</i>	NT	LC	Moderate
Karoo Korhaan	<i>Eupodotis vigorsii</i>	NT	LC	Confirmed
Kori Bustard	<i>Ardeotis kori</i>	NT	NT	High
Lanner Falcon	<i>Falco biarmicus</i>	NT	LC	Confirmed
Lappet-faced Vulture	<i>Torgos tracheliotos</i>	CR	EN	Confirmed
Ludwig's Bustard	<i>Neotis ludwigii</i>	EN	EN	Confirmed
Martial Eagle	<i>Polemaetus bellicosus</i>	EN	EN	High
Red-billed Teal	<i>Anas erythrorhyncha</i>	NT	LC	Confirmed
Red Lark	<i>Calendulauda burra</i>	VU	VU	Low
Sclater's Lark	<i>Spizocorys sclateri</i>	NT	NT	High
Secretarybird	<i>Sagittarius serpentarius</i>	VU	EN	High
Southern Black Korhaan	<i>Afrotis afra</i>	VU	VU	Moderate
Verreaux's Eagle	<i>Aquila verreauxii</i>	VU	VU	High
White-backed Vulture	<i>Gyps africanus</i>	CR	CR	Confirmed

(Lee *et. al* 2025, IUCN 2021)

Black Harrier (*Circus maurus*) is categorised as EN on a regional and global scale. It is endemic to southern Africa, where its core range is in the Western Cape, but also occurs in the Eastern Cape, the Northern Cape and Free State (where it is irruptive in both areas), Lesotho and Namibia (BirdLife International, 2021a). The species occupies coastal and montane fynbos, highland grasslands, Karoo subdesert scrub, open plains with low shrubs and croplands. It often breeds close to coastal and upland marshes with tall shrubs or reeds, occurring in dry steppe and grassland areas further north in the non-breeding season. Local fluctuations in breeding numbers may be related to population cycles in its prey base, such as mice whose numbers fluctuate with rainfall, especially in the more arid regions. The total population is estimated at < 1 000 individuals in South Africa, Lesotho and Eswatini (Cervantes *et al.* 2022) with only around 10 mature individuals outside this region. The population is thought to have undergone a major decline of 85% in the past 100 years (17% in 20 years) due to habitat loss (BirdLife International, 2021a). Habitat is primarily lost to agriculture, and this is compounded by the uncontrolled burning of fynbos and grassland, which renders these habitats unsuitable for breeding for about five years. Additional threats include low hatching rates due to pesticide use and overgrazing. It was confirmed within the PAOI.

Burchell's Courser (*Cursorius rufus*) is categorised as VU and LC on a regional and global scale respectively. It inhabits open short-sward grasslands, dry savannas, fallow fields, overgrazed or burnt grasslands and pastures, bare or sparsely vegetated sandy or gravelly deserts, stony areas dotted with small shrubs and saltpans (IUCN, 2025a). The species is threatened in the south of its range by habitat degradation as a result of poor grazing practices and agricultural intensification. The likelihood of

occurrence in the project area is rated as moderate. The presence of these features in the PAOI means that it has a high likelihood of occurring here.

Hamerkop (*Scopus umbretta*) is listed as regionally NT and globally LC. It is found in a range of freshwater and marine habitats. It feeds predominantly on frogs and tadpoles. It has experienced significant reductions in its estimated population numbers, but the reasons underlying this reduction remain unclear. This species was confirmed at the site during the field study. It was confirmed by Chris van Rooyen in 2014 in the near vicinity of the area and with the presence of various water features, it will likely occur here.

Karoo Korhaan (*Eupodotis vigorsii*) is listed as NT regionally and LC globally. It is found in dwarf arid shrubland of the Nama Karoo and Succulent Karoo. They are resident and sedentary species which means their movement is restricted to their home range and they do not migrate locally. Their diets consist mainly of invertebrates, reptiles and plant matter, on which they feed while walking along. The pairs are monogamous and often breed in family groups. Helpers can assist in defending the territory or feeding of the young. They nest on the ground with the main egg-laying season being between June and February. Main threats include habitat degradation due to agricultural practices and ecosystem stresses due to climate change (IUCN, 2024). This species was confirmed within the PAOI.

Kori Bustard (*Ardeotis kori*) is listed as NT on a regional and global scale (BirdLife International, 2016). This species has a large but disjunct range in sub-Saharan Africa, occurring from Ethiopia and Somalia south to Tanzania, and from southern Angola and Zimbabwe south to South Africa. The species occupies flat, arid, mostly open country such as grassland, karoo, bushveld, thornveld, scrubland and savanna but also including modified habitats such as wheat fields and firebreaks. The diet includes a wide range of plants and animals including insects, reptiles, small rodents, birds, carrion, seeds, berries and roots. It is largely sedentary but does undertake local movements. The global population size has not been quantified, but the population in South Africa has been estimated at 2 000-5 000 birds individuals (BirdLife International, 2016). A major threat is collision with overhead powerlines but the causes of population declines and range losses in many parts of the distribution are unknown. These have been hypothesised to include persecution, rangeland degradation and bush encroachment. Due to the presence of scrubland and numerous open spaces, this species has a high likelihood of occurring within the PAOI.

Lanner Falcon (*Falco biarmicus*) is categorised as NT regionally and LC globally. This falcon is native to South Africa and inhabits a wide variety of habitats, from open grassland to open cleared woodlands and agricultural areas. Global population estimates is more than 30000 breeding pairs, in South Africa it is estimated to be 1400 pairs. They may occur in groups up to 20 individuals, but have also been observed solitary. They are partial and facultative migrants, that breeds from May to early September. Nests are mostly found on cliff ledges, and they may alternate between more than one nest. Their diet is mainly composed of small birds such as pigeons and francolins. Anecdotal evidence suggests these species are susceptible to agrochemicals, another threat to their population is the clearing of grassland habitats (Roberts *et al.*, 2023). This species was observed within the PAOI.

Lappet-faced Vulture (*Torgos tracheliotus*) is listed as CR regionally and EN on a global level. Only a small, very rapidly declining population remains, owing primarily to poisoning and persecution, as well as ecosystem alterations (IUCN, 2021b). The species inhabits dry savanna, arid plains, deserts and open mountain. It ranges widely when foraging and is mainly a scavenger, feeding predominantly on any large carcasses or their remains. This rare species is unlikely to be resident within the project area due to unsuitable nesting sites but may scavenge on any dead carcasses in the area. It recorded in the Pachnoda assessment therefore there is a high likelihood of occurrence. These vultures were observed within the PAOI.

Ludwig's Bustard (*Neotis ludwigii*) is listed as EN on a regional and global scale (BirdLife International, 2025b). The species has a large range centred on the dry biomes of the Karoo and Namib in southern

Africa, being found in the extreme south-west of Angola, western Namibia and South Africa. This species inhabits open lowland and upland plains with grass and light thornbush, sandy open shrub-veld and semi-desert in the arid and semi-arid Namib and Karoo biomes. Ludwig's Bustard is nomadic and a partial migrant, moving to the western winter-rainfall part of its range in winter. The diet includes invertebrates, small vertebrates and vegetable matter. The global population is estimated to be 100 000 – 499 999 individuals. The primary threat to the species is collisions with overhead power lines, with potentially thousands of individuals involved in such collisions each. Collision rates on high voltage transmission lines in the Karoo may exceed one Ludwig's Bustard per kilometre per year. Bustards have limited frontal vision so may not see power lines, even if they are marked. This bird was observed on numerous occasions within the PAOI due to suitable habitat.

Martial Eagle (*Polemaetus bellicosus*) is listed as EN on a regional scale and EN on a global scale. This species has an extensive range across much of sub-Saharan Africa, but populations are declining due to deliberate and incidental poisoning, habitat loss, reduction in available prey, pollution and collisions with power lines (IUCN, 2020a). It inhabits open woodland, wooded savanna, bushy grassland, thornbush and, in southern Africa, more open country and even sub-desert (IUCN, 2020a). It was confirmed in a nearby study site.

Red-billed Teal (*Anas erythrorhyncha*) is listed as regionally NT and globally LC. It occurs in a large variety of shallow wetlands. The threats are not well understood but leech infestations and other changes to their habitats. This species was confirmed at the site during the field study.

Red Lark (*Calendulauda burra*) is listed as VU both locally and internationally (IUCN, 2021c). Their habitat consist of tropical dry shrubland to dry lowland grassland. This species is threatened by habitat destruction and loss. The likelihood of this species occurring within the PAOI is moderate due to the area not being within the lark's localized range, but the habitat being suitable due to the presence of grassland.

Sclater's Lark (*Spizocorys sclateri*) is classified as NT both regionally and internationally. This species is native to South Africa and Namibia. It is found in dry shrubland, where its habitat is threatened by increased numbers of livestock in its habitat. It has a high likelihood of occurring within the PAOI.

Secretarybird (*Sagittarius serpentarius*) (Secretarybird) is listed as VU on a regional scale and EN on a global scale (BirdLife International, 2020b). It occurs in sub-Saharan Africa and inhabits grasslands, open plains, and lightly wooded savanna. It is also found in agricultural areas and sub-desert (IUCN, 2017). The species has a wide distribution across sub-Saharan Africa, but surveyed densities suggest that the total population size does not exceed a five-figure number. Ad-hoc records, localised surveys and anecdotal observations indicate apparent declines in many parts of the species' range, especially in South Africa where reporting rates decreased by at least 60% of quarter degree grid cells used in Southern African Bird Atlas Projects. Threats include excessive burning of grasslands that may suppress populations of prey species, whilst the intensive grazing of livestock is also probably degrading otherwise suitable habitat. Disturbance by humans is likely to negatively affect breeding. The species is captured and traded; however, it is unknown how many deaths occur in captivity and transit. Direct hunting and nest-raiding for other uses and indiscriminate poisoning at waterholes are also further threats. A proposed conservation action is that landowners of suitable properties should join biodiversity stewardship initiatives and to manage their properties in a sustainable way for the species' populations. Due to the presence of open plains and grasslands, the species has a high likelihood of occurring within the PAOI.

Verreaux's Eagle (*Aquila verreauxii*) is classified as VU on a regional and global scale. It is found in mountainous and rocky cliff habitat. They are usually found in pairs that remain close for up to 95 % of the day. This monogamous pair are solitary nesters with two nests in their territories, a main and an alternative nest. The nest is a stick structure, up to 1.8m in diameter. They mainly breed on steep inaccessible cliffs, but artificial structures and in some instances large trees are also used. Breeding

occurs from April to November (Del Hoyo, 1994). Their diet consist of Hyrax (60%), Vervet Monkeys, Chacma Baboons and smaller mammal species. The species is locally persecuted in southern Africa where it coincides with livestock farms, but because the species does not take carrion, is little threatened by poisoned carcasses. Where hyraxes are hunted for food and skins, eagle populations have declined (Ferguson- Lees and Christie, 2001). The presence of rocky outcrops and a confirmation of the species in 2014 within the near vicinity of the area means that it will likely occur within the PAOI.

White-backed Vulture (*Gyps africanus*) is listed as CR on a regional and global scale (BirdLife International, 2021d). This species is the most widespread vulture in Africa and occurs from Senegal, Gambia and Mali in the west, throughout the Sahel region to Ethiopia and Somalia in the east, through East Africa into Mozambique, Zimbabwe, Botswana, Namibia and South Africa in the south. *Gyps africanus* is primarily a lowland species of open wooded savanna, particularly areas of thornveld. It requires tall trees for nesting but has also been recorded nesting on electricity pylons in South Africa. It is a gregarious species congregating at carcasses, in thermals and at roost sites and nests in loose colonies. The species' global population was estimated at 270 000 individuals in 1992, but it is likely considerably lower than this due to rapid population declines in recent years. The median estimate of the rate of decline, 4.1% annually (2.5-5.4%), is equivalent to a three-generation reduction of 81% (63-89%) (BirdLife International, 2021d). The species faces similar threats to other African vultures, being susceptible to habitat conversion to agro-pastoral systems, loss of wild ungulates leading to a reduced availability of carrion, hunting for trade, persecution and poisoning. In southern Africa, vultures are caught and consumed for perceived medicinal and psychological benefits, and the decline and possible extirpation in Nigeria has been attributed to the trade in vulture parts for traditional juju practices. The species was confirmed within the PAOI.

3.2 Fieldwork Findings

3.2.1 Flora Assessment

This section is divided into three sections:

- Indigenous flora;
- Protected species; and
- Alien Invasive Plants (AIPs).

3.2.1.1 Indigenous Flora

The vegetation assessment was conducted throughout the extent of the PAOI. A total of 83 indigenous plant species were recorded in the PAOI during the field assessment (Table 3-6). Notably, this is not a complete list of indigenous flora recorded within the PAOI, but only species that were able to be recorded within the PAOI within the time and accessibility constraints.

The list of plant species recorded is by no means comprehensive, and repeated surveys during different phenological periods not covered, may likely yield additional flora species for the PAOI. However, floristic analysis conducted to date is regarded as a sound representation of the local flora for the PAOI. Some of the plant species recorded can be seen in Figure 3-9.

Table 3-6 The flora species observed within the PAOI. VU = Vulnerable, EN = Endangered, LC = Least Concern and DDD = Data Deficient Insufficient Information

Family Name	Scientific Name	RSA Status	Conservation status (Regional)	Notes
Acanthaceae	<i>Acanthopsis hoffmannseggiana</i>	Indigenous, not endemic	DDD	
Aizoaceae	<i>Aizoon papulosum</i>	Indigenous, not endemic	LC	Provincially protected

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Family Name	Scientific Name	RSA Status	Conservation status (Regional)	Notes
Aizoaceae	<i>Mesembryanthemum tetragonum</i>	Indigenous, not endemic	LC	Provincially protected
Aizoaceae	<i>Conophytum friedrichiae</i>	Indigenous, not endemic	VU	Provincially protected
Aizoaceae	<i>Mesembryanthemum guerichianum</i>	Indigenous, not endemic	LC	Provincially protected
Aizoaceae	<i>Trichodiadema setuliferum</i>	Endemic	LC	Provincially protected
Aizoaceae	<i>Trianthera parvifolium</i>	Indigenous	LC	Provincially protected
Aizoaceae	<i>Ruschia spinosa</i>	Indigenous	LC	Provincially protected
Aizoaceae	<i>Drosanthemum hispidum</i>	Indigenous	LC	Provincially protected
Aizoaceae	<i>Mesembryanthemum junceum</i>	Endemic	LC	Provincially protected
Amaranthaceae	<i>Manochlamys albicans</i>	Indigenous	LC	
Amaranthaceae	<i>Caroxylon aphyllum</i>	Indigenous	LC	
Amaranthaceae	<i>Chenopodium berlandieri</i>	Likely not indigenous / naturalised	LC	
Amaranthaceae	<i>Amaranthus albus</i>	Not indigenous / naturalised	LC	
Amaranthaceae	<i>Chenopodium murale</i>	Not indigenous / naturalised	NE	
Amaranthaceae	<i>Atriplex lindleyi</i>	Not indigenous / naturalised	LC	
Anacampserotaceae	<i>Anacampseros papyracea</i>	Endemic	LC	Provincially protected
Anacampserotaceae	<i>Anacampseros quinaria</i>	Endemic	EN	Provincially protected
Anacampserotaceae	<i>Anacampseros filamentosa</i>	Indigenous	LC	Provincially protected
Anacardiaceae	<i>Schinus molle</i>	Not indigenous / naturalised / invasive		
Apocynaceae	<i>Microlophium incanum</i>	Indigenous, not endemic	LC	Provincially protected
Apocynaceae	<i>Hoodia gordonii</i>	Indigenous	DDT	Nationally & Provisionally Protected
Apocynaceae	<i>Gomphocarpus filiformis</i>	Not endemic	LC	Provincially protected
Asparagaceae	<i>Asparagus capensis</i>	Indigenous	LC	
Asparagaceae	<i>Eriospermum</i>	Higher taxon / genus		
Asparagaceae	<i>Albuca</i>	Higher taxon / genus		
Asparagaceae	<i>Lachenalia carnososa</i>	Endemic	LC	
Asparagaceae	<i>Ledebouria apertiflora</i>	Not endemic	LC	
Asphodelaceae	<i>Haworthiopsis tessellata</i>	Indigenous, not endemic	LC	
Asteraceae	<i>Kleinia longiflora</i>	Indigenous	LC	
Asteraceae	<i>Pentzia incana</i>	Indigenous, not endemic	LC	
Asteraceae	<i>Pteronia mucronata</i>	Not endemic	LC	
Asteraceae	<i>Geigeria ornativa</i>	Not endemic	LC	
Asteraceae	<i>Arctotis leiocarpa</i>	Indigenous	LC	
Asteraceae	<i>Gazania lichtensteinii</i>	Indigenous	LC	
Asteraceae	<i>Berkheya spinosissima</i>	Indigenous	LC	
Asteraceae	<i>Pegolettia retrofracta</i>	Indigenous	LC	
Bignoniaceae	<i>Rhigozum trichotomum</i>	Indigenous	LC	
Brassicaceae	<i>Heliophila seselifolia</i>	Endemic	LC	
Cactaceae	<i>Cactaceae sp.</i>			
Cactaceae	<i>Opuntia cespitosa</i>	Not indigenous / invasive		
Capparaceae	<i>Boscia foetida</i>	Indigenous / partly endemic at subspecies level	LC	Provincially protected
Cleomaceae	<i>Cleome gynandra</i>	Indigenous	LC	

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Family Name	Scientific Name	RSA Status	Conservation status (Regional)	Notes
Colchicaceae	<i>Ornithoglossum vulgare</i>	Indigenous	LC	
Cucurbitaceae	<i>Cucumis africanus</i>	Indigenous	LC	
Euphorbiaceae	<i>Euphorbia rhombifolia</i>	Indigenous, not endemic	LC	Provincially protected
Fabaceae	<i>Indigofera heterotricha</i>	Indigenous	LC	
Fabaceae	<i>Melolobium candicans</i>	Endemic	LC	
Fabaceae	<i>Neltuma velutina</i>	Not indigenous		
Fabaceae	<i>Neltuma odorata</i>	Not indigenous		
Geraniaceae	<i>Monsonia crassicaulis</i>	Indigenous	LC	
Geraniaceae	<i>Monsonia umbellata</i>	Indigenous, not endemic		
Geraniaceae	<i>Monsonia salmoniflora</i>	Not endemic	LC	
Iridaceae	<i>Moraea venenata</i>	Indigenous	LC	Provincially protected
Kewaceae	<i>Kewa salsoloides</i>	Indigenous, not endemic	LC	
Lamiaceae	<i>Salvia verbenaca</i>	Indigenous, not endemic	LC	
Limeaceae	<i>Limeum aethiopicum</i>	Endemic	LC	
Loranthaceae	<i>Septulina glauca</i>	Endemic	LC	
Malvaceae	<i>Hermannia stricta</i>	Indigenous	LC	
Malvaceae	<i>Radyera urens</i>	Indigenous	LC	
Oxalidaceae	<i>Oxalis annae</i>	Endemic	LC	Provincially protected
Papaveraceae	<i>Argemone ochroleuca</i>	Not indigenous / naturalised / invasive	LC	
Pedaliaceae	<i>Sesamum triphyllum</i>	Indigenous	LC	
Plumbaginaceae	<i>Dyerophytum africanum</i>	Indigenous	LC	
Poaceae	<i>Enneapogon scaber</i>	Indigenous, not endemic	LC	
Poaceae	<i>Eragrostis nindensis</i>	Indigenous	LC	
Poaceae	<i>Stipagrostis ciliata</i>	Indigenous	LC	
Poaceae	<i>Schmidtia kalahariensis</i>	Indigenous	LC	
Poaceae	<i>Aristida congesta</i>	Indigenous, not endemic	LC	
Poaceae	<i>Chloris virgata</i>	Indigenous	LC	
Poaceae	<i>Eragrostis lehmanniana</i>	Indigenous, not endemic	LC	
Poaceae	<i>Enneapogon desvauxii</i>	Indigenous, not endemic	LC	
Poaceae	<i>Cenchrus ciliaris</i>	Indigenous, not endemic	LC	
Polygalaceae	<i>Polygalaceae sp.</i>			
Portulacaceae	<i>Portulaca oleracea</i>	Not indigenous / naturalised / invasive	LC	
Rubiaceae	<i>Nenax sp.</i>			
Rubiaceae	<i>Kohautias p.</i>			
Scrophulariaceae	<i>Aptosimum spinescens</i>	Indigenous	LC	
Scrophulariaceae	<i>Peliostomum leucorrhizum</i>	Indigenous	LC	
Scrophulariaceae	<i>Aptosimum indivisum</i>	Indigenous	LC	
Scrophulariaceae	<i>Zaluzianskya benthamiana</i>	Indigenous	LC	
Solanaceae	<i>Lycium horridum</i>	Indigenous, not endemic	LC	
Solanaceae	<i>Solanum humile</i>	Indigenous, not endemic	LC	
Solanaceae	<i>Lycium cinereum</i>	Indigenous, not endemic	LC	
Solanaceae	<i>Lycium bosciifolium</i>	Indigenous	LC	
Solanaceae	<i>Solanum burchellii</i>	Indigenous	LC	
Verbenaceae	<i>Chascanum pinnatifidum</i>	Indigenous	LC	

Family Name	Scientific Name	RSA Status	Conservation status (Regional)	Notes
Zygophyllaceae	<i>Augea capensis</i>	Indigenous, not endemic	LC	
Zygophyllaceae	<i>Tribulus terrestris</i>	Indigenous, not endemic	LC	
Zygophyllaceae	<i>Tetraena retrofracta</i>	Not endemic	LC	
Zygophyllaceae	<i>Tetraena simplex</i>	Not endemic	LC	
Zygophyllaceae	<i>Roepera lichtensteiniana</i>	Endemic	LC	

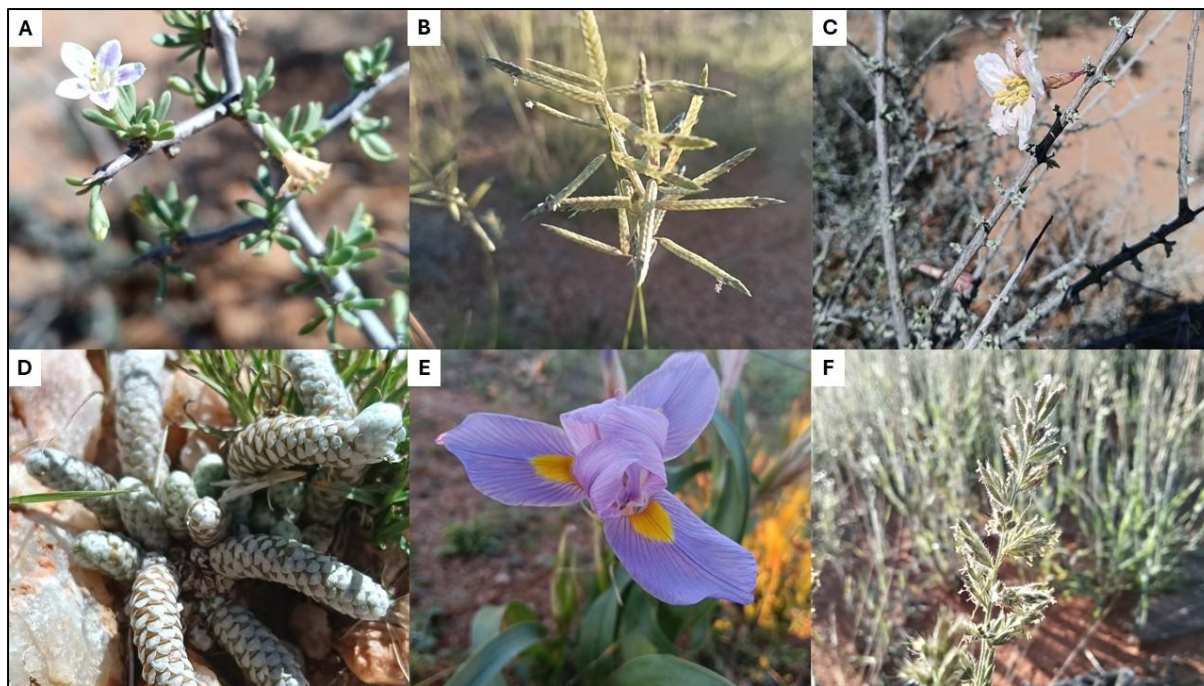


Figure 3-9 Photographs illustrating some of the indigenous species recorded from the PAOI: A – *Lycium cinereum*, B – *Eragrostis nindensis*, C – *Rhigozum trichotomum*, D – *Anacampseros papyracea*, E – *Moraea venenata*, and F – *Schmidtia kalahariensis*

3.2.1.2 Protected Species and Species of Conservation Concern

Three (3) flora SCC were observed of which one (1) is Sensitive Species 545. Two (2) of the flora SCC species (*Anacampseros quinaria* and Sensitive Species 545) were found within the Quartz Outcrops habitat type and were relatively abundant. Some scattered *Aloidendron dichotomum* individuals were observed within the Arid Grassland, Arid Grassland Shrubland Mosaic and Quartz Outcrops habitat types. More individuals are expected within the PAOI. In addition to this, twenty-two (22) provincially protected flora species were recorded. It is likely that more provincially protected species occur within the PAOI. *Hoodia gordonii* was also observed within the PAOI and is Nationally Protected according to the NEMBA (Act 10 of 2004) critically endangered species list (Government Notice R151 in Government Gazette 29657 of 23 February 2007).

See Table 3-6 and Figure 3-9. The SCC and protected species may not be cut, disturbed or destroyed without procuring the appropriate permits to do so. *Aloidendron dichotomum* listed as VU, requires a 200 m no-go buffer. A 15 m no – go buffer has been allocated to the Quartz Outcrop habitat types. This is deemed sufficient to protect *Anacampseros quinaria* and Sensitive Species 545 which were recorded within the Quartz Outcrop habitat type. However, a terrestrial biodiversity walkdown, to allow for micro-siting, and a flora search and rescue plan of the development footprint, for the identification and location of SCC and protected species, is recommended prior to the onset of the development.

Table 3-7 Provincially Protected Species and Species of Conservation Concern recorded within the PAOI. VU = Vulnerable, EN = Endangered, LC = Least Concerned and DDD = Data Deficient Insufficient Information

Family Name	Scientific Name	RSA Status	Regional Conservation Status (SANBI)	Notes
	<i>Sensitive Species 545</i>		VU	Provincially protected
Aizoaceae	<i>Aizoon papulosum</i>	Indigenous, not endemic	LC	Provincially protected
Asphodelaceae	<i>Alroidendron dichotomum</i>	Indigenous	VU	Provincially protected
Anacampserotaceae	<i>Anacampseros filamentosa</i>	Endemic	LC	Provincially protected
Anacampserotaceae	<i>Anacampseros papyracea</i>	Endemic	LC	Provincially protected
Anacampserotaceae	<i>Anacampseros quinaria</i>	Indigenous	EN	Provincially protected
Capparaceae	<i>Boscia foetida</i>	Indigenous / partly endemic at subspecies level	LC	Provincially protected
Aizoaceae	<i>Drosanthemum hispidum</i>	Indigenous	LC	Provincially protected
Euphorbiaceae	<i>Euphorbia rhombifolia</i>	Indigenous, not endemic	LC	Provincially protected
Apocynaceae	<i>Gomphocarpus filiformis</i>	Indigenous	LC	Provincially protected
Apocynaceae	<i>Gomphocarpus filiformis</i>	Not endemic	LC	Provincially protected
Apocynaceae	<i>Hoodia gordonii</i>	Indigenous	DDD	Nationally & Provisionally Protected
Aizoaceae	<i>Mesembryanthemum guerichianum</i>	Indigenous, not endemic	LC	Provincially protected
Aizoaceae	<i>Mesembryanthemum junceum</i>	Endemic	LC	Provincially protected
Aizoaceae	<i>Mesembryanthemum tetragonum</i>	Indigenous, not endemic	LC	Provincially protected
Apocynaceae	<i>Microlooma incanum</i>	Indigenous, not endemic	LC	Provincially protected
Iridaceae	<i>Moraea venenata</i>	Indigenous	LC	Provincially protected
Oxalidaceae	<i>Oxalis annae</i>	Endemic	LC	Provincially protected
Aizoaceae	<i>Ruschia spinosa</i>	Indigenous	LC	Provincially protected
Aizoaceae	<i>Trianthema parvifolium</i>	Indigenous	LC	Provincially protected
Aizoaceae	<i>Trichodiadema setuliferum</i>	Endemic	LC	Provincially protected

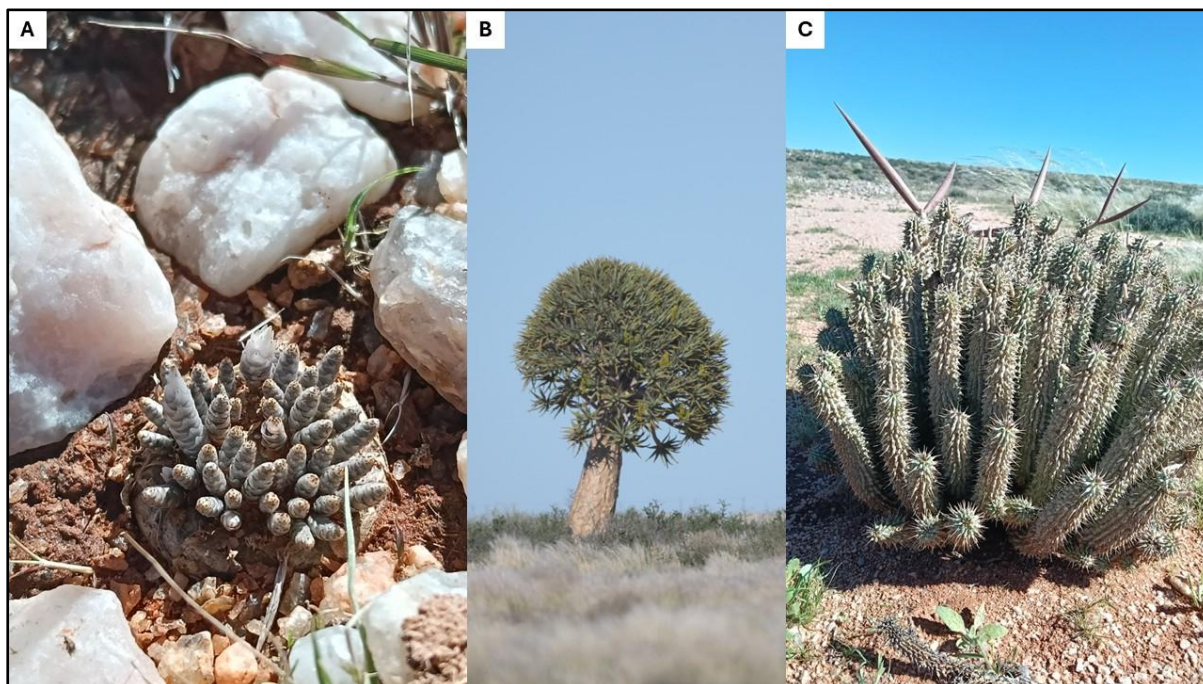


Figure 3-10 Photographs illustrating some of the flora SCC recorded from the PAOI: A – *Anacampseros quinarian*, B – *Aloidendron dichotomum* and C – *Hoodia gordonii*

3.2.1.3 Alien Invasive Plants

Alien Invasive Plants (AIPs) tend to dominate or replace indigenous flora, thereby transforming the structure, composition and functioning of ecosystems. Therefore, it is important that these plants are controlled by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species.

The National Environmental Management: Biodiversity Act (NEMBA) is the most recent legislation pertaining to alien invasive plant species. In August 2014, the list of Alien Invasive Species was published in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (Government Gazette No 78 of 2014). The Alien and Invasive Species Regulations were published in the Government Gazette No. 43726, 18 September 2020. The legislation calls for the removal and / or control of alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse. Below is a brief explanation of the three categories in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA):

- Category 1a: Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
- Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.

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- Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.
- Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

Note that according to the regulations, a person who has under his or her control a category 1b listed invasive species must immediately:

- Notify the competent authority in writing;
- Take steps to manage the listed invasive species in compliance with:
- Section 75 of the Act;
- The relevant invasive species management programme developed in terms of regulation 4; and
- Any directive issued in terms of section 73(3) of the Act.

Eleven (11) AIP species were recorded within the PAOI. Two (2) species are considered as Category 3 in the Northern Cape according to NEMBA (Table 3-8). Two (2) species are considered as Category 1b according to NEMBA (Table 3-8) and must be controlled by implementing an AIP Management Programme, in compliance of section 75 of the NEMBA. These AIP species were mostly concentrated around the modified areas, with *Neltuma* spp. being common along water resources.

Table 3-8 Summary of AIP recorded within the PAOI during the field survey period

Family Name	Scientific Name	Common Name	Alien Status
Amaranthaceae	<i>Chenopodium berlandieri</i>	Pitseed Goosefoot	Naturalised exotic
Amaranthaceae	<i>Amaranthus albus</i>	Prostrate Pigweed	Naturalised exotic
Amaranthaceae	<i>Chenopodium murale</i>	Nettle-leaved Goosefoot	Naturalised exotic
Amaranthaceae	<i>Atriplex lindleyi</i>	Lindley's Saltbush	Naturalised exotic
Anacardiaceae	<i>Schinus molle</i>	Peruvian Pepper Tree	Naturalised exotic
Cactaceae	<i>Opuntia cespitosa</i>	Eastern Pricklypear	NEMBA Category 1b
Fabaceae	<i>Neltuma velutina</i>	Velvet Mesquite	NEMBA Category 3 in NC
Fabaceae	<i>Neltuma odorata</i>	Western Honey Mesquite	NEMBA Category 3 in NC
Papaveraceae	<i>Argemone ochroleuca</i>	Mexican Poppy	NEMBA Category 1b
Portulacaceae	<i>Portulaca oleracea</i>	Common Purslane	Naturalised / invasive
Lamiaceae	<i>Salvia verbenaca</i>	Wild Clary	Naturalised exotic

Considering that the PAOI includes sensitive habitats, it is recommended that any AIP species that may colonise the area in the future be controlled by implementing an AIP Management Programme in compliance of section 75 of the Act as stated above. This is also pertinent to the development as invasive species are linked to enhanced fire effects and risk (Aslan & Dickson, 2020). The AIP Management Programme must implement the following monitoring framework must be implemented to ensure that AIPs are continually monitored, and progress pertaining to their control is recorded (Table 3-9). The monitoring of the PAOI throughout the process is crucial to prevent AIPs growing and

spreading out of control, thereby threatening the wellbeing of indigenous flora and fauna. It is also important to note that while herbicide application has been recommended for control, herbicides should not be applied adjacent to the aquatic ecosystems within the site area and herbicide application should not be used during windy days to prevent drift.

Table 3-9 ***Proposed monitoring framework for the control of alien invasive plants within the PAOI***

Metric	Frequency	Method	Response
How effective are the control methods?	4-6 months after every operation	Survey the cleared areas and look for regrowth. Before and after photographs are effective for this. Observe for non-target effects of herbicide application.	If the survey reveals that the control methods are effective, e.g., low levels of re-sprouting, continue following the herbicide mixtures and control methods. If non-target plants are dying off where herbicides were applied, ensure appropriate training for herbicide applicators, demonstrate the off-target effects to herbicide applicators to ensure they are using the correct methods and herbicides. (If the results show that the control methods are not effective, adapt by e.g., cutting lower above ground or changing herbicides or timing of herbicide application.
Do the infestation levels decrease?	Annually	Survey the cleared areas and record species, densities and size. Before and after pictures are very effective.	If the infestation levels are not decreasing, reconsider clearing intervals and look at clearing methods. If infestation levels are decreasing, then continue current control method.
Quantity of herbicides used	During every operation	Keep track of cost and ensure no wastage. Record herbicide usage	Track usage over time, it will reveal a certain trend in quantities for different infestation levels. Less herbicides should be used when the infestation levels are lower. Record herbicide cost.
Does the indigenous vegetation recover in the cleared areas?	Annually	Survey the cleared areas and look out for indigenous species variety and presence. Before and after pictures are effective.	If there is recovery of indigenous vegetation, then continue current control method. If there is no recovery, consider rehabilitation with local indigenous species.
How many jobs were created?	After every operation	Timesheets	Job creation figures are useful when asking for landowner assistance from WFW or to demonstrate contributions to jobs and socio-economic conditions
How many person days (PD) were spent per operations?	After every operation	Timesheets	Keep track of cost and assist with planning and budgeting. Determine cost per person per day (PD)

3.2.2 Fauna Assessment

Non-volant mammal, avifauna and herpetofauna observations and recordings fall under this section.

3.2.2.1 Mammals

Ten (10) mammal species were recorded from the PAOI (Table 3-10 and Figure 3-11). Extensive sampling would be required to yield a higher number of observations; however, common mammal species are expected for the area. Five (5) of these species are protected provincially.

Table 3-10 The mammal species observed within the PAOI

Family	Scientific Name	Common Name	Regional Conservation Status (SANBI)	Global Conservation Status (IUCN)	Notes
Bovidae	<i>Antidorcas marsupialis</i>	Springbok	LC	LC	Provincially Protected
Bovidae	<i>Raphicerus campestris</i>	Steenbok	LC	LC	Provincially Protected
Canidae	<i>Otocyon megalotis</i>	Bat-eared Fox	LC	LC	
Herpestidae	<i>Suricata suricatta</i>	Meerkat	LC	LC	Provincially Protected
Herpestidae	<i>Cynictis penicillata</i>	Yellow Mongoose	LC	LC	Provincially Protected
Hyaenidae	<i>Proteles cristata</i>	Aardwolf	LC	LC	
Leporidae	<i>Lepus saxatilis</i>	Scrub Hare	LC	LC	Provincially Protected
Muridae	<i>Micaelamys namaquensis</i>	Namaqua Rock Rat	LC	LC	
Orycteropodidae	<i>Orycteropus afer</i>	Aardvark	LC	LC	
Sciuridae	<i>Xerus inauris</i>	Ground Squirrel	LC	LC	

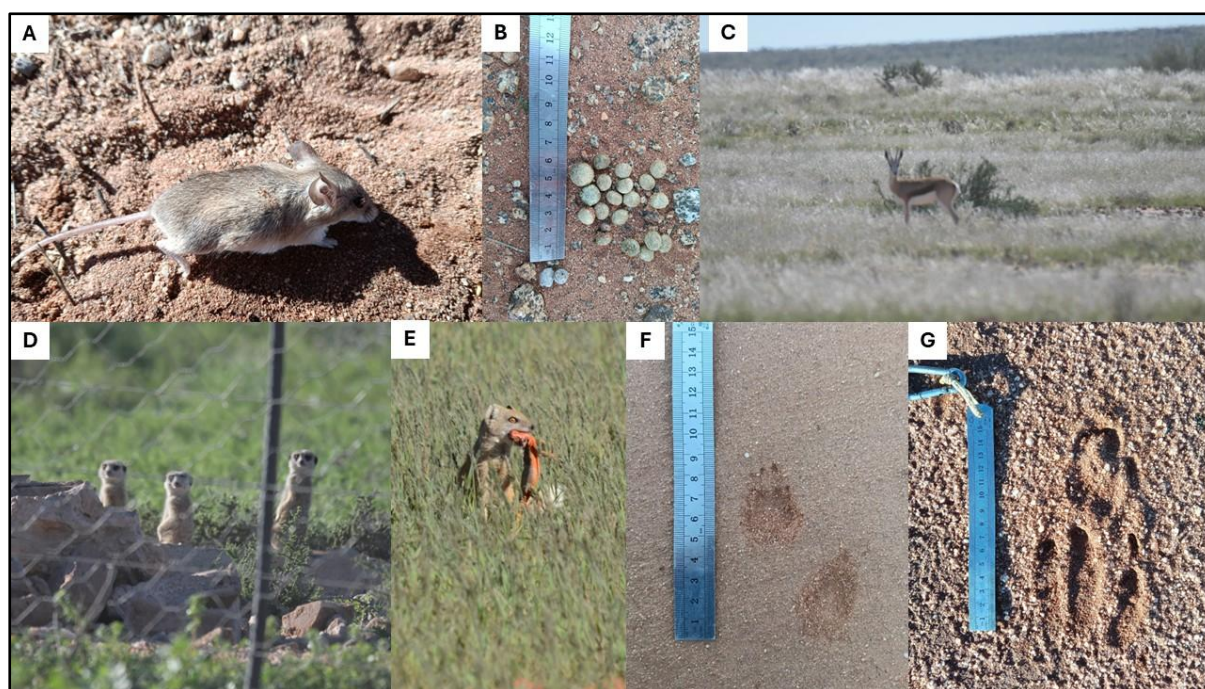


Figure 3-11 Some of the mammal species observed within the PAOI: A – *Micaelamys namaquensis*, B – *Lepus saxatilis*, C – *Antidorcas marsupialis*, D – *Suricata suricatta* E – *Cynictis penicillata*, F – *Otocyon megalotis* and G – *Orycteropus afer*

3.2.2.2 Herpetofauna

Six (6) reptile species were observed of which the Northern Tent Tortoise (*Psammobates tentorius verroxii*) is considered SCC (Table 3-11 and Figure 3-12). One (1) amphibian species was recorded within the PAOI (Table 3-11 and Figure 3-12). The Giant Bullfrog (*Pyxicephalus adspersus*) was observed within a depression wetland within the PAOI and is Nationally Protected according to the NEMBA (Act 10 of 2004) critically endangered species list (Government Notice R151 in Government Gazette 29657 of 23 February 2007). Extensive sampling would be required to yield a higher number of observations; however, more common reptile and amphibian species are expected for the PAOI.

Table 3-11 Herpetofauna observed within the PAOI

Family	Scientific Name	Common Name	Regional Conservation Status (SANBI)	Global Conservation Status (IUCN)	Notes
Reptile					
Gekkonidae	<i>Chondrodactylus bibronii</i>	Bibron's Thick-toed Gecko	LC	LC	
Lacertidae	<i>Pedioplanis lineoocellata</i>	Spotted Sand Lizard	LC	LC	
Psammophiidae	<i>Psammophylax rhombeatus</i>	Spotted Skaapsteker	LC	LC	
Scincidae	<i>Trachylepis occidentalis</i>	Western Three-striped Skink	LC	LC	
Scincidae	<i>Trachylepis sulcata</i>	Western Rock Skink	LC	LC	
Testudinidae	<i>Psammobates tentorius verroxii</i>	Northern Tent Tortoise	NT	NT	Provincially Protected
Amphibian					
Pyxicephalidae	<i>Pyxicephalus adspersus</i>	Giant Bullfrog	LC	LC	Nationally and Provincially Protected

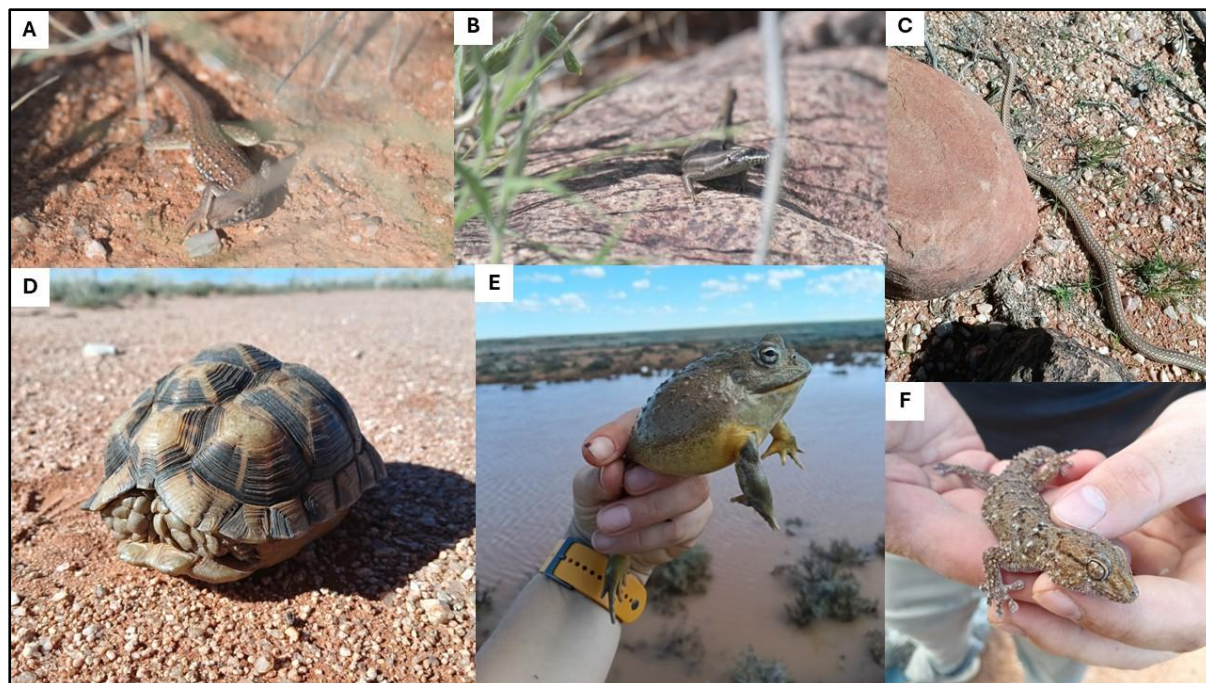


Figure 3-12 Some of the herpetofauna species observed within the PAOI: A – *Pedioplanis lineoocellata*, B – *Trachylepis sulcata*, C – *Psammophis notostictus*, D – *Psammobates tentorius subsp. verroxii*, E – *Pyxicephalus adspersus* and F – *Chondrodactylus bibronii*

3.2.2.3 Avifauna

3.2.2.3.1 Species Lists

Seven (7) avifauna SCC were recorded within or close to the PAOI during this assessment. Due to suitable habitat and existing occurrence data, many SCC are expected. Access was also restricted at certain points bordering the PAOI. Therefore, an avifauna walkdown by an appropriately qualified avifauna specialist is recommended prior to commencement of development activities. Avifauna species were recorded from the PAOI and can be seen presented in Table 3-12.

Table 3-12 Table presenting the main avifauna species recorded from the PAOI

Common Name	Scientific Name	Family Name	Relative abundance	Frequency of occurrence (%)
Lark-like Bunting	<i>Emberiza impetuani</i>	Emberizidae	0,266	75,000
Namaqua Sandgrouse	<i>Pterocles namaqua</i>	Pteroclididae	0,249	37,500
Black-eared Sparrow-lark	<i>Eremopterix australis</i>	Alaudidae	0,148	33,333
Namaqua Dove	<i>Oena capensis</i>	Columbidae	0,033	12,500
Spike-heeled Lark	<i>Chersomanes albofasciata</i>	Alaudidae	0,033	16,667
Karoo Prinia	<i>Prinia maculosa</i>	Cisticolidae	0,027	25,000
Rufous-eared Warbler	<i>Malcorus pectoralis</i>	Cisticolidae	0,027	33,333
Karoo Korhaan	<i>Eupodotis vigorsii</i>	Otididae	0,024	12,500
Karoo Long-billed Lark	<i>Certhilauda subcoronata</i>	Alaudidae	0,024	29,167
Red-billed Teal	<i>Anas erythrorhyncha</i>	Anatidae	0,024	4,167
Dusky Sunbird	<i>Cinnyris fuscus</i>	Nectariniidae	0,015	12,500
Pied Crow	<i>Corvus albus</i>	Corvidae	0,012	8,333
Three-banded Plover	<i>Charadrius tricollaris</i>	Charadriidae	0,012	8,333
Grey-backed Sparrow-lark	<i>Eremopterix verticalis</i>	Alaudidae	0,012	8,333
Cape Teal	<i>Anas capensis</i>	Anatidae	0,012	4,167
Ring-necked Dove	<i>Streptopelia capicola</i>	Columbidae	0,009	12,500
Mountain Wheatear	<i>Myrmecocichla monticola</i>	Muscicapidae	0,009	8,333
Pirit Batis	<i>Batis pirit</i>	Platysteiridae	0,006	8,333
Ludwig's Bustard	<i>Neotis ludwigii</i>	Otididae	0,006	4,167
Double-banded Courser	<i>Rhinoptilus africanus</i>	Glareolidae	0,006	8,333
Northern Black Korhaan	<i>Afrotis afraoides</i>	Otididae	0,006	8,333
Eastern Clapper Lark	<i>Mirafra fasciolata</i>	Alaudidae	0,006	4,167
Speckled Pigeon	<i>Columba guinea</i>	Columbidae	0,006	4,167
Southern Masked Weaver	<i>Ploceus velatus</i>	Ploceidae	0,006	4,167
Acacia Pied Barbet	<i>Tricholaema leucomelas</i>	Lybiidae	0,003	4,167
Bokmakierie	<i>Telophorus zeylonus</i>	Malaconotidae	0,003	4,167
Southern Fiscal	<i>Lanius collaris</i>	Laniidae	0,003	4,167
Black-headed Heron	<i>Ardea melanocephala</i>	Ardeidae	0,003	4,167
Sabota Lark	<i>Calendulauda sabota</i>	Alaudidae	0,003	4,167

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Large Rock Martin	<i>Ptyonoprogne fuligula</i>	Hirundinidae	0,003	4,167
Kalahari Scrub Robin	<i>Cercotrichas paena</i>	Muscicapidae	0,003	4,167
Karoo Scrub Robin	<i>Cercotrichas coryphoeus</i>	Muscicapidae	0,003	4,167
Cape Sparrow	<i>Passer melanurus</i>	Passeridae	0,003	4,167

3.2.2.3.1.1 Risk Species

The following risk species are species that would be affected by disturbance and habitat loss (Table 3-13).

Table 3-13 Risk species observed in the PAOI for the prospecting

Common Name	Scientific Name	Family Name	Regional	Global
Black Harrier	<i>Circus maurus</i>	Accipitridae	EN	EN
Karoo Korhaan	<i>Eupodotis vigorsii</i>	Otididae	NT	LC
Lanner Falcon	<i>Falco biarmicus</i>	Falconidae	NT	LC
Lappet-faced Vulture	<i>Torgos tracheliotos</i>	Accipitridae	CR	EN
Greater Kestrel	<i>Falco rupicoloides</i>	Falconidae	LC	LC
Kori Bustard	<i>Ardeotis kori</i>	Otididae	NT	NT
Ludwig's Bustard	<i>Neotis ludwigii</i>	Otididae	EN	EN
Northern Black Korhaan	<i>Afrotis afraoides</i>	Otididae	LC	LC
Red-billed Teal	<i>Anas erythrorhyncha</i>	Anatidae	NT	LC
White-backed Vulture	<i>Gyps africanus</i>	Accipitridae	CR	CR

3.2.2.3.1.2 Trophic Guilds

Trophic guilds are defined as a group of species that exploit the same class of environmental resources in a similar way (González-Salazar *et al*, 2014). The guild classification used in this assessment is as per González-Salazar *et al* (2014); they divided avifauna into major groups based on their diet, habitat, and main area of activity. Although species tend to exhibit varied diets, with invertivores consuming fruit and frugivores consuming insects, for example, the dominant composition of the diet was considered.

The analysis of the major avifaunal guilds reveals that the species composition during the survey was dominated by Invertivore Ground Diurnal (IGD) birds, followed by Granivore Ground Diurnal (GGD), Carnivore Ground Diurnal (CGD) and Omnivore Ground Diurnal (OGD) (Figure 3-13).

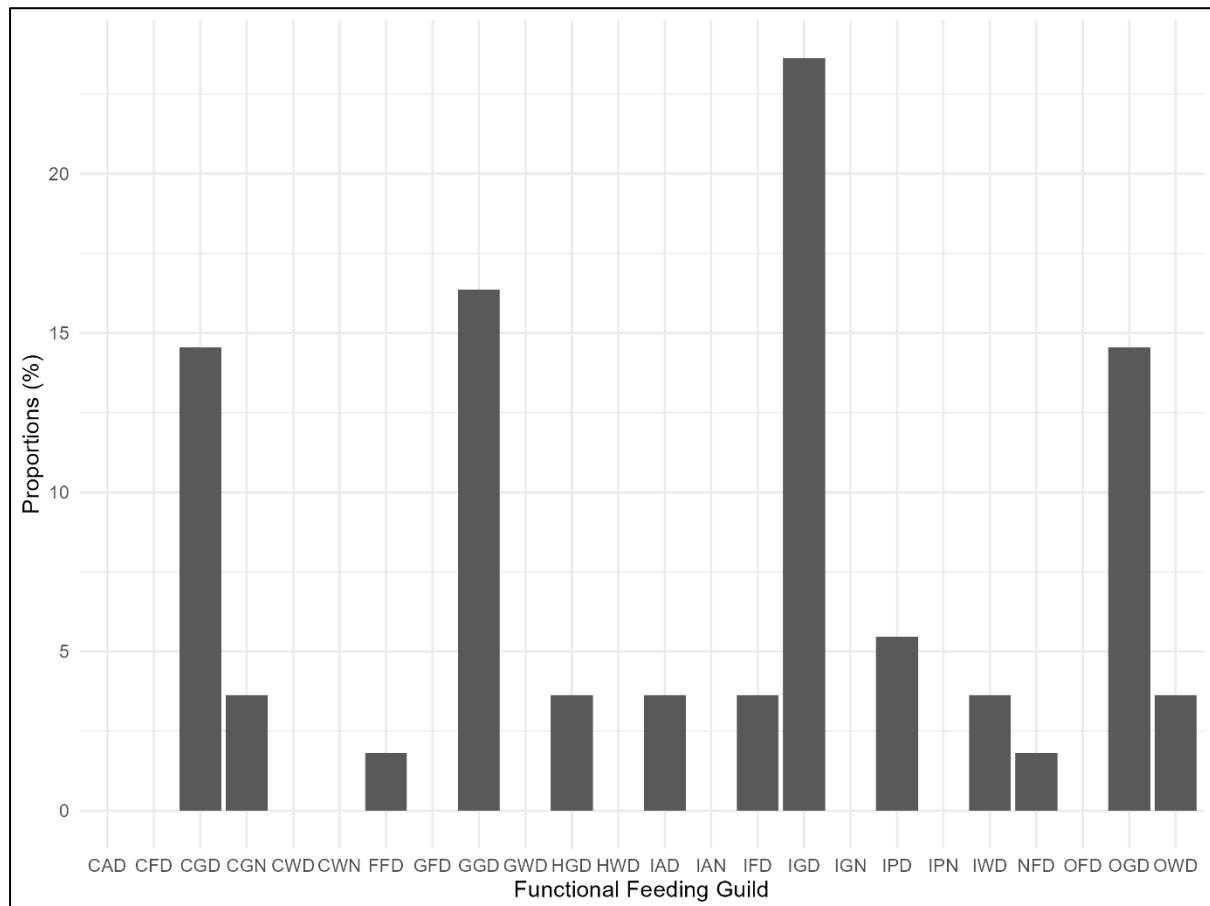


Figure 3-13 Column plot illustrating the proportion of each Functional Feeding Guild to the total abundance. Avifaunal trophic guilds – CGD, carnivore ground diurnal; CGN, carnivore ground nocturnal; CWD, carnivore water diurnal; CWN, carnivore water nocturnal; CFD, carnivore foliage diurnal; CAD, carnivore air nocturnal; FFD, frugivore foliage diurnal; GGD, granivore ground diurnal; GWD, granivore water diurnal; GFD, granivore foliage diurnal; HGD, herbivore ground diurnal; HWD, herbivore water diurnal; IGD, invertivore ground diurnal; IWD, invertivore, water diurnal; IGN, invertivore ground nocturnal; IFD, invertivore foliage diurnal; IPD, invertivore perch diurnal; IPN, invertivore perch nocturnal; IAD, invertivore air diurnal; IAN, invertivore air nocturnal; NFD, nectivore foliage diurnal; OGD, omnivore ground diurnal; OWD, omnivore water diurnal; OFD, omnivore foliage diurnal.

3.2.2.3.2 Nest Analysis

Three nests were recorded, that of three Pied Crows. None of these species is SCCs; however, based on the high number of SCC recorded and known to occur in the area, a nest walkdown would be required before site clearance.

3.2.2.3.3 Flight Analysis

Flight paths were recorded, but due to the nature of this project and no specific flight path corridors being noted during the field survey, the impact is low.

3.3 Habitat Assessment

The main habitat types identified across the PAOI were initially delineated largely based on aerial imagery. These main habitat types were then refined based on the field coverage and data collected during the late wet season assessment (13 – 16 April 2026). Emphasis was placed on limiting timed meander searches within the most functional habitats, and therefore habitats with a higher potential of hosting SCC.

Given the extent of the PAOI, as well as access and time constraints, the habitat assessment focused on identifying the major habitat types. Areas to which access was not possible were assessed primarily using desktop information and satellite imagery, with interpretations based on observations from surrounding areas that were surveyed, together with prior knowledge of the broader landscape. The habitat assessment should therefore be interpreted in this context.

Six (6) major terrestrial habitats, and a set of Water Resources (three habitats, as defined by the Freshwater Specialist), were identified across the PAOI. The majority of the PAOI consists of Arid Grassland Shrubland Mosaic habitat type. The condition of this habitat varied across the PAOI due to different levels of grazing impacts, possible rotation grazing as well as possible differences in rain received across the PAOI. Other terrestrial habitats identified include Arid Grassland, Rocky Arid Grassland Shrubland Mosaic, Quartz Outcrops, Rocky Outcrops and Modified.

The habitat units for the PAOI can be seen delineated in Figure 3-14. Descriptions of the habitat units can be found in Table 3-14.

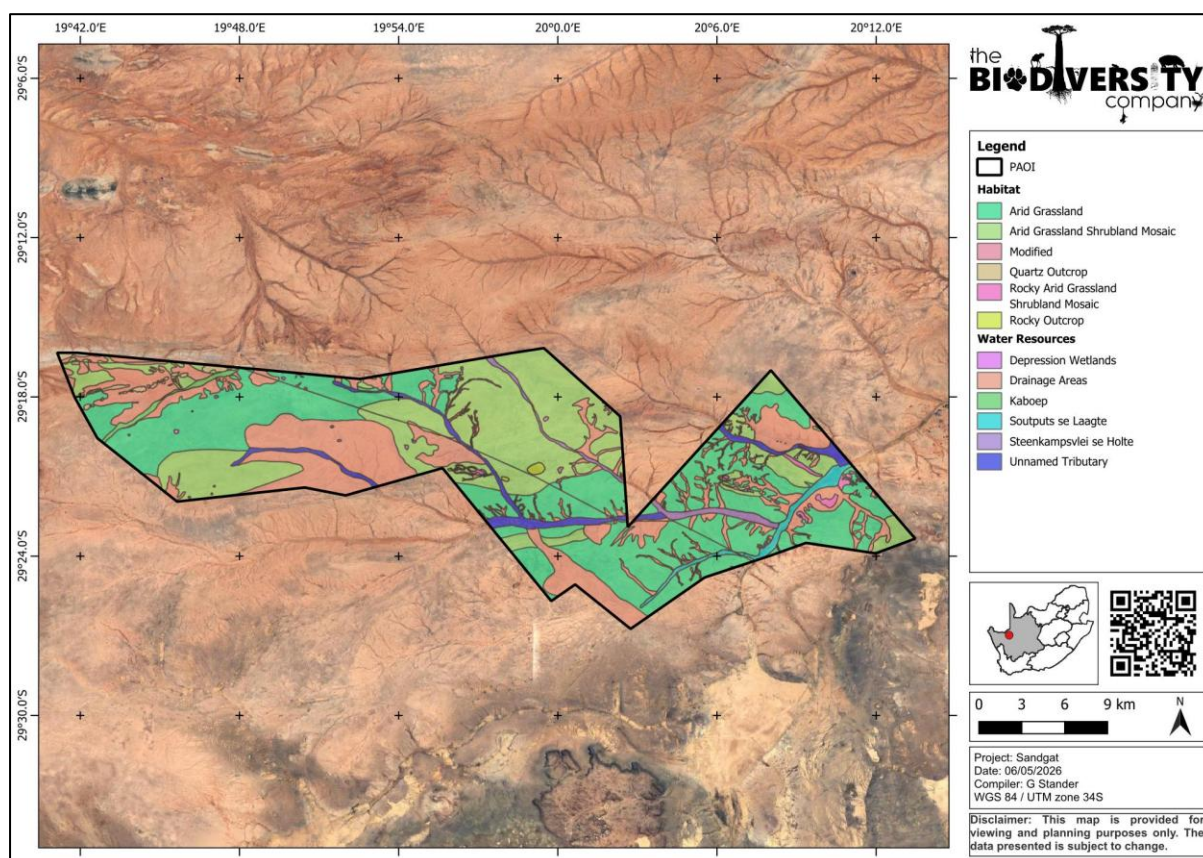


Figure 3-14 Map of the habitats delineated for the PAOI

Table 3-14 Table providing descriptions of the habitat types delineated for the PAOI

Habitat	Description and condition	Condition	Ecosystem Processes and Services
Arid Grassland 18065.236 ha	<p>This habitat consists of extensive arid plains, dominated by grasses. Shrubs occur in the ecotone between the Arid Grassland habitat and the Arid Grassland Shrubland Mosaic habitat. This habitat unit has a gravelly substrate mostly being quartz. Dominant grass and herb species recorded included <i>Stipagrostis ciliata</i>, <i>Aristida congesta</i>, <i>Enneapogon scaber</i>, <i>Acanthopsis hoffmannseggiana</i> and <i>Schmidtia kalahariensis</i>.</p> <p>This habitat unit is mostly natural however condition varied throughout the PAOI due to differences in grazing pressure and most likely difference in rain received throughout the PAOI. Disturbances observed include grazing by livestock and the edge effects associated with roads and kraals.</p> <p>This habitat supports indigenous fauna and flora. Scattered <i>Aloidendron dichotomum</i> (VU) (flora SCC) individuals were observed within this habitat. The reptile SCC <i>Psammobates tentorius veroxii</i> (classified as NT regionally and globally) is expected to occur in this habitat</p> <p>Avifauna species expected to occur here include: Black Harrier, Burchell's Courser, Karoo Korhaan, Lappet-faced Vulture (possibly), White-backed Vulture (possibly), .Ludwig's Bustard, Red Lark and Secretarybird,</p>	Natural	<p>Contributes to conservation targets and provides important habitat, refuge, grazing, and foraging for indigenous fauna and livestock. It supports water filtration, erosion control, pollination, and seed dispersal, while also serving as a movement corridor and key nesting and foraging habitat for fauna across multiple life stages. This habitat provides breeding and foraging resources for Avifauna, with vultures possibly occurring here in the event of livestock mortalities.</p>





<p>Arid Grassland Shrubland Mosaic</p>	<p>This habitat consists of extensive arid plains, dominated by grasses and shrubs. Shrub density varies across the habitat with some areas having scattered shrubs compared to other areas where shrubs are denser. The difference in shrub density could be due to grazing pressure difference throughout the PAOI. In addition to this, ecotone areas between the Arid Grassland Shrubland Mosaic and Water Resources proved to have a higher density of shrubs. This habitat unit has a gravelly substrate mostly being quartz. Dominant grass and herb species recorded included <i>Stipagrostis ciliata</i>, <i>Aristida congesta</i>, <i>Enneapogon scaber</i>, <i>Acanthopsis hoffmannseggiana</i> and <i>Schmidtia kalahariensis</i>. Dominant shrubs observed included <i>Lycium</i> spp., <i>Roepera lichtensteiniana</i> and <i>Rhigozum trichotomum</i>.</p>	<p>Natural</p>
<p>13216.861 ha</p>	<p>This habitat unit is mostly natural however condition varied throughout the PAOI due to differences in grazing pressure and most likely difference in rain received throughout the PAOI. Disturbances observed include grazing by livestock and the edge effects associated with roads and kraals.</p> <p>This habitat supports indigenous fauna and flora. Scattered <i>Alouidendron dichotomum</i> (VU) (flora SCC) individuals were observed within this habitat. The reptile SCC <i>Psammobates tentorius veroxii</i> (classified as NT regionally and globally) was observed within this habitat.</p> <p>Avifauna species expected to occur here include Black Harrier, Burchell's Courser, Karoo Korhaan, Lappet-faced Vulture, White-backed Vulture, Ludwig's Bustard, Martial Eagle and Secretarybird,</p>	<p>Provides grazing and foraging resources for indigenous fauna and livestock. Aids in the filtration of water permeating through the soil into the drainage areas. May act as a movement corridor for fauna within the landscape. Provides habitat for fauna SCC and flora SCC. Vultures could possibly occur here in the event of livestock mortalities.</p>



**Rocky Arid
Grassland
Shrubland
Mosaic**

282.365 ha

The habitat is rockier than the Arid Grassland Shrubland Mosaic consisting of larger scattered rocks and dense gravel – like soil. It is mostly found adjacent the Quartz Outcrop and Rocky Outcrop habitat types and is slightly more elevated than the Arid Grassland Shrubland Mosaic with bare open patches being common.

Dominant shrubs recorded included *Lycium* spp. and *Rhigozum trichotomum*. Dominant grasses recorded include *Schmidtia kalahariensis*, *Enneapogon scaber* and *Stipagrostis ciliata*.

This habitat unit is mostly natural however condition varied throughout the PAOI due to differences in grazing pressure and most likely difference in rain received throughout the area. Disturbances observed include grazing by livestock, human ingress and the edge effects associated with roads and kraals.

This habitat supports indigenous fauna and flora and flora SCCs are expected. The reptile SCC *Psammobates tentorius veroxii* (classified as NT regionally and globally) was observed within this habitat.

Natural

Provides grazing and foraging resources for indigenous fauna and livestock. Aids in the filtration of water permeating through the soil into the drainage areas. May act as a movement corridor for fauna within the landscape. Provides habitat for fauna SCC and potential flora SCC. The Sclater's Lark possibly occurs here but prefers a rock with a darker surface (refer to the third image). There are adequate open spaces for larger birds to forage and breed.

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Avifauna species expected to occur here include: Black Harrier, Burchell's Courser, Karoo Korhaan, Kori Bustard, Lanner Falcon, Lappet-faced Vulture, Ludwig's Bustard, Sclater's Lark, Secretarybird and White-backed Vulture.





**Quartz
Outcrop**

278.912 ha

This habitat consists of elevated quartz areas and is considered to have low resilience to impacts.

Indigenous species include *Microloma incanum*, *Aloe claviflora*, *Crassula sericea*, *Anacampseros papyracea*, *Kleinia longiflora*, *Aloe gariepensis*, *Bulbine* spp., and *Hoodia gordonii*.

Indigenous flora and fauna species are supported by this habitat. Scattered *Aloidendron dichotomum* (VU) (flora SCC) individuals were observed within this habitat. *Anacampseros quinaria* (EN) and Sensitive Species 545 (VU) were abundant within this habitat. Fauna SCCs are expected to make use of this habitat.

Avifauna species likely to occur here: Lanner Falcon and Verreaux's Eagle (will only forage here).

Natural

This habitat provides suitable habitat, microhabitats, unique quartz habitat and niche environments capable of supporting fauna and flora SCC, especially succulents, and cryptic species, specifically reptile species. Provides refuge from extreme environmental factors, such as heat and drought. Aids in soil stabilisation, water regulation, nutrient cycling, and seed bank protection. Serve as movement corridors and 'stepping stones' for species moving between larger habitat patches. Lanner Falcon could utilise the scattered *Aloidendron dichotomum* and rocks for perching and as a vantage point for when it hunts.



Rocky Outcrop	107.458 ha	Natural	<p>This habitat consists of rocky outcrops and is considered to have a low resilience to impacts.</p> <p>Dominant shrubs recorded included <i>Lycium</i> spp. Dominant grasses recorded include <i>Schmidtia kalahariensis</i>, <i>Enneapogon scaber</i> and <i>Stipagrostis ciliata</i>. Buffalo grass</p> <p>Indigenous flora and fauna species are supported by this habitat. No fauna or flora SCCs were observed, but are expected.</p> <p>Avifauna species expected to occur here: Lanner Falcon and Verreaux's Eagle (will forage here).</p>	<p>This habitat provides suitable habitat, microhabitats, unique quartz habitat and niche environments capable of supporting fauna and flora SCC, especially succulents, and cryptic species, specifically reptile species. Provides refuge from extreme environmental factors, such as heat and drought. Aids in soil stabilisation, water regulation, nutrient cycling, and seed bank protection. Serve as movement corridors and 'stepping stones' for species moving</p>

between larger habitat patches. Lanner Falcon could utilise the rocks for perching and as a vantage point for when it hunts.



Modified
61.709 ha

This habitat unit includes all areas that maintain little to no native vegetation and/or where anthropogenic activity has substantially modified an area’s primary ecological functions and species composition. This habitat unit no longer maintains its functional integrity and does not contribute significantly to ecosystem services. This habitat consists of major roads, houses and associated infrastructure.

Fauna and flora SCC are unlikely to occur in this habitat unit. Some fauna SCC could potentially move through these areas or utilise the water provided for livestock occasionally.

Avifauna species expected to occur here include Lanner Falcon.

Modified

The ecological services provided by this habitat are limited due to the extent of land transformation and the large amount of bare ground. May function as a movement corridor for some fauna species. Smaller raptors will perch on fences, but the habitat is otherwise unsuitable for other avifauna SCC.



Water Resources:	This non-terrestrial habitat unit is composed of depression wetland, drainage areas, unnamed tributaries and various rivers (Kaboep, Soutputs se Laagte and Steenkampsvlei se Holte).		Assists in regulating microclimate and water quality and provides foraging for local fauna and provides habitat for terrestrial, amphibious and aquatic organisms.
River 1468.553 ha			Burchell's Coursers can likely be observed within dry riverbeds (Hockey and Douie 1995, Maclean and Herremans 1997). The variety of water resources accompanied by good rains mean that Hamerkop and Red-billed Teal can also occur here.
Unnamed Tributaries 1324.804 ha	Indigenous species include <i>Caroxylon aphyllum</i> , <i>Lycium</i> spp. <i>Augea capensis</i> , <i>Mesembryanthemum guerichianum</i> , <i>Pteronia ciliata</i> , and <i>Schmidtia kalahariensis</i> . The AIP species, <i>Neltuma</i> spp., were common along rivers and tributaries.	Natural	
Depression Wetlands 72.636 ha	This habitat it is inherently sensitive. More information can be found in the accompanying Aquatic Impact Assessment (TBC, 2026).		
Drainage Areas 12121.303 ha	Avifauna species expected to occur here include: Burchell's Courser, Hamerkop and Red-billed Teal.		



3.4 Site Ecological Importance

Based on the criteria provided in Appendix B of this report, all habitats within the PAOI were assigned a sensitivity category, i.e., a SEI category. The PAOI was categorised as possessing habitats with areas ranging from Very Low to High SEI.

Please note that the Water Resource habitat is a non-terrestrial habitat and was assessed from a terrestrial perspective only. The accompanying Aquatic Impact Assessment must be referenced for Water Resource sensitivities and buffers. ***It is important to note these sensitivities are based solely on prospecting and does not reflect the sensitivities of mining.***

3.4.1 Terrestrial Site Ecological Importance

Table 3-15 indicates the SEI categories for the PAOI from a terrestrial, flora and fauna perspective (excluding avifauna) and is illustrated in Figure 3-15.

Table 3-15 Summary of habitat types delineated within field assessment area from a terrestrial, flora and fauna perspective (excluding avifauna)

Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
	Medium	Medium		Medium	Medium
Arid Grassland	> 50% of receptor contains natural habitat with potential to support SCC	Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	Medium	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
	Medium	Medium		Medium	Medium
Arid Grassland Shrubland Mosaic	> 50% of receptor contains natural habitat with potential to support SCC	Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	Medium	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
	Medium	Medium		Medium	Medium
Rocky Arid Grassland Shrubland Mosaic	> 50% of receptor contains natural habitat with potential to support SCC	Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	Medium	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
	Medium	High		Very Low	High
Quartz Outcrop	Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or	Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches.	Medium	Habitat that is unable to recover from major impacts	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset

Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
	more than 10 000 mature individuals.	Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation potential.			mitigation may be required for high impact activities.
Rocky Outcrop	Medium	High	Medium	Very Low	High
	Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.	Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches. Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation potential.		Habitat that is unable to recover from major impacts	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Modified	Low	Low	Low	High	Very Low
	No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species.	Several minor and major current negative ecological impacts.		Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.
Water Resources: Kaboep, Soutputs se Laagte, Steenkampsvlei se Holte, Unnamed Tributary and Depression Wetlands	Medium	High	Medium	Low	High
	> 50% of receptor contains natural habitat with potential to support SCC.	Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation potential		Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable
	Medium	High	Medium	Medium	Medium

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Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
Water Resource: Drainage Area	> 50% of receptor contains natural habitat with potential to support SCC	Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation potential		Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable

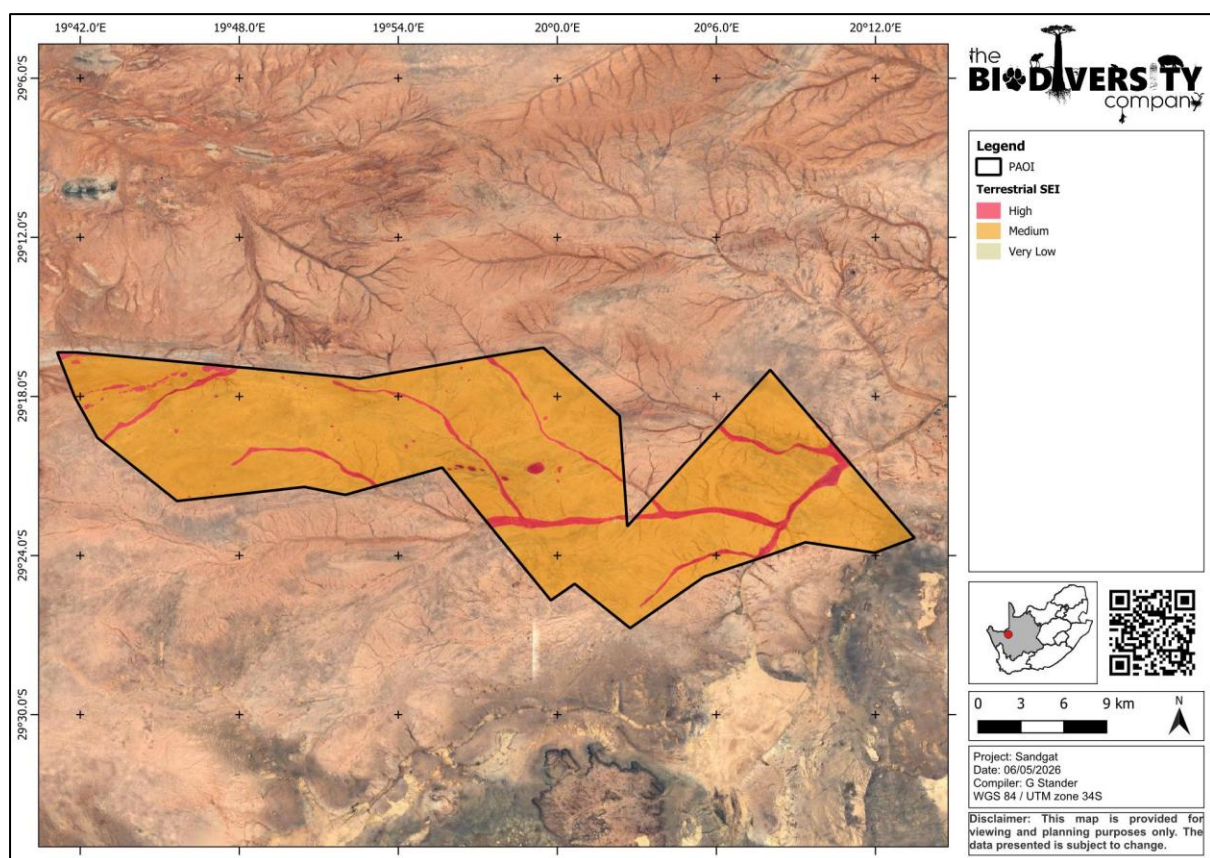


Figure 3-15 Site Ecological Importance of the PAOI for terrestrial (excluding avifauna)

3.4.2 Avifauna Site Ecological Importance

Table 3-16 indicates the SEI categories for the PAOI from an avifauna perspective and is illustrated in Figure 3-16.

Table 3-16 Avifauna sensitivities for all the various habitats

Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
Arid Grassland	High	Medium	Medium	Medium	Medium

Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.		Species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Arid Grassland Shrubland Mosaic	High	Medium	Medium	Medium	Medium
	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.		Species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Rocky Arid Grassland Shrubland Mosaic	High	Medium	Medium	Low	High
	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	Mostly minor current negative ecological impacts with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.		Species that have a low likelihood of returning to a site once the disturbance or impact has been removed.	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable.
Quartz Outcrop	Medium	High	Medium	Low	High
	Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.	Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches. Only minor current negative ecological impacts, with no		Species that have a low likelihood of returning to a site once the disturbance or impact has been removed.	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable.

Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
		signs of major past disturbance and good rehabilitation potential.			
Rocky Outcrop	Medium	High	Medium	Low	High
	Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.	Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches. Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation potential.		Species that have a low likelihood of returning to a site once the disturbance or impact has been removed.	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable.
Modified	Medium	Low	Low	High	Very Low
	Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.	Several minor and major current negative ecological impacts.		Species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.
Water Resources: Kaboep, Soutputs se Laagte, Steenkampsveise Holte, Unnamed Tributary and Depression Wetlands	High	High	High	Medium	High
	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation potential		Species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable.
	Medium	High	Medium	Medium	Medium

Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
Water Resource: Drainage Area	Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.	Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation potential		Species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable.

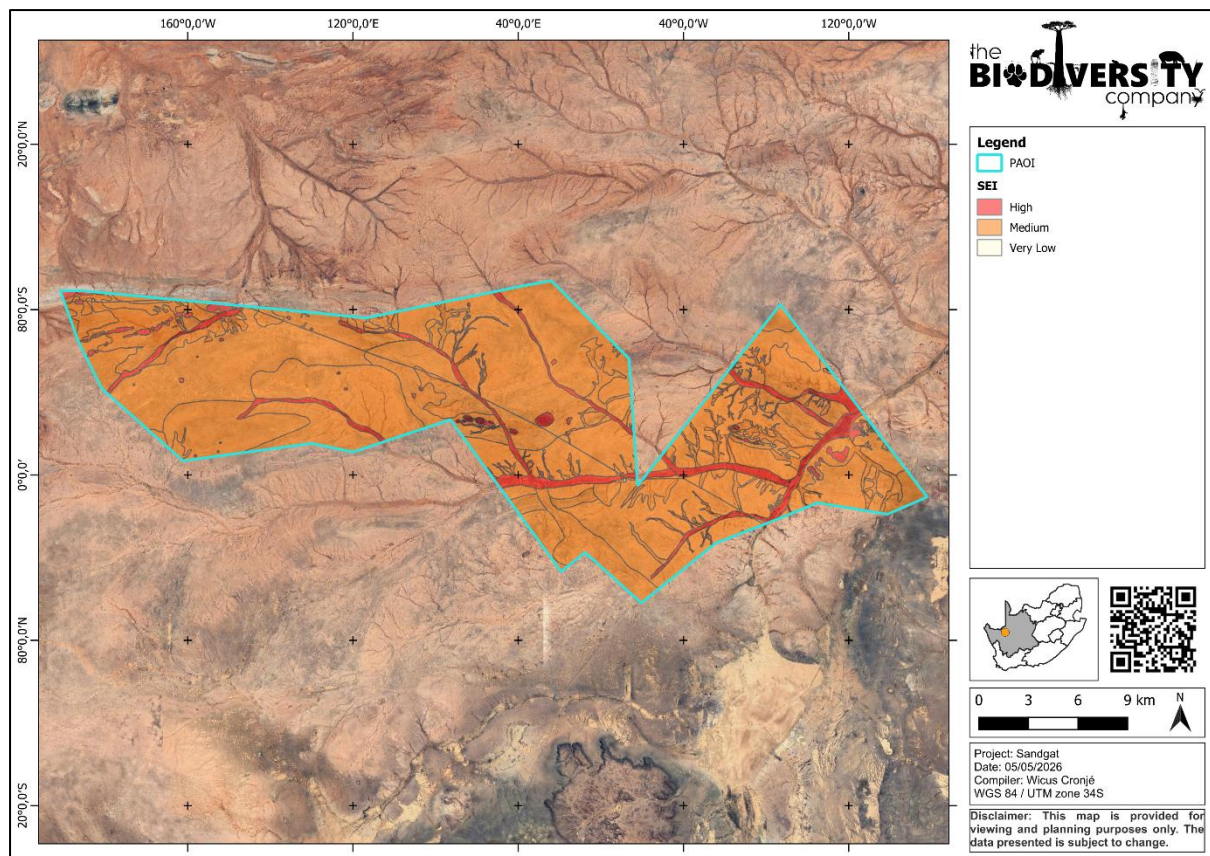


Figure 3-16 Site Ecological Importance of the PAOI for avifauna

3.4.1 Desktop Ecological Sensitivity

The following is deduced from the National Web-based Environmental Screening Tool Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended):

- Terrestrial Biodiversity Theme sensitivity is 'Very High' for the PAOI, due to the overlap with CBA 1, CBA 2, ESA and FEPA Subcatchment (Figure 3-17);

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- Plant Species Theme sensitivity is 'Medium' for the PAOI, due the possible presence of three (3) medium sensitivity species (Figure 3-18); and
- Animal Species Theme sensitivity is 'High' for the PAOI, due to the possible presence of two (2) high sensitivity avifauna species, and two (2) medium sensitivity avifauna species (Figure 3-19).

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



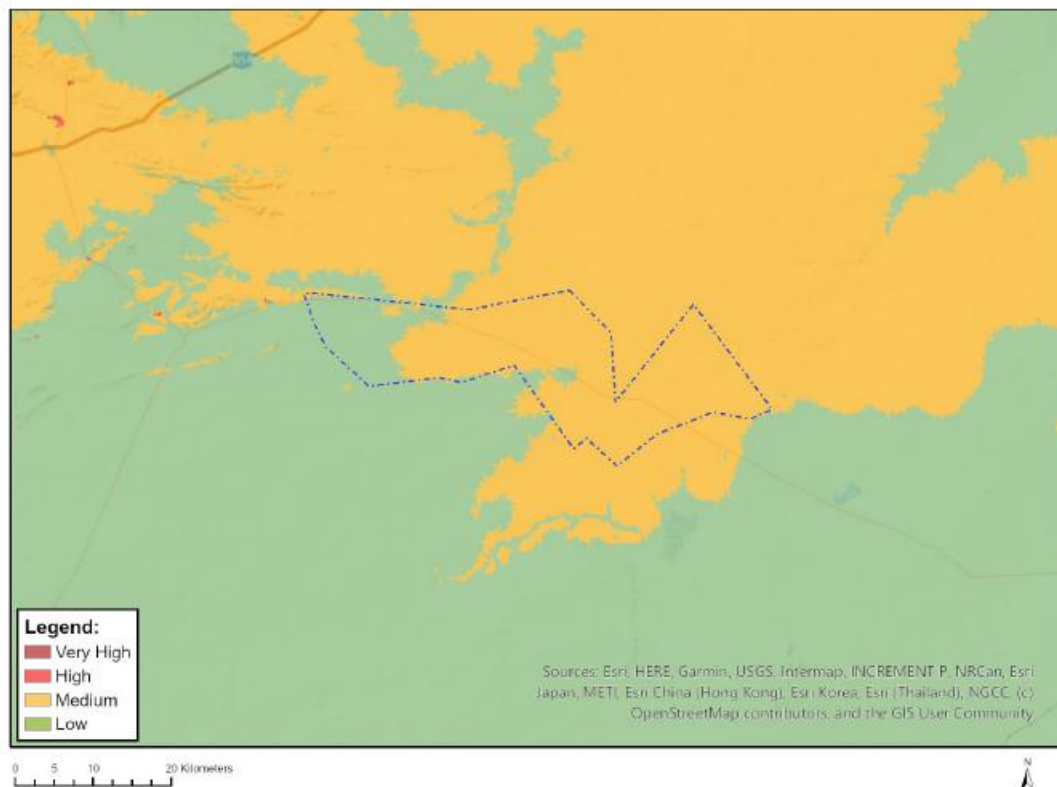
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Very High	CBA 1
Very High	CBA 2
Very High	ESA
Very High	FEPA Subcatchment

Figure 3-17 Terrestrial Biodiversity Theme sensitivity for the PAOI

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Medium	Sensitive species 1209
Medium	Sensitive species 545
Medium	Sensitive species 317

Figure 3-18 Relative Plant Species Theme Sensitivity for the PAOI

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at ejadatarerequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Falco biarmicus
High	Aves-Cursorius rufus
Low	Subject to confirmation
Medium	Aves-Neotis ludwigii
Medium	Aves-Sagittarius serpentarius

Figure 3-19 Relative Animal Species Theme Sensitivity for the PAOI

3.4.2 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed areas of the PAOI in Table 3-17. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species.

Table 3-17 Summary of the screening tool vs specialist assigned sensitivities for the proposed project.

Screening Tool Theme	Screening Tool	Habitat	Specialist		Tool Validated or Disputed by Specialist - Reasoning	
			Terrestrial	Avifauna	Terrestrial	Avifauna
Animal Theme	High	Arid Grassland	Medium	Medium	Disputed - Functional habitat which will most likely be used as movement corridors by fauna SCC and for foraging.	Disputed – Habitat is suitable for SCC but has been subject to some major impacts.
		Arid Grassland Shrubland Mosaic	Medium	Medium	Disputed - Functional habitat which will most likely be used as movement corridors by fauna SCC and for foraging.	Disputed – Habitat is suitable for SCC but has been subject to some major impacts.
		Rocky Arid Grassland Shrubland Mosaic	Medium	High	Disputed - Functional habitat which will most likely be used as movement corridors by fauna SCC and for foraging.	Validated – Habitat is suitable for specialist SCCs.
		Quartz Outcrops	High	High	Validated – Functional High sensitivity habitat capable of supporting SCC. Limited impacts observed. Suitable habitat for fauna SCC and fauna SCC is expected within these habitats	Validated – Habitat will harbour foraging SCC and serve as a corridor for movement.
		Rocky Outcrops	High	High	Validated – Functional High sensitivity habitat capable of supporting SCC. Limited impacts observed. Suitable habitat for fauna SCC and fauna SCC is expected within these habitats	Validated – Habitat will harbour foraging SCC and serve as a corridor for movement.
		Modified.	Very Low	Very Low	Disputed – Habitats are modified and degraded in nature and no longer offer suitable habitat for fauna SCC. Possibly used as movement corridor for fauna SCC.	Disputed – Habitat will have no resident SCC due to no to little foraging resources.
		Water Resources: Kaboep, Soutputs se Laagte, Steenkampsvlei se Holte, Unnamed Tributary and Depression Wetlands	High	High	Validated – Functional High sensitivity habitat capable of supporting SCC. Limited impacts observed. Suitable habitat for fauna SCC and fauna SCC is expected within these habitats	Validated – Habitat is intact and could harbour SCC not under criterion A.
		Water Resource: Drainage Area	Medium	Medium	Disputed – Functional habitat which will most likely be used as movement corridors by fauna SCC only.	Disputed – Habitat is only suitable for foraging by SCC, even if it has not experienced major impacts.
Plant Theme	Medium	Arid Grassland	Medium	N/A	Validated - Functional habitat which can support flora SCC. Scattered	

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Screening Tool Theme	Screening Tool	Habitat	Specialist		Tool Validated or Disputed by Specialist - Reasoning	
			Terrestrial	Avifauna	Terrestrial	Avifauna
					<i>Aloidendron dichotomum</i> (VU) observed.	
		Arid Grassland Shrubland Mosaic	Medium		Validated - Functional habitat which can support flora SCC. Scattered <i>Aloidendron dichotomum</i> (VU) observed.	
		Rocky Arid Grassland Shrubland Mosaic	Medium		Validated - Functional habitat which can support flora SCC.	
		Quartz Outcrops	High		Disputed - Functional High sensitivity habitat supporting SCC. <i>Aloidendron dichotomum</i> (VU), <i>Anacampseros quinaria</i> (NT) and Sensitive Species 545 (VU) observed. More SCCs are expected.	
		Rocky Outcrops	High		Disputed - Functional High sensitivity habitat capable of supporting SCC. Flora SCC are expected.	
		Modified	Very Low		Disputed - Habitats are modified and degraded in nature and no longer offer suitable habitat for flora SCC.	
		Water Resources: Kaboep, Soutpansberg, Steenkampsvlei, se Holte, Unnamed Tributary and Depression Wetlands	Medium		Validated - Functional habitat which can support flora SCC.	
		Water Resource: Drainage Area	Medium		Validated - Functional habitat which can support flora SCC.	
Terrestrial Theme	Very High	Arid Grassland	Medium	Medium	Disputed - Habitat exists in a largely natural state with some impacts observed, mostly contributed to livestock grazing. Contributes to ecosystem services and functioning. Representative of CBA 1 and 2 it overlaps.	Disputed - Habitat can be utilised for breeding, but little vegetation cover and/or short vegetation increases the chance of predation.
		Arid Grassland Shrubland Mosaic	Medium	Medium	Disputed - Habitat exists in a largely natural state with some impacts observed, mostly contributed to livestock grazing. Contributes to ecosystem services and functioning. Representative of CBA 1 and 2 it overlaps.	Disputed - Habitat can be utilised for breeding, but little vegetation cover and/ short vegetation increases the chance of predation.
		Rocky Arid Grassland Shrubland Mosaic	Medium	High	Disputed - Habitat exists in a largely natural state with some impacts observed, mostly contributed to livestock grazing. Contributes to ecosystem services and functioning. Representative of CBA 1 it overlaps.	Disputed - This habitat is ideal for the Sclater's Lark, a habitat specialist SCC, due to the presence of dark rocks. The lack of other habitat features such as trees means that not all SCC will be able to breed in this area.

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Screening Tool Theme	Screening Tool	Habitat	Specialist		Tool Validated or Disputed by Specialist - Reasoning	
			Terrestrial	Avifauna	Terrestrial	Avifauna
		Quartz Outcrops	High	High	Disputed – Habitat exists in a natural state with limited to no impacts observed. Unique niche quartz habitat within broader landscape. Contributes to ecosystem services and functioning. Representative of CBA 1 it overlaps.	Disputed – This habitat contains many microhabitats and -climates and is intact, but it's not suitable for breeding for many SCC.
		Rocky Outcrops	High	High	Disputed – Habitat exists in a natural state with limited to no impacts observed. Unique niche rocky habitat within broader landscape. Contributes to ecosystem services and functioning. Representative of CBA 1 it overlaps.	Disputed – This habitat contains many microhabitats and -climates and is intact, but it's not suitable for breeding for many SCC.
		Modified.	Very Low	Very Low	Disputed – Habitat modified in nature due to historic and current anthropogenic disturbance.	Disputed – Several major impacts mean that no suitable habitat exists for SCC.
		Water Resources: Kaboep, Soutputse Laagte, Steenkampsvlei se Holte, Unnamed Tributary and Depression Wetlands	High	High	Disputed – Habitat exists in a largely natural state and supplies a critical resource to the area – water. Unique microclimatic conditions for local fauna and flora. Contributes to ecosystem services and functioning. Representative of CBA 1 and 2 it overlaps	Disputed – This habitat is intact and therefore provides numerous ecological corridors for SCC. More resources will be available during seasonal rains, possibly attracting more SCC.
		Water Resource: Drainage Area	Medium		Disputed – Habitat exists in a largely natural state with some impacts observed. Unique microclimatic conditions for local fauna and flora. Supplies a water resource to the area. Fulfills several ecosystem services. Representative of CBA 1 and 2 it overlaps	Disputed – Habitat is only suitable for foraging by SCC, even if it has not experienced major impacts.

4 Impact Risk Assessment

4.1 Biodiversity Risk Assessment

Anthropogenic activities drive habitat destruction causing displacement of fauna and flora, and possibly direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, nesting sites and wildlife movement corridors, such as rivers, streams and drainage lines, or other locally important features. The removal of natural vegetation may reduce the habitat available for fauna species and may reduce animal populations and species compositions within the area.

Potential impacts were evaluated against the data captured during the desktop and field assessment to identify relevance to the PAOI. The relevant impacts associated with the proposed construction and operation of the development were then subjected to a prescribed impact assessment method. Impacts were assessed in terms of the construction and operational phases. The operational phase refers to that phase of the project where the construction has been completed. It should be noted that the impacts described are not exhaustive, and more impacts may be identified at a later stage. Mitigation measures were only applied to impacts deemed relevant based on the impact analysis.

Impacts were assessed for the following prospecting activities:

- Construction Phase;
- Operational Phase; and
- Decommissioning Phase.

4.2 Present Impacts to Biodiversity

Considering the anthropogenic activities and influences within the landscape, negative impacts to biodiversity were observed within the PAOI (Figure 4-1). These include:

- Grazing by livestock as well as overgrazing;
- Agricultural practices associated with livestock farming;
- Linear infrastructure (roads and fences);
- Roadkill; and
- Edge effects and AIP associated with homesteads and roads.

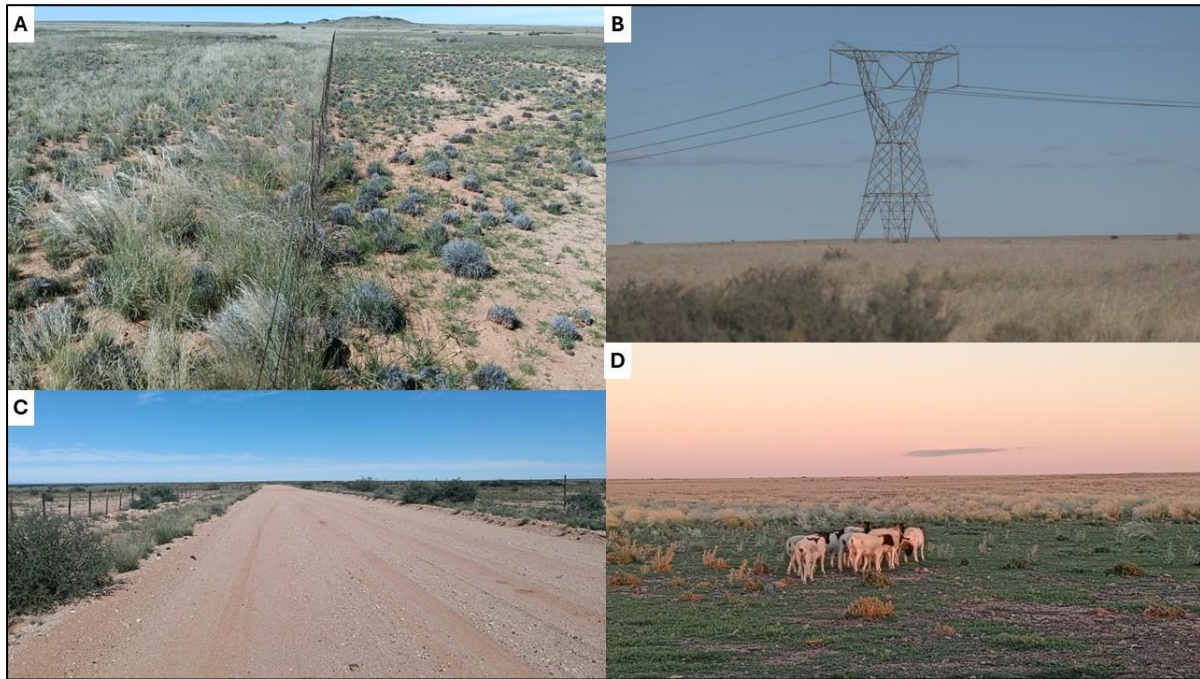


Figure 4-1 *Photographs illustrating some of the current negative impacts associated within the PAOI: A) Livestock grazing and overgrazing, B) Existing powerlines, C) Roads and D) Agriculture (livestock farming)*

4.3 Alternatives Considered

No alternatives were considered.

4.4 Irreplaceable Loss

The proposed activities will be conducted over the numerous habitats. These areas encompass indigenous vegetation that may be considered largely functional in nature and as such any irresponsible and/or medium to high impact activities will likely result in the loss of the following resources:

- CBA 1 and CBA 2;
- Water resources (River, Depression Wetlands and Drainage Areas);
- Intact LC ecosystems;
- Fauna and flora SCC;
- Protected species; and
- Indigenous vegetation.

4.5 Identification of Additional Potential Impacts

The following potential activities and potential impacts are expected for flora and fauna (including avifauna). A summary of the potential impacts during the construction and operational phases of the proposed activity are presented in Figure 4-1.

Table 4-1 *Summary of potential impacts to biodiversity associated with the proposed activity*

Main Impact	Project Activities	Secondary Impacts Anticipated
Loss of indigenous habitats	<ul style="list-style-type: none"> • Direct loss because of construction of the proposed development. • Secondary impacts associated with noise, dust and influx of AIPs into these areas. • Prevention of fires or incorrect fire regimes. • Improper solid waste disposal • Dust precipitation. • Contamination and pollution of water resources in the area. 	<ul style="list-style-type: none"> • Habitat fragmentation. • Loss of ecosystem services. • Emigration of fauna, potentially including SCC. • Increased potential for soil erosion. • Habitat fragmentation. • Increased potential for establishment of alien invasive vegetation.
Encroachment of AIP species in disturbed areas.	<ul style="list-style-type: none"> • Vegetation removal. • Soil disturbance. • Vehicles potentially spreading seed. • Unsanitary conditions surrounding infrastructure promoting the establishment of alien and/or invasive rodents. 	<ul style="list-style-type: none"> • Habitat loss for native flora & fauna (including potential SCC). • Alteration of fauna assemblages due to habitat modification. • Reduced forage quality of grazing habitat. • Spreading of potentially dangerous diseases.
Direct mortality of fauna species.	<ul style="list-style-type: none"> • Clearing of vegetation. • Roadkill due to vehicle collision. • Preparation of soil with heavy machinery • Soil excavations and soil transportation. • Intentional killing of fauna for food (hunting) or persecution (especially regarding herpetofauna). • Pollution of water resources due to spilling of hazardous chemicals from heavy machinery during construction. 	<ul style="list-style-type: none"> • Loss of ecosystem services. • Explosion of rodent populations and associated disease risk.
Emigration of fauna	<ul style="list-style-type: none"> • Disturbance from construction activities. • Loss of habitat and degradation of surrounding habitats. 	<ul style="list-style-type: none"> • Reduced population of protected species, and potentially SCC • Loss of ecosystem services.
Reduced dispersal/migration of fauna	<ul style="list-style-type: none"> • Removal of vegetation 	<ul style="list-style-type: none"> • Loss of ecosystem services • Reduced plant seed dispersal. • Disruption of migratory routes
Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, light and dust	<ul style="list-style-type: none"> • Operation of machinery (generators, crushers, vehicles). • Vehicles operating at night. • Large, intense fluorescent and mercury vapor lighting. • Drilling 	<ul style="list-style-type: none"> • Loss of ecosystem services.
Loss of SCCs and/or protected species	<ul style="list-style-type: none"> • All unregulated/unsupervised activities outdoors. • Poaching and trapping • Staff and others interacting directly with fauna (potentially dangerous), or flora. 	<ul style="list-style-type: none"> • Loss of SCC. • Harm to people (dangerous fauna).

4.6 Quantitative Impact Assessment

The standard impact assessment methodology may be used in the capture of generic anticipated impacts and potential mitigation measures for Basic Assessment Reports and Environmental Impact Assessment (EIA) Reports. The methodology described herein complies with the requirements of the EIA Regulations (2014), promulgated in terms of the National Environmental Management Act, 1998

(Act No. 107 of 1998). The impacts assessed here as assessed based on the loss of the full area of the site as well as all habitats present.

The purpose of the impact assessment is to:

- Assess impacts of proposed activities on biodiversity of the proposed development area;
- Assess whether proposed activities are likely to have significant impacts on biodiversity and specifically species of conservation concern; and
- Identify practical, implementable mitigation measures to reduce the significance of proposed activities on biodiversity.

It is important to note that the ratings applied within the risk assessment model, considered impacts to open space or natural habitats within the development area and not for areas already transformed. It was assumed that existing access roads will be utilised. Should new access roads be proposed, they must be assessed separately. These impacts should be considered in conjunction with the Aquatic Impact Assessment as provided (TBC, 2026).

The Environmental Impact Assessment rating procedure as provided by the client, EIMS, was used for the impact assessment (Appendix D: Impact Assessment).

4.6.1 Construction and Operational Phase

The following potential impacts on the biodiversity were considered for the construction/operational phase of the project. Due to the nature of the project, only one phase of impacts is expected, and refers to the period during which the seismic studies are conducted. The construction and operational phase refer to the period during which invasive prospecting activities will be performed. This phase includes the period when temporary offices, toilets etc that is assumed to be needed for the prospecting. This phase usually has the largest direct impact on biodiversity.

The following potential main impacts on the fauna and flora were considered for the construction and operational phases of the proposed development (Table 4-2).

- Degradation, destruction and fragmentation of the vegetation community including sensitive habitats, and the loss of SCC and protected species;
- Introduction and spread of alien species, especially plants;
- Displacement and fragmentation of the faunal community (including threatened species) due to ongoing anthropogenic disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, road mortalities and/or poaching);
- Displacement and fragmentation of the avifaunal community (including threatened species) due to ongoing anthropogenic disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, road mortalities and/or poaching);
- Soil erosion (especially due to stormwater runoff); and
- Potential leaks, discharges (including prospecting sludge), and pollution from machinery and storage leaching into the surrounding environment.

The mitigation measures required to lower the significance of these impacts are provided in section 4.8 of this report.

4.6.2 Decommissioning Phase

This phase refers to the removal of equipment and impacts upon completion of the operational phase, i.e. after the completion of the invasive prospecting/drilling. The impact is similar to the construction phase, although no additional intentional vegetation clearance or construction is expected (Table 4-2).

The following potential impacts were considered:

- Continued fragmentation and degradation of ecosystems;
- Spread of alien invasive species and reduction of habitat integrity; and
- Ongoing displacement and direct mortalities of faunal community (including SCC) due to disturbance (direct habitat loss, road collisions, noise, light, dust and vibration).

The mitigation measures required to lower the significance of these impacts are provided in section 4.8 of this report.

Table 4-2 *Impacts to biodiversity associated with the proposed activity in the operational phase and decommissioning phases*

Identifier	Impact	Alternative	Phase	Event	Pre-Nature	Pre-Extent	Pre-Duration	Pre-Magnitude	Pre-Reversibility	Consequence	Pre-Probability	Pre-Mitigation Significance Score	Pre-Mitigation Significance	Post-Nature	Post-Extent	Post-Duration	Post-Magnitude	Post-Reversibility	Consequence2	Post-Probability	Post-mitigation Significance Score	Post-Mitigation Significance	Confidence	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score	Final Significance
1	Continued degradation, loss and fragmentation of the vegetative community, and SCC or protected species	1	Construction and Operation	Normal operations or events	-1	3	4	4	3	-3.5	4	-14	High -	-1	1	2	2	2	-1.75	3	-5.25	Medium to low -	High	3	3	1.50	-7.88	Medium to low -
2	Continued spread of alien invasive plant species and erosion due to disturbed soils	1	Construction and Operation	Normal operations or events	-1	2	4	3	3	-3	4	-12	Medium to high -	-1	1	2	2	2	-1.75	3	-5.25	Medium to low -	Medium	2	2	1.25	-6.56	Medium to low -
3	Continued displacement and fragmentation of the faunal	1	Construction and Operation	Normal operations or events	-1	3	3	4	3	-3.25	5	-16.25	High -	-1	2	2	2	2	-2	3	-6	Medium to low -	High	3	3	1.50	-9.00	Medium to high -

[illegible]

4.7 Cumulative Impacts

Cumulative impacts are assessed in context of the extent of the proposed PAOI; other developments in the area; and general habitat loss and transformation resulting from other activities in the area. Due to the presence of intact ecosystems, including sensitive ecosystems (i.e. Rocky Arid Shrubland Grassland Mosaic, Quartz Outcrops, Rocky Outcrops and Water Resources), CBA 1 and CBA 2 areas, the area is sensitive. Impacts from prospecting are, in general, high, but localised.

The impacts of projects are often assessed by comparing the post-project situation to a pre-existing baseline. Where projects can be considered in isolation this provides a good method of assessing a project's impact. However, in areas where baselines have already been affected, or where future development will continue to add to the impacts in an area or region, it is appropriate to consider the cumulative effects of development. This is similar to the concept of shifting baselines, which describes how the environmental baseline at a point in time may represent a significant change from the original state of the system. This section describes the potential impacts of the project that are cumulative for fauna and flora. Localised cumulative impacts include the cumulative effects from operations that are close enough to potentially cause additive effects on the environment or sensitive receivers, dust deposition, noise and vibration, disruption of corridors or habitat, groundwater drawdown, groundwater and surface water quality, and transport.

A total area of 30 km surrounding the PAOI was used to assess the total habitat loss in the area and subsequently the cumulative impact. To determine the intact remnant habitat the RLE (2022) remnant spatial data was utilised. The total habitat lost in the area, excluding the proposed project, is 0.16 %. If the proposed project is concluded (and it is assumed that the entire PAOI will be impacted), the percentage of habitat lost increases to 6.92 % (Table 4-3).

Table 4-3 The cumulative impacts considered for the project

Aspect	Total Area of 30 km ²	Intact Remnant Habitat	Total Habitat Lost	Percentage area lost
Excluding this project	694764 ha	693655 ha	1109 ha	0.16 %
Including this project*	694764 ha	693655 ha	46980 ha + 1109 ha = 48089 ha*	6.92 %

* Assume development of the entire PAOI.

The post-mitigation impact ranges from Low negative to Medium to High negative, in isolation (Table 4-2).

Only about 0.16% of natural habitat has been lost to date. Table 4-3 indicates that the proposed development is expected to cause an additional 6.76% loss, bringing the total cumulative loss to 6.92% if the current project proceeds. This estimate assumes that the entire PAOI will be affected or developed and is based on worst-case scenario. This is not expected during the prospecting phase of this project and the contribution is therefore likely to decline once the precise project footprint has been confirmed. The cumulative impact of the proposed development is therefore assessed as moderate. The area has remained relatively undisturbed, meaning that most of the cumulative impact is associated with the proposed project itself. It is therefore essential that the broader region be subject to careful spatial planning and management, and that existing major infrastructure developments be monitored closely over the long term.

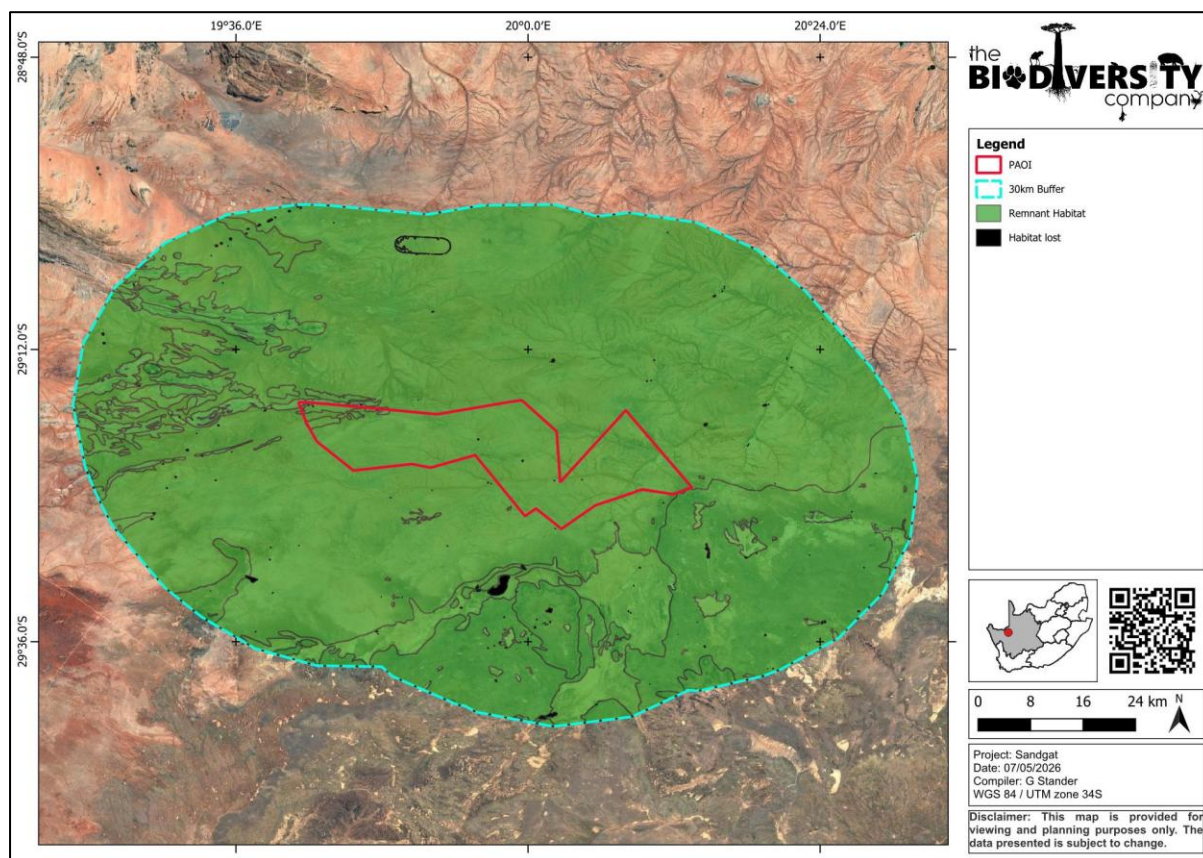


Figure 4-2 Cumulative habitat loss in 30 km surrounding the PAOI

4.8 Biodiversity Management Objectives

The purpose of the management objectives is to inform on the mitigations required to lower the risk of the impacts associated with the proposed activity, provide measures for improving the conservation value of the property and to be able to be inserted into the Environmental Management Programme (EMPr).

4.9 Unplanned Events

The planned activities will have anticipated impacts as discussed; however, unplanned events may occur on any project and may have potential impacts which will need management.

Table 4-4 is a summary of the findings of an unplanned event assessment from a terrestrial ecology perspective. Note, not all potential unplanned events may be captured herein, and this must, therefore, be managed throughout all phases according to recorded events.

Table 4-4 Summary of unplanned events for terrestrial biodiversity

Unplanned Event	Potential Impact	Mitigation
Spills into the surrounding environment	Contamination of habitat as well as water resources associated with a spillage.	A spill response kit must always be available. The incident must be reported on and if necessary, a biodiversity specialist must investigate the extent of the impact and provide rehabilitation recommendations.
Fire	Uncontrolled/unmanaged fire that spreads to the surrounding natural vegetation.	An appropriate/adequate fire management plan needs to be implemented.

4.9.1 Construction and Operational Phase

The mitigation actions required to reduce the significance of the impacts associated with the development during the Construction Phase are provided below. Table 4-5 provides the management objectives pertaining to habitats and vegetation, Table 4-6 provides the management objectives pertaining to alien and invasive vegetation and Table 4-7 provides the management objectives pertaining to fauna (including avifauna).

Table 4-5 *Summary of management objectives pertaining to impacts to habitats and vegetation associated with the proposed development during the construction and operational phases*

Anticipated Impact	Degradation, destruction and fragmentation of the vegetation community including sensitive habitats, and the loss of flora SCC and protected species
Mitigation Objective	Avoidance / minimisation of the disturbance and degradation of vegetation and ecosystems
Mitigation	Action/control
<ul style="list-style-type: none"> • A site walkdown and micro-siting must be performed, to locate and mark any flora SCC and protected species which may occur on site. • Vegetation clearing commences only after the necessary permits for SCCs or protected plants have been obtained. Any individual of the protected plants that were observed needs a relocation or destruction permit for any individual to be removed or destroyed due to the development. High visibility flags must be placed near any protected plants to avoid any damage or destruction of the species. If left undisturbed the sensitivity and importance of these species needs to be part of the environmental awareness program. • Quartz Outcrops and Rocky Outcrops (High SEI) habitats, together with a 15 m buffer area, must be declared no-go areas. Existing roads transversing these areas may be used. No new roads to be developed within these areas. • High SEI areas must be avoided (avoidance and minimisation mitigation). • Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be avoided where possible, otherwise minimized. All activities must be restricted within the very low-medium sensitivity areas. No further loss of high sensitivity areas and associated buffers should be permitted. • It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon. Minimise vegetation clearing to the minimum required. Areas should be cleared and disturbed on a needs basis only, as opposed to clearing and disturbing a number of sites simultaneously. • Access to the PAOI must be strictly controlled. No flora theft may be tolerated. Routine monitoring and checks of personnel must be performed for the duration of the project. • All construction/operational and access must make use of the existing roads as much as possible, the creation of new roads should be avoided as much as possible. • Make use of existing roads for crossing river, tributaries and drainage areas. Crossing of these features should only be considered in when dry. • No vehicle crossing allowed through depression wetlands. • All laydown, chemical toilets etc. should be restricted to Very Low SEI areas. Laydown areas are only allowed within Medium SEI areas if all Very Low SEI areas have been considered and exhausted. No laydown areas are allowed within High SEI areas. • Any materials may not be stored for extended periods of time and must be removed from the PAOI once the construction/closure phase has been concluded. No permanent structures should be permitted sites. No storage of vehicles or equipment will be allowed outside of the designated project areas. • A Rehabilitation Plan must be written for areas cleared of vegetation or disturbed during construction and operation and ensured that it is adhered to. An acceptable plan must be in place prior to the commencement of construction activities. The rehabilitated areas must be revegetated with indigenous vegetation. This will prevent erosion and reduce the likelihood of encroachment by alien invasive plant species. Bringing plant species into/out of the PAOI should only be allowed for rehabilitation purposes. • Rehabilitation of the disturbed areas existing in the PAOI must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type • Progressive rehabilitation will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank. Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion. 	

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- Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities.
- A fire action plan needs to be compiled and implemented to restrict the impact unplanned fires might have on the surrounding areas.
- It should be made an offence for any staff to /take bring any plant species into/out of any portion of the PAOI. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.
- The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into High SEI areas and the surrounding environments. Signs must be put up to enforce this..

Table 4-6 *Summary of management objectives pertaining to impacts caused by alien and invasive vegetation associated with the proposed development during the construction and operational phases*

Anticipated Impact	Introduction and spread of alien species, especially plants
Activity/risk source	Land clearing, fire and dust.
Mitigation Objective	Avoidance / minimisation of the disturbance and degradation of vegetation and ecosystems
Mitigation	Action/control
<ul style="list-style-type: none"> • An Alien Invasive Plant (AIP) Management Plan for the prospecting sites and access routes must be compiled and implemented during any on-site activities. The plan must identify areas for action (if any) and prescribe the necessary removal methods and frequencies to be applied. This plan must also include a monitoring plan and be updated as/when new data is collated. <ul style="list-style-type: none"> ○ Conduct regular checks for alien invasive plant (AIP) encroachment during the operational phase to prevent alien invasion issues due to disturbances. Monitoring should occur every three months for the first two years and every six months thereafter for the project's duration. ○ Remove or control all AIP species using the appropriate methods outlined in the AIP management plan. • Implement a stormwater management plan for all developable areas. • Implementation of a waste management plan. • Temporary storage of domestic waste shall be in covered waste skips. • Removal of domestic waste on a regular basis, no overspill is permitted • Create and implement a Solid Waste Management Plan. Prioritise waste management by ensuring all waste is collected, stored, and disposed of properly. It is recommended to remove waste from the site at least weekly. • The unauthorised introduction, removal, or translocation of plant material into or out of any portion of the PAOI shall be prohibited. This prohibition does not apply to the approved removal and disposal of alien invasive or exotic plant species as part of alien plant control measures, nor to the introduction of approved indigenous plant material for rehabilitation purposes. The purpose of this measure is to prevent the spread of alien invasive species and to avoid the unlawful collection or movement of indigenous flora. 	

Table 4-7 *Summary of management objectives pertaining to impacts to fauna associated with the proposed development during the construction and operational phases*

Anticipated Impact	Displacement and fragmentation of the faunal community (including threatened species) due to ongoing anthropogenic disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, road mortalities and/or poaching)
Activity/risk source	Land clearing, Fire and human presence as well as roads.
Mitigation Objective	Avoidance / minimisation of the disturbance and mortality of fauna
Mitigation	Action/control
<ul style="list-style-type: none"> • Clearly mark construction zones to prevent impact on surrounding areas, using physical barriers like safety tape and signs instead of painted lines. • Prior to vegetation clearing activities, the area to be cleared should be walked on foot by 1-2 individuals to create a disturbance in order for fauna to move off. Disturbance must occur as soon before vegetation clearing as possible and no unnecessary disturbance to the area is permitted <ul style="list-style-type: none"> ○ Any tortoises present should be removed from the affected areas before the start of site clearing/ construction and relocated to safe areas within the PAOI. 	

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- Should this project continue to mining – special consideration should be given to the habitat requirements for the NT Northern Tent Tortoise (*Psammobates tentorius verroxii*).
- Any fauna threatened by the construction activities should be removed safely by an appropriately qualified environmental officer or removal specialist.
- Should nests be found an avifauna specialist must be consulted on the appropriate actions to take.
- Safely relocate any wildlife at risk from construction and operational activities with the help of a qualified environmental officer or specialist.
- Limit construction vehicle speeds to 40 km/h to prevent accidents and install appropriate speed control measures and signage.
 - Driving on access roads at night should be restricted to maximum 20 km/h to reduce or prevent wildlife road mortalities which occur more frequently during this period.
- Wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed, the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area.
 - An approximately 15 m x 15 m temporary barrier shall be installed around the active work area for the duration of the relevant activities. The barrier must be restricted to the minimum footprint required and may not be expanded beyond what is necessary for safe and effective operations.
- Minimise the time between clearing an area and starting development to prevent wildlife from returning to disturbed sites.
- Conduct excavations progressively and cover any open holes overnight to prevent wildlife from falling in. Inspect these areas before backfilling.
- Focus work on one area at a time, as far as possible, to reduce the extent of on-site activities, allowing wildlife to relocate as the project progresses. This helps smaller animals find refuge in nearby undisturbed areas.
- Implement noise and light mitigation measures for any nighttime construction activities to minimise disturbances to nocturnal species expected in the area.
- Require all personnel and contractors to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof.
 - All personnel should undergo environmental induction with regards to avifauna and in particular awareness about not harming, collecting, or hunting terrestrial species, and owls, which are often persecuted out of superstition. Signs must be put up to enforce this.
- All infrastructure must be removed after decommissioning, and the site must be rehabilitated.
- Where possible, instead of clearing the entire area at once, work on specific sections as needed. This approach involves focusing on one area at a time and following a systematic process. By doing so, the amount and scope of on-site activities are minimised, which allows wildlife to gradually relocate as the project advances. This method provides smaller birds, mammals, and reptiles the opportunity to cope with the disturbance by staying in nearby undisturbed areas that are close to their natural habitats.
- Design and limit outdoor lighting to reduce its impact on wildlife. Use fixtures with baffles, hoods, or louvers, directing light downward and away from sensitive areas like outcrops, rivers and wetlands. Avoid fluorescent and mercury vapor lights, opting for sodium vapor (yellow) lights whenever possible.
- Utilise motion detection lighting where feasible to minimise unnecessary illumination.
- Limit the use of vehicles at night to what is absolutely necessary, with speed limits of 20 km/h applied.
- Keep noise levels low from dusk to dawn to avoid disturbing nocturnal animals as well as birds.
- Noise-generating activities associated with construction activities should be kept to a minimum. Implement noise and light mitigation measures for any nighttime construction activities to minimise disturbances to nocturnal species expected in the area.

Anticipated Impact	Soil erosion (especially due to stormwater runoff)
Activity/risk source	Land clearing, Fire and human presence as well as roads.
Mitigation Objective	Avoidance / minimisation of the disturbance and mortality of fauna
Mitigation	Action/control
<ul style="list-style-type: none"> • All cleared or disturbed areas must be stabilized within 14 days of exposure using mulch, geotextiles, or indigenous grass seeding to prevent soil loss. • Install temporary berms, silt fences, or sandbags downslope of disturbed areas to intercept and slow stormwater runoff. • Limit the extent of vegetation clearing to only those areas necessary for prospecting activities. • Construct stormwater diversion channels upslope of work areas to direct clean water away from disturbed soils. • Inspect and maintain all erosion control structures weekly and after rainfall events, repairing any damage immediately. • Stockpile topsoil separately and cover with tarpaulin or vegetation to prevent wind and water erosion. • Rehabilitate all disturbed areas with indigenous vegetation immediately after prospecting activities are completed. 	

Anticipated Impact	Potential leaks, discharges, pollutant from machinery and storage leaching into the surrounding environment
Activity/risk source	Land clearing, Fire and human presence as well as roads.
Mitigation Objective	Avoidance / minimisation of the disturbance and mortality of fauna
Mitigation	Action/control
<ul style="list-style-type: none"> All machinery must be inspected daily for oil, fuel, and hydraulic leaks; any leaks must be repaired before equipment is used on site. Designate a bunded, impermeable area for refuelling, maintenance, and storage of hazardous materials, located at least 50 m from any watercourse or drainage line. Provide spill kits at all work and storage areas, and ensure all staff are trained in their use. All prospecting sludge and wastewater must be contained in lined sumps or tanks; no discharge to the environment is permitted. Store all chemicals, fuels, and lubricants in clearly marked, sealed containers within a bunded area with 110% capacity of the largest container. Remove all waste oils, used filters, and contaminated materials from site for disposal at a licensed hazardous waste facility. Conduct weekly inspections of storage and machinery areas for signs of leaks or spills and document findings and corrective actions. 	

4.9.2 Decommissioning Phase

The mitigation actions required to reduce the significance of the impacts associated with the development during the Decommissioning Phase are provided below. Table 4-8 provides the management objectives pertaining to rehabilitation of habitats.

Table 4-8 *Summary of management objectives pertaining to rehabilitation of habitats associated with the proposed development during the decommissioning phase*

Anticipated Impact	Destruction of vegetation, encroachment and displacement of the natural vegetation community and direct mortality of fauna
Activity/risk source	Alien Invasive Species, dust, erosion and edge effects. Earthworks, vehicle collisions and persecution
Mitigation Objective	Rehabilitate and return the area to more natural condition
Mitigation	Action/control
<ul style="list-style-type: none"> Develop post-prospecting environments in conjunction with regional development plans as well as the recreation of habitats where possible or structure altered landscapes to be compatible with regional habitats. Any fauna threatened by the activities should be removed safely by an appropriately qualified environmental officer or removal specialist. All hazardous materials, if any, should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner. Areas other than the footprint areas and existing surface infrastructure areas, should be declared as 'no-go' areas to vehicles (only). All essential staff – machinery must be limited to decommissioning areas (no need to go outside the authorised area). The rehabilitated areas must be revegetated with indigenous vegetation. Reduce the dust generated by vehicles and earth moving machinery, through wetting the soil surface (with "dirty water") and putting up signs to enforce speed limits to enforce reduced speeds. Implementation of a closure / rehabilitation plan from the onset of the operation of infrastructure. Rehabilitation must be conducted concurrently. Monitoring of rehabilitation implementation on an annual basis for 5 years post-closure. The plan and interventions must be amended accordingly. Any gullies or dongas must also be backfilled The area must be shaped to a natural topography. Trees (or vegetation stands) removed must be replaced with species indigenous to the area. No grazing must be permitted within the rehabilitating area to allow for vegetation recovery. Alternatively, the area must remain fenced or otherwise barriered off for the duration of the rehabilitation period to prevent disturbance and allow recovery to take place. Continued implementation of an alien vegetation management plan. 	

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- Rehabilitation in accordance with the Rehabilitation Plan for the development must be undertaken in areas disturbed during the decommissioning phase.
- Monitoring of the rehabilitated area must be undertaken at quarterly intervals for 3 years after the decommissioning phase
- All erosion problems observed to be created during any onsite activities by the holder, should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.

4.9.3 Generic Management Actions

The generic mitigation actions required to reduce the significance of the impacts associated with the development can be seen presented in Table 4-9.

Table 4-9 *Summary of the generic management objectives associated with the proposed development*

Mitigation: Action/control
<ul style="list-style-type: none"> • Demarcate work areas during the construction phase to avoid affecting outside areas. Use physical barriers e.g., safety tape, not painted lines, and use signage. • All activities must make use of existing roads and tracks as far as practically and feasibly possible. Existing roads must be used as far as possible. Any new roads must be authorised. • Do not clear areas of indigenous vegetation outside of the direct project footprint. • Minimise vegetation clearing to the minimum required. • Compile and implement a rehabilitation plan from the onset of the project. • Rehabilitate areas as soon as they are no longer impacted by construction. <ul style="list-style-type: none"> ○ The rehabilitated areas must be revegetated with indigenous vegetation. • Progressive rehabilitation will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank. Surplus rehabilitation material can be applied to other others in need of stabilisation and vegetation cover. • Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities. • A fire management plan must be compiled and implemented to minimise the risk of veld fires around the project site, unless suitable internal fire management and prevention procedures already exist, in which case these may be utilised and implemented, provided that they are adequate for the nature and scale of the proposed activities. • Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and bare (unvegetated) areas. <ul style="list-style-type: none"> ○ Reduce the dust generated by operational vehicles and earth moving machinery, through wetting the soil surface and putting up signs to enforce speed limits to enforce reduced speeds. ○ No non-environmentally friendly suppressants may be used as this could result in pollution of water sources • Implementation of a waste management plan, this plan must also prescribe a monitoring plan and be updated as/when new data is collated. Waste management must be a priority and all waste must be collected, stored and disposed of adequately. It is recommended that all waste be removed from site on a weekly basis (as a minimum) to prevent rodents and pests entering the site. <ul style="list-style-type: none"> ○ Refuse bins will be emptied and secured. ○ Temporary storage of domestic waste shall be in covered waste skips. ○ Maximum domestic waste storage period will be 7 days. • A pest control plan must be put in place and implemented; it is imperative that poisons not be used. • Prohibit staff from bringing any plant species into or out of the PAOI. This includes both indigenous and exotic plants to prevent the spread of invasive species and illegal plant collection. Bringing plant species into/out of the PAOI should only be allowed for rehabilitation purposes. • Develop and strictly adhere to a Rehabilitation Plan for the development area. • Cement must be mixed in a designated area on a liner away from water sources and buffers and that successful rehabilitation of the construction areas can take place. • Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair. • A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. <ul style="list-style-type: none"> ○ Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. ○ No servicing of equipment on site unless necessary. ○ All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers.

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- Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment.
 - Construction activities and vehicles could cause spillages of lubricants, fuels and waste material negatively affecting the functioning of the ecosystem.
 - All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the PAOI.
-

5 Conclusion

The PAOI consists of largely natural and intact habitats overlapping Least Concern ecosystems. The PAOI is mainly used for livestock grazing and impacts observed are largely associated with agricultural practices.

Six (6) major terrestrial habitats, and a set of Water Resources, were identified within the PAOI. These include Arid Grassland (Medium SEI), Arid Grassland Shrubland Mosaic (Medium SEI), Rocky Arid Grassland Shrubland Mosaic (Medium SEI from a terrestrial perspective and High SEI from an avifaunal perspective), Quartz Outcrops (High SEI), Rocky Outcrops (High SEI) and Modified (Very Low). The SEI of the Water Resources identified ranged between Medium (Drainage Areas) and High (Kaboep, Soutputs se Laagte, Steenkampsvlei se Holte, Unnamed Tributary and Depression Wetlands).

Three (3) flora SCC were observed (Sensitive Species 545, *Anacampseros quinaria* and *Aloidendron dichotomum*). One (1) reptile SCC was observed (*Psammobates tentorius verroxii*) and multiple avifauna SCC was recorded during the site survey. Furthermore, multiple provincially protected species were also recorded during the site assessment. As a result of the large size of the PAOI and access limitations, a walkdown assessment is required, during the correct flowering season (i.e. wet season). The walkdown must be performed for the project footprint, assessing proposed borehole locations, to allow for micro-siting, and for the identification and location of any SCC or protected flora species. A nest walkdown is also recommended to survey powerlines and watercourses for roosting spots of vultures and nesting spots for harriers, respectively (as recommended by the field observer).

The Screening Tool designated the area as having a Very High Terrestrial Biodiversity sensitivity. This was disputed and varied for the respective habitats as indicated in section 3.4.2. The Quartz Outcrop, Rocky Outcrop and some Water Resources were designated a High Terrestrial Biodiversity sensitivity. From an avifaunal perspective, the Rocky Arid Grassland Shrubland Mosaic is also considered as having a High Terrestrial Biodiversity sensitivity. The Screening Tool designated the area as having a Medium Plant Theme sensitivity. This was validated and disputed and varied for the respective habitats as indicated in section 3.4.2. The Quartz Outcrop and Rocky Outcrop were designated a High Plant Theme sensitivity. The Screening Tool designated the area as having a High Plant Theme sensitivity. The Quartz Outcrop, Rocky Outcrop and some Water Resources were designated a High Animal Theme sensitivity from a terrestrial perspective. From an avifaunal perspective, the Rocky Arid Grassland Shrubland Mosaic is also considered as having a High Animal Theme sensitivity. The remaining habitats were disputed as indicated in section 3.4.2.

The outcome of the SEI assessment suggests that the following sensitivities should be applied, as outlined in Table 5-1.

Table 5-1 **Table presenting the habitats within the PAOI and their respective sensitivities**

Habitat	Condition	SEI		Northern Biodiversity Plan (NCBSP) (2024)	Cape Spatial Developability
		Terrestrial Biodiversity	Avifauna		
Arid Grassland	Natural	Medium	Medium	CBA 1 and CBA 2	Prospecting with boreholes and a jeep track acceptable, with concurrent rehabilitation.
Arid Grassland Shrubland Mosaic	Natural	Medium	Medium	CBA 1 and CBA 2	Prospecting with boreholes and a jeep track acceptable, with concurrent rehabilitation.
Rocky Arid Grassland Shrubland Mosaic	Natural	Medium	High	CBA 1	Prospecting with boreholes and a jeep track acceptable, with concurrent rehabilitation. Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure

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Habitat	Condition	SEI		Northern Biodiversity Plan (NCBSP) (2024)	Cape Spatial	Developability
		Terrestrial Biodiversity	Avifauna			
						design to limit the amount of habitat impacted, limited development activities of low impact acceptable.
Quartz Outcrops	Natural	High	High	CBA 1		No-go area, along with a 15 m buffer.
Rocky Outcrops	Natural	High	High	CBA 1		No-go area, along with a 15 m buffer.
Modified	Modified	Very Low	Very Low			Medium to high impact activities permitted, with concurrent rehabilitation.
Rivers: Kaboep, Soutpans se Laagte, Steenkampsvlei se Holte, Unnamed Tributary and Depression Wetlands	Natural	High	High	CBA 1 and CBA 2		See Aquatic assessment (TBC, 2026).
Drainage Areas	Natural	Medium	Medium	CBA 1 and CBA 2		See Aquatic assessment (TBC, 2026).

The ecological integrity, importance and functioning of these habitats play a crucial role and an important habitat for various fauna and flora. The preservation of these systems is the most important aspect to consider for the proposed project.

Development within areas of high sensitivity is not supported by the specialist. The Quartz and Rocky Outcrop areas, together with the recommended 15 m buffer, should be designated as no-go zones (Figure 5-1). In addition, any proposed development within CBA 1 and CBA 2 should be discussed with the relevant regulatory authorities. In the case of prospecting, the anticipated impacts are expected to be short term, with good rehabilitation potential. With the appropriate mitigation measures in place, it is expected that the CBA areas could be restored to a condition close to their pre-construction state.

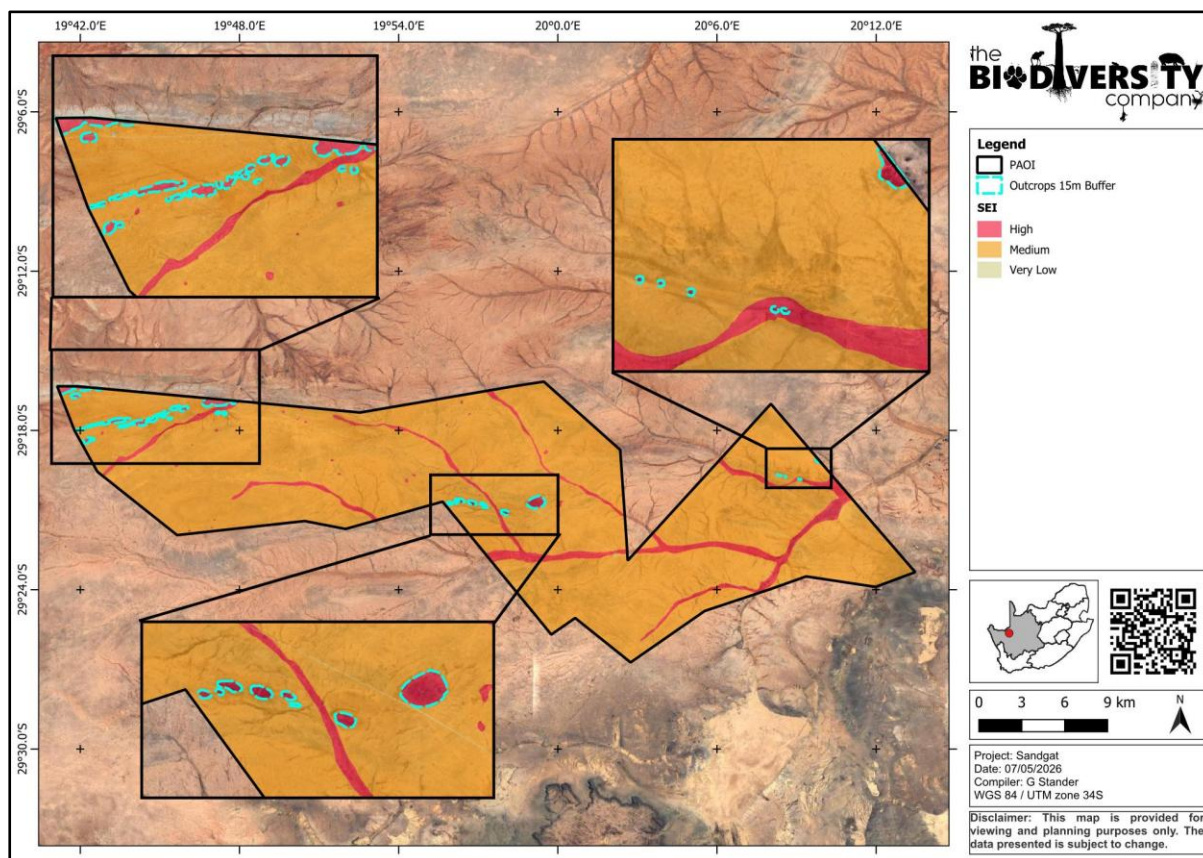


Figure 5-1 Map illustrating the Terrestrial Site Ecological Importance of the PAOI including the outcrop no – go buffers

5.1 Impact Statement

No fatal flaws were identified in relation to the project. With the proposed mitigation measures in place, the overall residual impact is anticipated to range from low to medium-high. Based on the information presented above, the specialists are of the opinion that the proposed project is acceptable only on condition that all mitigation measures contained in this report, as well as those outlined in the relevant specialist studies, are fully implemented and that the recommendations set out below are met.

The Competent Authority should take into account all mitigation measures included in this report, together with those contained in any supporting specialist reports, when considering the application.

5.2 Specialist Opinion

There are areas within the PAOI that possess a High SEI. This denotes that avoidance mitigation wherever possible must be implemented. This includes changes to project infrastructure design and activity to limit the amount of habitat impacted. Project planning according to mitigation may provide favourable avoidance mitigation.

The following conditions may be considered by the Competent Authority for the authorisation:

- 1) No development (no-go) within High SEI habitats, along with the prescribed 15 m buffer for the Quartz and Rocky Outcrop habitat types;
- 2) This assessment does not consider proposed access roads, the locations of which were not provided prior to the field survey. Therefore, a separate survey must be conducted for the authorisation of any new access road developments for the project;

- 3) A site walkdown must be undertaken during the appropriate flowering season and after sufficient rainfall to stimulate flowering. This assessment must be conducted once the proposed development footprint and borehole locations have been finalised in a detailed layout. The walkdown has two primary objectives: firstly, to inform the final layout through micro-siting; and secondly, to identify and map any SCC or protected plant species within the development footprint. This walkdown must be completed prior to the commencement of any development activities. All floral SCC and protected species must, as far as possible, be avoided; where avoidance is not feasible, the necessary permits must be obtained to undertake a plant search-and-rescue operation. In addition, a nest walkdown must be carried out before construction begins, specifically to identify any active nests within the affected area.
- 4) The Water Resource habitats must be avoided and mitigations and buffers implemented as stipulated in the Freshwater Assessment (TBC, 2026);
- 5) An AIP management plan must be compiled and implemented from the onset of the project; and
- 6) A rehabilitation plan must be compiled and implemented from the onset of the project.

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7 Appendix Items

7.1 Appendix A: Methods

7.1.1 Desktop Dataset Assessment

7.1.1.1 Ecologically Important Landscape Features

Existing ecologically relevant data layers were incorporated into a GIS to establish how the proposed development might interact with any ecologically important entities. Emphasis was placed around the following spatial datasets:

- National Biodiversity Assessment 2018 (Skowno *et al*, 2019) - The purpose of the National Biodiversity Assessment (NBA) is to assess the state of South Africa's biodiversity based on best available science, with a view to understanding trends over time and informing policy and decision-making across a range of sectors. The NBA deals with all three components of biodiversity: genes, species and ecosystems; and assesses biodiversity and ecosystems across terrestrial, freshwater, estuarine and marine environments. The two headline indicators assessed in the NBA are:
 - Red List of Ecosystems (RLE) 2021 – The list was first published in 2011 and has since been substantially revised by authors Dr Andrew Skowno and Mrs Maphale Monyeki (SANBI, 2022). This list is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa by Mucina and Rutherford (2006). A total of 120 of the 456 terrestrial ecosystem types assessed are categorised as threatened and together make up approximately 10% of the remaining natural habitat in the country. Of these 120 ecosystem types, 55 are Critically Endangered (CR), 51 Endangered (EN) and 14 are Vulnerable (VU). The remainder are categorised as Least Concern (LC) (SANBI, 2022; Skowno & Monyeki, 2021).
- Ecosystem Protection Level – indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. Not Protected, Poorly Protected or Moderately Protected ecosystem types are collectively referred to as under-protected ecosystems.
- Protected areas:
 - South Africa Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD) (DFFE, 2023a) – The South African Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD) contains spatial data for the conservation of South Africa. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. The database is updated on a continuous basis and forms the basis for the Register of Protected Areas which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.
 - National Protected Areas Expansion Strategy (NPAES) (DFFE, 2022b) and Mpumalanga Protected Areas Expansion Strategy (MPAES) – The National Protected Area Expansion Strategy (NPAES) provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and are therefore, of high importance for biodiversity, climate resilience

and freshwater protection. In accordance with this, the MPAES was also developed to achieve a similar goal.

- Conservation/Biodiversity Sector Plans:

The Northern Cape Biodiversity Spatial Plan (NCBSP) (2024), developed by the Northern Cape Department of Environment and Nature Conservation (DENC) in collaboration with SANBI, provides the latest spatial framework for biodiversity conservation in the province. This plan updates and replaces the 2016 Northern Cape CBA Map, aiming to guide sustainable land use and inform environmental decision-making in line with national biodiversity legislation.

The BSP defines the following categories: Protected Areas, Critical Biodiversity Areas (CBA), subdivided into CBA 1 and CBA 2, and Ecological Support Areas (ESA).

- Protected Areas (PAs)

Protected Areas are formally declared under the National Environmental Management: Protected Areas Act (Act 57 of 2003) and are listed on the South African Protected Area Database. In the Northern Cape, these include nature reserves, protected environments, world heritage sites, forest nature reserves, and National Parks. Old ordinance reserves are included. These older reserves still require verification to confirm their current status and contribution towards biodiversity targets. Protected Areas form the core of the province's conservation estate and are critical for safeguarding key biodiversity assets.

- Critical Biodiversity Areas (CBAs)

The BSP delineates Critical Biodiversity Areas (CBAs) in accordance with the Technical Guidelines for CBA Maps (SANBI, 2017). CBAs are planning units (PUs) outside of formally Protected Areas that must remain in good ecological condition to meet biodiversity targets for ecosystems, species, and ecological processes.

- Critical Biodiversity Area 1 (CBA 1)

CBA 1 areas are the most important biodiversity areas. CBA 1s include threatened vegetation types. These areas are considered irreplaceable for achieving conservation goals and must be maintained in a natural or near-natural state.

- Critical Biodiversity Area 2 (CBA 2)

While still important for biodiversity conservation, CBA 2s are considered slightly less irreplaceable than CBA 1s but should also be maintained in a natural or near-natural state to support overall conservation objectives.

- Ecological Support Areas (ESAs)

Ecological Support Areas (ESAs) are identified to support the ecological functioning of CBAs and to maintain landscape connectivity through ecological corridors. ESAs include protected area buffers (such as unique buffers for National Parks and a default 5 km buffer for Nature Reserves), climate change resilience areas, landscape structural elements (corridors), Kamfers Dam (Kimberley), and all rivers except those classified as threatened. ESAs play a crucial role in supporting core biodiversity areas and facilitating ecological processes across the landscape.

- A new set of Key Biodiversity Areas (KBA) specific to South Africa has been identified using the Global Standard for the Identification of Key Biodiversity Areas version 1.2 (IUCN 2016), applied to South African species and ecosystems. KBAs are critical sites that play a vital role in maintaining global biodiversity by serving as essential habitats for species. The identification of KBAs enables governments and civil society to pinpoint key locations crucial for species and their habitats worldwide. This understanding facilitates collaborative efforts to manage and conserve these areas, thereby safeguarding global biological diversity and supporting international biodiversity objectives. Unlike the Important Bird Areas (IBAs), which primarily focus on birds, the KBA framework encompasses a broader spectrum of biodiversity, including mammals, amphibians, plants, and other taxa. BirdLife South Africa (BLSA), in consultation with the KBA National Coordination Group, has opted to retire IBAs and integrate KBAs into its conservation strategy. This strategic shift acknowledges the necessity of investing resources effectively to protect avian and other macroecological elements at the site level within a comprehensive framework of biodiversity conservation (KBA NCG, 2024).; and
- Freshwater Ecology:
 - Strategic Water Source Areas (SWSAs) (Le Maitre *et al*, 2018) – SWSAs are defined as areas of land that supply a quantity of mean annual surface water runoff in relation to their size and therefore, contribute considerably to the overall water supply of the country. These are key ecological infrastructure assets and the effective protection of surface water SWSAs areas is vital for national security because a lack of water security will compromise national security and human wellbeing.
 - South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (Van Deventer *et al*, 2018) – A South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was established during the National Biodiversity Assessment of 2018. It is a collection of data layers that represent the extent of river and inland wetland ecosystem types as well as pressures on these systems.
 - National Freshwater Ecosystem Priority Area (NFEPA) (Nel *et al.*, 2011) – The NFEPA database provides strategic spatial priorities for conserving the country's freshwater ecosystems and associated biodiversity as well as supporting sustainable use of water resources.
- Mining and Biodiversity Guidelines

The Mining and Biodiversity Guidelines (2013) was developed by the Department of Mineral Resources, the Chamber of Mines, the SANBI and the South African Mining and Biodiversity Forum, with the intention to find a balance between economic growth and environmental sustainability. The Guideline is envisioned as a tool to “foster a strong relationship between biodiversity and mining, which will eventually translate into best practice within the mining sector. It provides a tool to facilitate the sustainable development of South Africa’s mineral resources, in a way that enables regulators, industry and practitioners to minimise the impact of mining on the country’s biodiversity and ecosystem services. It provides the mining sector with a practical, user- friendly manual for integrating biodiversity considerations into the planning processes and managing biodiversity during the operational phases of a mine, from exploration through to closure. The Guideline provides explicit direction in terms of where: mining-related impacts are legally prohibited; biodiversity priority areas may present high risks for mining projects; and biodiversity may limit the potential for mining.

In identifying biodiversity priority areas, which have different levels of risk against mining, the Guideline categorises biodiversity priority areas into four categories of biodiversity priority areas

in relation to their importance from a biodiversity and ecosystem service point of view as well as the implications for mining in these areas:

- A) Legally protected areas, where mining is prohibited;
- B) Areas of highest biodiversity importance, which are at the highest risk for mining;
- C) Areas of high biodiversity importance, which are at a high risk for mining; and
- D) Areas of moderate biodiversity importance, which are at a moderate risk for mining.

Table 7-1 presents the four different categories and the implications for mining within each of these categories.

Table 7-1 Summary of the Mining and Biodiversity Guidelines

Category	Biodiversity priority areas	Risk for mining	Implications for mining
A. Legally protected	<ul style="list-style-type: none"> Protected areas (including National Parks, Nature Reserves, World Heritage Sites, Protected Environments, Nature Reserves) Areas declared under Section 49 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) 	Mining prohibited	<p>Mining projects cannot commence as mining is legally prohibited. Although mining is prohibited in Protected Areas, it may be allowed in Protected Environments if both the Minister of Mineral Resources and Minister of Environmental Affairs approve it.</p> <p>In cases where mining activities were conducted lawfully in protected areas before Section 48 of the Protected Areas Act (No. 57 of 2003) came into effect, the Minister of Environmental Affairs may, after consulting with the Minister of Mineral Resources, allow such mining activities to continue, subject to prescribed conditions that reduce environmental impacts.</p>
B. Highest biodiversity importance	<ul style="list-style-type: none"> CE and EN CBAs (or equivalent areas) from provincial spatial biodiversity plans River and wetland Freshwater Ecosystem Priority Areas (FEPAs) and a 1 km buffer around these FEPAs Ramsar Sites 	Highest risk for mining	<p>Environmental screening, environmental impact assessment (EIA) and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, and to provide site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making for mining, water use licenses, and EAs.</p> <p>If they are confirmed, the likelihood of a fatal flaw for new mining projects is very high because of the significance of the biodiversity features in these areas and the associated ecosystem services. These areas are viewed as necessary to ensure protection of biodiversity, environmental sustainability, and human well-being.</p> <p>An EIA should include the strategic assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity. This assessment should fully consider the environmental sensitivity of the area, the overall environmental and socio-economic costs and benefits of mining, as well as the potential strategic importance of the minerals to the country. Authorisations may well not be granted. If granted, the authorisation may set limits on allowed activities and impacts and may specify biodiversity offsets that would be written into license agreements and/or authorisations.</p>

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Category	Biodiversity priority areas	Risk for mining	Implications for mining
C. High biodiversity importance	<ul style="list-style-type: none"> Protected area buffers (including buffers around National Parks, World Heritage Sites* and Nature Reserves) Transfrontier Conservation Areas (remaining areas outside of formally proclaimed protected areas) Other identified priorities from provincial spatial biodiversity plans High water yield areas Coastal Protection Zone Estuarine functional zone 	High risk for mining	<p>These areas are important for conserving biodiversity, for supporting or buffering other biodiversity priority areas, and maintaining important ecosystem services for particular communities or the country as a whole.</p> <p>An EIA should include an assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity.</p> <p>Mining options may be limited in these areas, and limitations for mining projects are possible.</p> <p>Authorisations may set limits and specify biodiversity offsets that would be written into license agreements and/or authorisations.</p>
D. Moderate biodiversity importance	<ul style="list-style-type: none"> Ecological support areas Vulnerable ecosystems Focus areas for protected area expansion (land-based and offshore protection) 	Moderate risk for mining	<p>These areas are of moderate biodiversity value.</p> <p>EIAs and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, identifying features (e.g. threatened species) not included in the existing datasets, and on providing site-specific information to guide the application of the mitigation hierarchy.</p> <p>Authorisations may set limits and specify biodiversity offsets that would be written into license agreements and/or authorisations.</p>

7.1.2 Desktop Flora Assessment

The desktop flora assessment encompassed an assessment of all the vegetation units and habitat types within the PAOI as well as the identification of expected plant species and any locally occurring flora SCC.

The Vegetation of South Africa, Lesotho, and Swaziland (Mucina & Rutherford, 2006) and the 2018 Terrestrial & Freshwater Assessment by SANBI (2018) was used to identify the vegetation types that would have occurred under natural or pre-anthropogenically altered conditions. Furthermore, the Global Biodiversity Information Facility (GBIF.org (09 April 2026) GBIF Occurrence Download <https://doi.org/10.15468/dl.kpsrbz>) database was accessed to compile a list of expected flora species within the PAOI (Figure 7-1). The Red List of South African Plants website (SANBI, 2016) was used to provide the most current account of the national conservation status of flora.



Figure 7-1 *Map illustrating the extent of area used to obtain the expected flora and fauna species list from the GBIF database.*

The latest information regarding provincially, and nationally protected flora was obtained from the following published legislative sources:

- Provincially Protected Plant Species (Northern Cape Nature Conservation Act of 2009);
- Nationally Protected Plant Species (The 2022 lists of Threatened or Protected Species (TOPS), published in terms of Section 56(1) of the NEM:BA No. 10 of 2004); and
- List of Nationally Protected Tree Species (DEFF, 2022).

7.1.3 Desktop Fauna Assessment

The Global Biodiversity Information Facility (GBIF.org (09 April 2026) GBIF Occurrence Download <https://doi.org/10.15468/dl.kpsrbz>) database was accessed to compile a list of expected fauna (mammal, reptile and amphibian) species within the PAOI (Figure 7-1).

- Compiling an expected avifauna list generated from the South African Bird Atlas Project 2 (SABAP2) (<https://sabap2.birdmap.africa/>) using pentads: 2910_1935; 2910_2010; 2915_1935; 2915_1950; 2915_2005; 2915_2015; 2920_1935; 2920_1940; 2920_1945; 2920_1955; 2920_2000; 2920_2005; 2920_2010; 2920_2015; 2925_1935; 2925_1940; 2925_1950; 2925_2000; 2925_2005; 2925_2010; 2925_2015; 2930_1955; 2930_2000; 2930_2005
- South Africa's official site for Species Information and National Red Lists (SANBI, 2022) was used to provide the most current national Red-List status of fauna. The latest information regarding provincially, and nationally protected fauna was obtained from the following published legislative lists:

- Provincially Protected Animal Species (Northern Cape Nature Conservation Act of 2009); and
- Nationally Protected Wildlife species (The 2007 lists of Threatened or Protected Species (TOPS), published in terms of Section 56(1) of the NEM:BA No. 10 of 2004).

7.1.4 Vegetation & Flora Survey

The wet season fieldwork and sample sites were placed within targeted areas (i.e., target sites) perceived as ecologically sensitive based on the preliminary interpretation of satellite imagery (Google Corporation) and GIS analysis (which included the latest applicable biodiversity datasets) available prior to the fieldwork. The focus of the fieldwork was, therefore, to maximise coverage and navigate to each target site in the field in order to perform a rapid vegetation and ecological assessment at each sample site.

Homogenous vegetation units were subjectively identified using satellite imagery and existing land cover maps (confirmed during the field survey). The floristic diversity and search for protected plants and flora SCC were conducted through timed meanders within representative habitat units delineated during the desktop assessment. Emphasis was placed on sensitive habitats, especially those overlapping with the PAOI.

The timed random meander method is a highly efficient method for conducting floristic analysis, specifically in detecting protected plants and flora SCC and maximising floristic coverage. In addition, the method is time and cost effective and highly suited for compiling observed flora species lists and therefore gives a rapid indication of flora diversity. The timed meander search was performed based on the original technique described by Goff *et al.* (1982). Suitable habitat for SCC were identified according to Raimondo *et al.* (2009) and targeted as part of the timed meanders.

At each sample site notes were made regarding current impacts (e.g., roads, erosion etc.), and this included the subjective recording of dominant vegetation species and any sensitive features (e.g., wetlands, rock outcrops etc.). In addition, opportunistic observations were made while navigating through the area.

Species were identified in field wherever possible. If they could not be identified in the field, field guides and texts were used. Relevant field guides and texts consulted for identification purposes included, but was not limited, to the following:

- Identification Guide to Southern African Grasses: An Identification Manual with Keys, Descriptions, and Distributions (Fish *et al.*, 2015);
- A Field Guide to Wild Flowers (Pooley, 1998);
- Problem Plants and Alien Weeds of South Africa (Bromilow, 2018);
- Field Guide to Succulents in Southern Africa (Smith *et al.*, 2017);
- Field Guide to Wildflowers of South Africa (Manning, 2009); and
- iNaturalist. Available at <https://www.inaturalist.org/home>

7.1.4.1 Fauna Survey

The faunal component of this report pertains only to non-volant mammals, avifauna and herpetofauna (reptiles and amphibians). The faunal field survey utilised a variety of sampling techniques, including but not limited to:

- Visual and auditory searches: This involves strategic meandering and the use of binoculars and specialist camera equipment to view species from a distance without them being disturbed;
- Active hand-searches: Used for species that shelter in or under particular micro-habitats (typically rocks, exfoliating rock outcrops, fallen trees, leaf litter, bark etc.); and
- The identification of tracks and signs, and listening to species calls.

Relevant field guides and texts consulted for identification purposes included the following:

- The Mammals of the Southern African Subregion (Skinner & Chimimba, 2005);
- Field Guide to Snakes and other Reptiles of Southern Africa (Branch, 1998);
- A Complete Guide to the Snakes of Southern Africa (Marais, 2004);
- Atlas and Red List of the Reptiles of South Africa, Lesotho and Swaziland (Bates et al, 2014);
- A Complete Guide to the Frogs of Southern Africa (du Preez and Carruthers, 2009);
- Stuarts' Field Guide to Mammals of Southern Africa including Angola, Zambia & Malawi (Stuart and Stuart, 2015); and
- A Field Guide to the Tracks and Signs of Southern and East African Wildlife (Stuart and Stuart, 2000).

7.2 Appendix B: Terrestrial Site Ecological Importance

The different habitat types within the PAOI were delineated and identified based on observations made during the field survey, and information from available satellite imagery. These habitat types were assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of SCC and their ecosystem processes.

Site Ecological Importance (SEI) is a function of the Biodiversity Importance (BI) of the receptor (e.g., SCC, the vegetation/fauna community or habitat type present in the PAOI) and Receptor Resilience (RR) (its resilience to impacts).

BI is a function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor. The criteria for the CI and FI ratings are provided in Table 7-2 and Table 7-3 respectively.

Table 7-2 Summary of Conservation Importance (CI) criteria

Conservation Importance	Fulfilling Criteria
Very High	Confirmed or highly likely occurrence of Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Extremely Rare or CR species that have a global extent of occurrence (EOO) of < 10 km ² . Any area of natural habitat of a CR ecosystem type or large area (> 0.1% of the total ecosystem type extent) of natural habitat of an EN ecosystem type. Globally significant populations of congregatory species (> 10% of global population).
High	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining. Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type. Presence of Rare species. Globally significant populations of congregatory species (> 1% but < 10% of global population).

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Medium	Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals. Any area of natural habitat of threatened ecosystem type with status of VU. Presence of range-restricted species. > 50% of receptor contains natural habitat with potential to support SCC.
Low	No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC.
Very Low	No confirmed and highly unlikely populations of SCC. No confirmed and highly unlikely populations of range-restricted species. No natural habitat remaining.

Table 7-3 Summary of Functional Integrity (FI) criteria

Functional Integrity	Fulfilling Criteria
Very High	Very large (> 100 ha) intact area for any conservation status of ecosystem type or > 5 ha for CR ecosystem types. High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches. No or minimal current negative ecological impacts, with no signs of major past disturbance.
High	Large (> 20 ha but < 100 ha) intact area for any conservation status of ecosystem type or > 10 ha for EN ecosystem types. Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches. Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation potential.
Medium	Medium (> 5 ha but < 20 ha) semi-intact area for any conservation status of ecosystem type or > 20 ha for VU ecosystem types. Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.
Low	Small (> 1 ha but < 5 ha) area. Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area. Low rehabilitation potential. Several minor and major current negative ecological impacts.
Very Low	Very small (< 1 ha) area. No habitat connectivity except for flying species or flora with wind-dispersed seeds. Several major current negative ecological impacts.

BI can be derived from a simple matrix of CI and FI as provided in Table 7-4.

Table 7-4 Matrix used to derive Biodiversity Importance (BI) from Functional Integrity (FI) and Conservation Importance (CI)

Biodiversity Importance		Conservation Importance				
		Very High	High	Medium	Low	Very Low
Functional Integrity	Very High	Very High	Very High	High	Medium	Low
	High	Very High	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very Low
	Low	Medium	Medium	Low	Low	Very Low
	Very Low	Medium	Low	Very Low	Very Low	Very Low

The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor, as summarised in Table 7-5.

Table 7-5 Summary of Receptor Resilience (RR) criteria

Resilience	Fulfilling Criteria
Very High	Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
High	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Medium	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Low	Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Very Low	Habitat that is unable to recover from major impacts, or species that are unlikely to: (i) remain at a site even when a disturbance or impact is occurring, or (ii) return to a site once the disturbance or impact has been removed.

After the determination of BI and RR, the SEI can be ascertained using the matrix as provided in Table 7-6.

Table 7-6 Matrix used to derive Site Ecological Importance from Receptor Resilience (RR) and Biodiversity Importance (BI)

Site Ecological Importance		Biodiversity Importance				
		Very High	High	Medium	Low	Very Low
Receptor Resilience	Very Low	Very High	Very High	High	Medium	Low
	Low	Very High	Very High	High	Medium	Very Low
	Medium	Very High	High	Medium	Low	Very Low
	High	High	Medium	Low	Very Low	Very Low
	Very High	Medium	Low	Very Low	Very Low	Very Low

Interpretation of the SEI in the context of the proposed project is provided in Table 7-7.

Table 7-7 ***Guideline for interpreting Site Ecological Importance in the context of proposed activities***

Site Ecological Importance	Interpretation in relation to proposed development activities
Very High	Avoidance mitigation – no destructive development activities should be considered. Offset mitigation not acceptable/not possible (i.e., last remaining populations of species, last remaining good condition patches of ecosystems/unique species assemblages). Destructive impacts for species/ecosystems where persistence target remains.
High	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Low	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Very Low	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

The SEI evaluated for each taxon can be combined into a single multi-taxon evaluation of SEI for the assessment area. Either a combination of the maximum SEI for each receptor should be applied, or the SEI may be evaluated only once per receptor but for all necessary taxa simultaneously. For the latter, justification of the SEI for each receptor is based on the criteria that conforms to the highest CI and FI, and the lowest RR across all taxa.

7.3 Appendix D: Impact Assessment

The Environmental Impact Assessment rating procedure as provided by the client, EIMS.

Table 7-8 Criteria for Determining Impact Consequence

Nature	-1	Likely to result in a negative/ detrimental impact
	1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. Highly localised, limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property or site boundary, or the area within a few hundred meters of the site)
	3	Local (i.e. beyond the site boundary within the Local administrative boundary (e.g. Local Municipality) or within consistent local geographical features, or the area within 5 km of the site)
	4	Regional (i.e. Far beyond the site boundary, beyond the Local administrative boundaries within the Regional administrative boundaries (e.g. District Municipality), or extends into different distinct geographical features, or extends between 5 and 50 km from the site).
	5	Provincial / National / International (i.e. extends into numerous distinct geographical features, or extends beyond 50 km from the site).
Duration	1	Immediate (<1 year, quickly reversible)
	2	Short term (1-5 years, less than project lifespan)
	3	Medium term (6-15 years)
	4	Long term (15-65 years, the impact will cease after the operational life span of the project)
	5	Permanent (>65 years, no mitigation measure of natural process will reduce the impact after construction/ operation/ decommissioning).
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected)
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected, or affected environmental components are already degraded)
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; moderate improvement for +ve impacts; or where change affects area of potential conservation or other value, or use of resources).
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease; high improvement for +ve impacts; or where change affects high conservation value areas or species of conservation concern)
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease, substantial improvement for +ve impacts; or disturbance to pristine areas of critical conservation value or critically endangered species)
Reversibility	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost.
	4	Impact is reversible only by incurring prohibitively high time and cost.
	5	Irreversible Impact
Probability	1	Improbable (Rare, the event may occur only in exceptional circumstances, the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <5% chance).
	2	Low probability (Unlikely, impact could occur but not realistically expected; >5% and <20% chance).
	3	Medium probability (Possible, the impact may occur; >20% and <50% chance).
	4	High probability (Likely, it is most probable that the impact will occur- > 50 and <90% chance).
	5	Definite (Almost certain, the impact is expected to, or will, occur, >90% chance).
Cumulative Impact	1	Low: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.

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	2	Medium: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.
	3	High: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/definite that the impact will result in spatial and temporal cumulative change.
Irreplaceable loss of resources	1	Low: Where the impact is unlikely to result in irreplaceable loss of resources.
	2	Medium: Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	3	High: Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).
Degree of Confidence	Low	<30% certain of impact prediction
	Medium	>30 and < 60% certain of impact prediction
	High	>60% certain of impact prediction

Table 7-9 Environmental Significance Rating

Significance Rating	Description
<-25	Very High (Impacts in this class are extremely significant and pose a very high environmental risk. In certain instances these may represent a fatal flaw. They are likely to have a major influence on the decision and may be difficult or impossible to mitigate. Offset's may be necessary.
<-13.75 to -25	High negative (These impacts are significant and must be carefully considered in the decision-making process. They have a high environmental risk or impact and require extensive mitigation measures).
-8.5 to -13.75	Medium-High negative (i.e. Impacts in this class are more substantial and could have a significant environmental risk. They may influence the decision to develop in the area and require more robust mitigation measures).
<-4.25 to <-8.5	Medium- Low negative (i.e. These impacts are slightly more significant than low impacts but still do not pose a major environmental risk. They might require some mitigation measures but are generally manageable).

7.4 Appendix E: Expected Species Lists

7.4.1 Expected Flora Species

Family Name	Scientific Name	RSA Status	Regional Conservation status (SANBI)
Acanthaceae	<i>Acanthopsis disperma</i>	Not endemic	LC
Acanthaceae	<i>Acanthopsis hoffmannseggiana</i>	Indigenous	DDT
Acanthaceae	<i>Barleria rigida</i>	Indigenous	LC
Acanthaceae	<i>Blepharis macra</i>	Indigenous	LC
Acanthaceae	<i>Blepharis mitrata</i>	Indigenous	LC
Acanthaceae	<i>Monechma divaricatum</i>	Indigenous	LC
Acanthaceae	<i>Monechma incanum</i>	Indigenous	LC
Acanthaceae	<i>Monechma spartioides</i>	Indigenous	LC
Acanthaceae	<i>Acanthopsis villosa</i>	Indigenous	LC
Aizoaceae	<i>Aizoon africanum</i>	Indigenous	LC
Aizoaceae	<i>Aizoon canariense</i>	Indigenous	LC
Aizoaceae	<i>Aizoon fruticosum</i>	Indigenous	LC
Aizoaceae	<i>Aizoon meianum</i>	Indigenous	LC
Aizoaceae	<i>Aizoon sarcophyllum</i>	Indigenous	LC
Aizoaceae	<i>Antimima vanzijlii</i>	Endemic	LC
Aizoaceae	<i>Argyroderma fissum</i>	Endemic	LC
Aizoaceae	<i>Cheiridopsis excavata</i>	Indigenous	LC
Aizoaceae	<i>Cheiridopsis vanzylii</i>	Indigenous; Endemic	LC
Aizoaceae	<i>Conophytum friedrichiae</i>	Indigenous	LC
Aizoaceae	<i>Conophytum fulleri</i>	Indigenous; Endemic	LC
Aizoaceae	<i>Conophytum limpidum</i>	Indigenous; Endemic	NT
Aizoaceae	<i>Conophytum praesectum</i>	Indigenous; Endemic	LC
Aizoaceae	<i>Dinteranthus microspermus</i>	Indigenous; Endemic	LC
Aizoaceae	<i>Dinteranthus vanzylii</i>	Indigenous; Endemic	DDT
Aizoaceae	<i>Dinteranthus wilmotianus</i>	Indigenous; Endemic	NT
Aizoaceae	<i>Drosanthemum calycinum</i>	Indigenous; Endemic	NT
Aizoaceae	<i>Drosanthemum latipetalum</i>	Endemic	LC
Aizoaceae	<i>Drosanthemum schoenlandianum</i>	Endemic	LC
Aizoaceae	<i>Lithops julii</i>	Indigenous	LC
Aizoaceae	<i>Lithops olivacea</i>	Indigenous; Endemic	VU
Aizoaceae	<i>Mesembryanthemum coriarium</i>	Indigenous	LC
Aizoaceae	<i>Mesembryanthemum crystallinum</i>		LC
Aizoaceae	<i>Mesembryanthemum gessertianum</i>	Unconfirmed	Unconfirmed
Aizoaceae	<i>Mesembryanthemum guerichianum</i>	Indigenous	LC
Aizoaceae	<i>Mesembryanthemum noctiflorum</i>	Indigenous	LC
Aizoaceae	<i>Mesembryanthemum subnodosum</i>	Unconfirmed	LC
Aizoaceae	<i>Mesembryanthemum tetragonum</i>	Indigenous	LC
Aizoaceae	<i>Ruschia muricata</i>	Indigenous	LC
Aizoaceae	<i>Ruschia spinosa</i>	Indigenous	LC
Aizoaceae	<i>Stomatium alboroseum</i>	Indigenous; Endemic	LC
Aizoaceae	<i>Tetragonia arbuscula</i>	Indigenous; Endemic	LC
Aizoaceae	<i>Tetragonia calycina</i>	Indigenous; Endemic	LC

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Aizoaceae	<i>Tetragonia fruticosa</i>	Indigenous; Endemic	LC
Aizoaceae	<i>Tetragonia nigrescens</i>	Indigenous; Endemic	LC
Aizoaceae	<i>Tetragonia reduplicata</i>	Indigenous; Endemic	LC
Aizoaceae	<i>Trianthema parvifolium</i>	Indigenous; Endemic	LC
Aizoaceae	<i>Trichodiadema pomeridianum</i>	Indigenous; Endemic	DDT
Amaranthaceae	<i>Amaranthus schinzianus</i>	Indigenous; Endemic	LC
Amaranthaceae	<i>Atriplex lindleyi</i>	Indigenous	NE
Amaranthaceae	<i>Caroxylon barbatum</i>	Not Indigenous	NE
Amaranthaceae	<i>Caroxylon melananthum</i>	Indigenous	LC
Amaranthaceae	<i>Caroxylon rabieanum</i>	Endemic	LC
Amaranthaceae	<i>Chenopodium mucronatum</i>	Indigenous	LC
Amaranthaceae	<i>Hermbsstaedtia glauca</i>	Indigenous	LC
Amaranthaceae	<i>Salsola kali</i>	Indigenous	LC
Amaranthaceae	<i>Sericocoma avolans</i>	Indigenous	LC
Amaranthaceae	<i>Sericocoma pungens</i>	Not Indigenous	NE
Amaryllidaceae	<i>Brunsvigia comptonii</i>	Indigenous; Endemic	LC
Amaryllidaceae	<i>Brunsvigia gariensis</i>	Indigenous; Endemic	EN
Amaryllidaceae	<i>Hessea stenosphon</i>	Indigenous; Endemic	LC
Anacampserotaceae	<i>Anacampseros baeseckei</i>	Indigenous	LC
Anacampserotaceae	<i>Anacampseros filamentosa</i>	Indigenous	LC
Anacampserotaceae	<i>Anacampseros quinaria</i>	Indigenous	EN
Anacampserotaceae	<i>Avonia albissima</i>	Indigenous	LC
Anacampserotaceae	<i>Avonia papyracea</i>	Indigenous	LC
Anacampserotaceae	<i>Avonia quinaria</i>	Indigenous	EN
Anacampserotaceae	<i>Avonia recurvata</i>	Indigenous	LC
Anacardiaceae	<i>Searsia burchellii</i>	Indigenous	LC
Apocynaceae	<i>Ceropegia cactiformis</i>	Indigenous	LC
Apocynaceae	<i>Gomphocarpus filiformis</i>	Indigenous	LC
Apocynaceae	<i>Ceropegia gordonii</i>	Indigenous	LC
Apocynaceae	<i>Ceropegia marlothii</i>	Indigenous	LC
Apocynaceae	<i>Fockea comaru</i>	Indigenous	LC
Apocynaceae	<i>Hoodia gordonii</i>	Indigenous	DDD
Apocynaceae	<i>Microloma incanum</i>	Indigenous	LC
Apocynaceae	<i>Microloma longitubum</i>		
Asparagaceae	<i>Albuca glandulifera</i>		
Asparagaceae	<i>Albuca setosa</i>		
Asparagaceae	<i>Albuca spiralis</i>		
Asparagaceae	<i>Asparagus exuvialis</i>		
Asparagaceae	<i>Drimia intricata</i>		
Asphodelaceae	<i>Aloe claviflora</i>	Indigenous	LC
Asphodelaceae	<i>Aloe dichotoma</i>		
Asphodelaceae	<i>Aloidendron dichotomum</i>	Indigenous; Near-endemic	VU
Asphodelaceae	<i>Bulbine striata</i>	Indigenous; Endemic	LC
Asphodelaceae	<i>Gonialoe variegata</i>	Indigenous	LC
Asphodelaceae	<i>Haworthiopsis tessellata</i>	Indigenous	LC
Aspleniaceae	<i>Asplenium cordatum</i>		

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Asteraceae	<i>Amellus nanus</i>		
Asteraceae	<i>Amellus tridactylus</i>		
Asteraceae	<i>Amphiglossa corrudifolia</i>		
Asteraceae	<i>Arctotis fastuosa</i>		
Asteraceae	<i>Arctotis leiocarpa</i>	Indigenous	LC
Asteraceae	<i>Athanasia minuta</i>	Indigenous	LC
Asteraceae	<i>Berkheya annectens</i>		
Asteraceae	<i>Crassothonna protecta</i>		
Asteraceae	<i>Curio avasimontanus</i>		
Asteraceae	<i>Dicoma capensis</i>	Indigenous	LC
Asteraceae	<i>Dimorphotheca pinnata</i>		
Asteraceae	<i>Dimorphotheca sinuata</i>		
Asteraceae	<i>Eriocephalus ambiguus</i>		
Asteraceae	<i>Eriocephalus merxmuelieri</i>		
Asteraceae	<i>Eriocephalus pauperrimus</i>		
Asteraceae	<i>Eumorphia dregeana</i>		
Asteraceae	<i>Felicia burkei</i>		
Asteraceae	<i>Felicia clavipilosa</i>	Indigenous	LC
Asteraceae	<i>Felicia namaquana</i>	Indigenous	LC
Asteraceae	<i>Foveolina dichotoma</i>	Indigenous	LC
Asteraceae	<i>Galeomma stenolepis</i>		
Asteraceae	<i>Galgera decurrens</i>		
Asteraceae	<i>Gazania jurineifolia</i>		
Asteraceae	<i>Gazania lichtensteinii</i>	Indigenous	LC
Asteraceae	<i>Geigeria ornativa</i>		
Asteraceae	<i>Gutenbergia rangei</i>		
Asteraceae	<i>Helichrysum argyrosphaerum</i>		
Asteraceae	<i>Helichrysum gariepinum</i>		
Asteraceae	<i>Helichrysum herniarioides</i>		
Asteraceae	<i>Helichrysum pulchellum</i>		
Asteraceae	<i>Helichrysum pumilio</i>	Indigenous	LC
Asteraceae	<i>Hirpicium echinus</i>		
Asteraceae	<i>Lasiopogon glomerulatus</i>		
Asteraceae	<i>Lasiopogon muscoides</i>		
Asteraceae	<i>Leysera tenella</i>		
Asteraceae	<i>Nolletia arenosa</i>		
Asteraceae	<i>Oedera humilis</i>		
Asteraceae	<i>Osteospermum armatum</i>		
Asteraceae	<i>Othonna auriculifolia</i>		
Asteraceae	<i>Pentzia lanata</i>		
Asteraceae	<i>Pteronia acuminata</i>		
Asteraceae	<i>Pteronia ciliata</i>		
Asteraceae	<i>Pteronia leucoclada</i>		
Asteraceae	<i>Pteronia mucronata</i>		
Asteraceae	<i>Pteronia rangei</i>		

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Asteraceae	<i>Senecio arenarius</i>		
Asteraceae	<i>Senecio consanguineus</i>		
Asteraceae	<i>Senecio niveus</i>	Indigenous	LC
Asteraceae	<i>Senecio sisymbriifolius</i>		
Asteraceae	<i>Ursinia nana</i>	Indigenous	LC
Aytoniaceae	<i>Plagiochasma rupestre</i>		
Bignoniaceae	<i>Rhigozum trichotomum</i>		
Brassicaceae	<i>Heliophila deserticola</i>		
Brassicaceae	<i>Heliophila trifurca</i>	Indigenous	LC
Brassicaceae	<i>Lepidium divaricatum</i>		
Brassicaceae	<i>Lepidium englerianum</i>		
Campanulaceae	<i>Wahlenbergia divergens</i>	Indigenous; Endemic	DDT
Campanulaceae	<i>Wahlenbergia patula</i>		
Capparaceae	<i>Boscia foetida</i>	Indigenous	LC
Cleomaceae	<i>Coalisina semitetrandra</i>		
Cleomaceae	<i>Kersia paxii</i>		
Colchicaceae	<i>Colchicum bellum</i>		
Colchicaceae	<i>Ornithoglossum vulgare</i>		
Crassulaceae	<i>Adromischus schuldianus</i>		
Crassulaceae	<i>Crassula columnaris</i>	Indigenous	LC
Crassulaceae	<i>Crassula corallina</i>	Indigenous	LC
Crassulaceae	<i>Crassula garibina subsp. glabra</i>	Indigenous	Rare
Crassulaceae	<i>Crassula mesembrianthemopsis</i>		
Crassulaceae	<i>Crassula obovata</i>		
Crassulaceae	<i>Tylecodon sulphureus</i>		
Crassulaceae	<i>Tylecodon sulphureus var. amianus</i>	Indigenous; Endemic	Rare
Cucurbitaceae	<i>Kedrostis africana</i>	Indigenous	LC
Cucurbitaceae	<i>Corallocarpus dissectus</i>	Indigenous	LC
Cucurbitaceae	<i>Cucumis africanus</i>		
Cucurbitaceae	<i>Cucumis myriocarpus</i>		
Cucurbitaceae	<i>Kedrostis africana</i>	Indigenous	LC
Cyperaceae	<i>Cyperus indecorus</i>	Indigenous	LC
Ebenaceae	<i>Diospyros acocksii</i>		
Ebenaceae	<i>Euclea undulata</i>		
Euphorbiaceae	<i>Euphorbia friedrichiae</i>		
Euphorbiaceae	<i>Euphorbia fusca</i>		
Euphorbiaceae	<i>Euphorbia inaequilatera</i>	Indigenous	LC
Euphorbiaceae	<i>Euphorbia mauritanica</i>		
Euphorbiaceae	<i>Euphorbia spinea</i>		
Fabaceae	<i>Calobota lotononoides</i>		
Fabaceae	<i>Calobota spinescens</i>		
Fabaceae	<i>Crotalaria pearsonii</i>		
Fabaceae	<i>Cyamopsis serrata</i>		
Fabaceae	<i>Indigostrum niveum</i>		
Fabaceae	<i>Indigofera alternans</i>		
Fabaceae	<i>Indigofera heterotricha</i>		

Sandgat Prospecting Right

Fabaceae	<i>Leobordea platycarpa</i>	Indigenous	LC
Fabaceae	<i>Lessertia annularis</i>	Indigenous	LC
Fabaceae	<i>Lessertia eremicola</i>		
Fabaceae	<i>Lessertia frutescens</i>		
Fabaceae	<i>Lotononis falcata</i>		
Fabaceae	<i>Lotononis lenticula</i>		
Fabaceae	<i>Lotononis rabenaviana</i>		
Fabaceae	<i>Melolobium adenodes</i>		
Fabaceae	<i>Melolobium candicans</i>		
Fabaceae	<i>Melolobium humile</i>		
Fabaceae	<i>Melolobium microphyllum</i>		
Fabaceae	<i>Parkinsonia africana</i>	Indigenous	LC
Fabaceae	<i>Requienia sphaerosperma</i>		
Fabaceae	<i>Xerocladia viridiramis</i>		
Fabroniaceae	<i>Fabronia pilifera</i>		
Geraniaceae	<i>Monsonia crassicaulis</i>	Indigenous	LC
Geraniaceae	<i>Monsonia luederitziana</i>		
Geraniaceae	<i>Monsonia salmoniflora</i>		
Geraniaceae	<i>Pelargonium nanum</i>		
Geraniaceae	<i>Pelargonium xerophyton</i>	Indigenous	LC
Gisekiaceae	<i>Gisekia africana</i>		
Gisekiaceae	<i>Gisekia pharnaceoides</i>		
Heliotropiaceae	<i>Heliotropium ciliatum</i>		
Heliotropiaceae	<i>Heliotropium curassavicum</i>		
Iridaceae	<i>Gladiolus orchidiflorus</i>		
Iridaceae	<i>Tritonia karoica</i>	Indigenous; Endemic	LC
Kewaceae	<i>Kewa salsoloides</i>	Indigenous	LC
Limeaceae	<i>Limeum aethiopicum</i>		
Limeaceae	<i>Limeum argute-carinatum</i>		
Limeaceae	<i>Limeum dinteri</i>		
Limeaceae	<i>Limeum myosotis</i>		
Limeaceae	<i>Limeum rhombifolium</i>		
Lophiocarpaceae	<i>Lophiocarpus polystachyus</i>		
Loranthaceae	<i>Septulina glauca</i>		
Loranthaceae	<i>Tapinanthus oleifolius</i>		
Malvaceae	<i>Hermannia abrotanoides</i>		
Malvaceae	<i>Hermannia bicolor</i>		
Malvaceae	<i>Hermannia marginata</i>		
Malvaceae	<i>Hermannia minutiflora</i>		
Malvaceae	<i>Hermannia spinosa</i>		
Malvaceae	<i>Hermannia stricta</i>		
Malvaceae	<i>Radyera urens</i>		
Meliaceae	<i>Nymania capensis</i>		
Menispermaceae	<i>Antizoma miersiana</i>		
Molluginaceae	<i>Hypertelis cerviana</i>		
Molluginaceae	<i>Hypertelis umbellata</i>		

Sandgat Prospecting Right

Molluginaceae	<i>Pharnaceum croceum</i>		
Molluginaceae	<i>Suessenguthiella scleranthoides</i>		
Montiniaceae	<i>Montinia caryophyllacea</i>		
Neuradaceae	<i>Grielum humifusum</i>	Indigenous	LC
Nyctaginaceae	<i>Boerhavia cordobensis</i>		
Nyctaginaceae	<i>Phaeoptilum spinosum</i>		
Oxalidaceae	<i>Oxalis pocockiae</i>		
Pedaliaceae	<i>Sesamum capense</i>		
Plumbaginaceae	<i>Dyerophytum africanum</i>	Indigenous	LC
Poaceae	<i>Aristida engleri</i>	Indigenous	LC
Poaceae	<i>Aristida diffusa</i>		
Poaceae	<i>Cenchrus ciliaris</i>		
Poaceae	<i>Centropodia glauca</i>		
Poaceae	<i>Chloris virgata</i>		
Poaceae	<i>Dactyloctenium aegyptium</i>		
Poaceae	<i>Digitaria eriantha</i>		
Poaceae	<i>Enneapogon cenchroides</i>		
Poaceae	<i>Enneapogon desvauxii</i>		
Poaceae	<i>Enneapogon scaber</i>	Indigenous	LC
Poaceae	<i>Eragrostis annulata</i>		
Poaceae	<i>Eragrostis biflora</i>		
Poaceae	<i>Eragrostis homomalla</i>		
Poaceae	<i>Eragrostis lehmanniana</i>	Indigenous	LC
Poaceae	<i>Eragrostis nindensis</i>	Indigenous	LC
Poaceae	<i>Eragrostis porosa</i>		
Poaceae	<i>Eragrostis procumbens</i>		
Poaceae	<i>Eragrostis rotifer</i>		
Poaceae	<i>Fingerhuthia africana</i>		
Poaceae	<i>Microchloa kunthii</i>		
Poaceae	<i>Oropetium capense</i>		
Poaceae	<i>Panicum arbusculum</i>		
Poaceae	<i>Phragmites australis</i>		
Poaceae	<i>Schmidtia kalahariensis</i>	Indigenous	LC
Poaceae	<i>Setaria verticillata</i>		
Poaceae	<i>Sporobolus nervosus</i>		
Poaceae	<i>Stipagrostis anomala</i>		
Poaceae	<i>Stipagrostis brevifolia</i>		
Poaceae	<i>Stipagrostis ciliata</i>		
Poaceae	<i>Stipagrostis fastigiata</i>		
Poaceae	<i>Stipagrostis namaquensis</i>		
Poaceae	<i>Stipagrostis obtusa</i>		
Poaceae	<i>Stipagrostis uniplumis</i>		
Poaceae	<i>Tragus berteronianus</i>		
Poaceae	<i>Tragus racemosus</i>		
Poaceae	<i>Tricholaena capensis</i>		
Portulacaceae	<i>Portulaca kermesina</i>		

Sandgat Prospecting Right

Pottiaceae	<i>Acaulon recurvatum</i>		
Pottiaceae	<i>Tortula atrovirens</i>		
Pteridaceae	<i>Cheilanthes kunzei</i>		
Ricciaceae	<i>Riccia albornata</i>		
Ricciaceae	<i>Riccia cavernosa</i>		
Rubiaceae	<i>Kohautia caespitosa</i>		
Scrophulariaceae	<i>Aptosimum elongatum</i>		
Scrophulariaceae	<i>Aptosimum lineare</i>		
Scrophulariaceae	<i>Aptosimum procumbens</i>		
Scrophulariaceae	<i>Aptosimum spinescens</i>	Indigenous	LC
Scrophulariaceae	<i>Diascia engleri</i>		
Scrophulariaceae	<i>Hebenstretia cordata</i>		
Scrophulariaceae	<i>Jamesbrittenia adpressa</i>	Indigenous	LC
Scrophulariaceae	<i>Jamesbrittenia aridicola</i>		
Scrophulariaceae	<i>Jamesbrittenia atropurpurea</i>		
Scrophulariaceae	<i>Jamesbrittenia integerrima</i>	Indigenous	LC
Scrophulariaceae	<i>Jamesbrittenia maxii</i>	Indigenous	LC
Scrophulariaceae	<i>Lyperia tristis</i>	Endemic	LC
Scrophulariaceae	<i>Manulea schaeferi</i>	Indigenous	LC
Scrophulariaceae	<i>Nemesia anisocarpa</i>	Indigenous	LC
Scrophulariaceae	<i>Nemesia maxii</i>	Indigenous	LC
Scrophulariaceae	<i>Peliostomum leucorrhizum</i>	Indigenous	LC
Scrophulariaceae	<i>Selago divaricata</i>	Indigenous	LC
Scrophulariaceae	<i>Zaluzianskya diandra</i>	Indigenous	LC
Scrophulariaceae	<i>Zaluzianskya sanorum</i>	Indigenous	LC
Solanaceae	<i>Lycium bosciifolium</i>	Indigenous	LC
Solanaceae	<i>Lycium cinereum</i>	Indigenous	LC
Solanaceae	<i>Lycium horridum</i>	Indigenous	LC
Solanaceae	<i>Lycium pillifolium</i>	Indigenous	LC
Solanaceae	<i>Lycium pumilum</i>	Indigenous	LC
Solanaceae	<i>Solanum burchellii</i>	Indigenous	NE
Solanaceae	<i>Solanum capense</i>	Indigenous	LC
Talinaceae	<i>Talinum tenuissimum</i>	Indigenous	LC
Tamaricaceae	<i>Tamarix hybr</i>	Invasive	NE
Thesiaceae	<i>Lacomucinaea lineata</i>	Indigenous	LC
Urticaceae	<i>Forsskaolea candida</i>	Indigenous	LC
Vahliaceae	<i>Vahlia capensis</i>	Indigenous	LC
Verbenaceae	<i>Chascanum garipense</i>	Indigenous	LC
Verbenaceae	<i>Chascanum pumilum</i>	Endemic	LC
Zygophyllaceae	<i>Augea capensis</i>	Endemic	LC
Zygophyllaceae	<i>Roepera lichtensteiniana</i>	Endemic	LC
Zygophyllaceae	<i>Sisyndite sparteia</i>	Endemic	LC
Zygophyllaceae	<i>Tetraena chrysopteros</i>	Endemic	LC
Zygophyllaceae	<i>Tetraena microcarpa</i>	Endemic	LC
Zygophyllaceae	<i>Tetraena retrofracta</i>	Not endemic	LC
Zygophyllaceae	<i>Tetraena simplex</i>	Indigenous	LC

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Zygophyllaceae	<i>Tribulus pentandrus</i>	Indigenous	LC
Zygophyllaceae	<i>Tribulus terrestris</i>	Indigenous	LC
Zygophyllaceae	<i>Tribulus zeyheri</i>	Indigenous	LC

7.4.2 Expected Mammal Species

Family	Scientific Name	Common Name	Regional Conservation Status (SANBI)	Global Conservation Status (IUCN)
Bovidae	<i>Raphicerus campestris</i>	Steenbok	LC	LC
Bovidae	<i>Antidorcas marsupialis</i>	Springbok	LC	LC
Canidae	<i>Otocyon megalotis</i>	Bat-eared Fox	LC	LC
Hyaenidae	<i>Proteles cristata</i>	Aardwolf	LC	LC
Hystriidae	<i>Hystrix africaeaustralis</i>	Cape Porcupine	LC	LC
Muridae	<i>Rattus rattus</i>	Black Rat	LC	LC
Orycteropodidae	<i>Orycteropus afer</i>	Aardvark	LC	LC
Sciuridae	<i>Xerus inauris</i>	Cape Ground Squirrel	LC	LC

7.4.3 Expected Reptile Species

Family	Scientific Name	Common Name	Regional Conservation Status (SANBI)	Global Conservation Status (IUCN)
Agamidae	<i>Agama aculeata</i>	Ground Agama	LC	LC
Chamaeleonidae	<i>Chamaeleo namaquensis</i>	Namaqua Chameleon	LC	LC
Cordylidae	<i>Karusasaurus polyzonus</i>	Karoo Girdled Lizard	LC	LC
Lacertidae	<i>Merole suborbitalis</i>	Suborbital Sand Lizard	LC	LC
Lacertidae	<i>Pedioplanis lineocellata</i>	Sand Lizard	LC	LC
Lacertidae	<i>Pedioplanis namaquensis</i>	Namaqua Sand Lizard	LC	LC
Psammophiidae	<i>Dipsina multimaculata</i>	Spotted Night Adder	LC	LC
Psammophiidae	<i>Psammophis notostictus</i>	Karoo Sand Snake	LC	LC
Scincidae	<i>Trachylepis sparsa</i>	Sparse Skink	LC	LC
Scincidae	<i>Trachylepis occidentalis</i>	Western Three-striped Skink	LC	LC
Scincidae	<i>Trachylepis variegata</i>	Variegated Skink	LC	LC
Testudinidae	<i>Psammobates tentorius</i>	Tent Tortoise	LC	LC
Typhlopidae	<i>Rhinotyphlops lalandei</i>	Delalande's Beaked Blind Snake	LC	LC

7.4.4 Expected Amphibian Species

Family	Scientific Name	Common Name	Regional Conservation Status (SANBI)	Global Conservation Status (IUCN)
Bufonidae	<i>Vandijkophrynus robinsoni</i>	Paradise Toad	LC	LC
Microhylidae	<i>Phrynomantis annectens</i>	Marbled Rubber Frog	LC	LC

7.4.5 Expected Avifauna Species

Common Name	Scientific Name	Family Name	Regional	Global
Acacia Pied Barbet	<i>Tricholaema leucomelas</i>	Lybiidae		
African Pipit	<i>Anthus cinnamomeus</i>	Motacillidae		
African Red-eyed Bulbul	<i>Pycnonotus nigricans</i>	Pycnonotidae		
Ant-eating Chat	<i>Myrmecocichla formicivora</i>	Muscicapidae		
Barn Swallow	<i>Hirundo rustica</i>	Hirundinidae		
Black-chested Prinia	<i>Prinia flavicans</i>	Cisticolidae		
Black-chested Snake Eagle	<i>Circaetus pectoralis</i>	Accipitridae		
Black-eared Sparrow-lark	<i>Eremopterix australis</i>	Alaudidae		
Black-headed Canary	<i>Serinus alario</i>	Fringillidae		
Black Harrier	<i>Circus maurus</i>	Accipitridae	EN	EN
Bokmakierie	<i>Telophorus zeylonus</i>	Malaconotidae		
Burchell's Courser	<i>Cursorius rufus</i>	Glareolidae	VU	LC
Cape Shoveler	<i>Spatula smithii</i>	Anatidae	NT	LC
Cape Sparrow	<i>Passer melanurus</i>	Passeridae		
Capped Wheatear	<i>Oenanthe pileata</i>	Muscicapidae		
Chat Flycatcher	<i>Melaenornis infuscatus</i>	Muscicapidae		
Chestnut-vented Warbler	<i>Curruca subcoerulea</i>	Sylviidae		
Common Quail	<i>Coturnix coturnix</i>	Phasianidae		
Double-banded Courser	<i>Rhinoptilus africanus</i>	Glareolidae		
Dusky Sunbird	<i>Cinnyris fuscus</i>	Nectariniidae		
Eastern Clapper Lark	<i>Mirafrasi fasciolata</i>	Alaudidae		
Fairy Flycatcher	<i>Stenostira scita</i>	Muscicapidae		
Familiar Chat	<i>Oenanthe familiaris</i>	Muscicapidae		
Fawn-colored Lark	<i>Calendulauda africanoides</i>	Alaudidae		
Greater Kestrel	<i>Falco rupicoloides</i>	Falconidae		
Grey-backed Cisticola	<i>Cisticola subruficapilla</i>	Cisticolidae		
Grey-backed Sparrow-lark	<i>Eremopterix verticalis</i>	Alaudidae		
Hadada Ibis	<i>Bostrychia hagedash</i>	Threskiornithidae		
Hamerkop	<i>Scopus umbretta</i>	Scopidae	NT	LC
Jackal Buzzard	<i>Buteo rufofuscus</i>	Accipitridae		
Karoo Chat	<i>Emarginata schlegelii</i>	Muscicapidae		
Karoo Eremomela	<i>Eremomela gregalis</i>	Cisticolidae		
Karoo Korhaan	<i>Eupodotis vigorsii</i>	Otididae	NT	LC
Karoo Long-billed Lark	<i>Certhilauda subcoronata</i>	Alaudidae		
Karoo Prinia	<i>Prinia maculosa</i>	Cisticolidae		
Karoo Scrub Robin	<i>Cercotrichas coryphoeus</i>	Muscicapidae		
Kori Bustard	<i>Ardeotis kori</i>	Otididae	NT	NT

Sandgat Prospecting Right

Lanner Falcon	<i>Falco biarmicus</i>			
Lappet-faced Vulture	<i>Torgos tracheliotos</i>	Accipitridae	CR	EN
Large Rock Martin	<i>Ptyonoprogne fuligula</i>	Hirundinidae		
Large-billed Lark	<i>Galerida magirostris</i>	Alaudidae		
Lark-like Bunting	<i>Emberiza impetuani</i>	Emberizidae		
Laughing Dove	<i>Spilopelia senegalensis</i>	Columbidae		
Layard's Warbler	<i>Curruca layardi</i>	Sylviidae		
Ludwig's Bustard	<i>Neotis ludwigii</i>	Otididae	EN	EN
Marsh Owl	<i>Asio capensis</i>	Strigidae	NT	LC
Martial Eagle	<i>Polemaetus bellicosus</i>	Accipitridae	EN	EN
Mountain Wheatear	<i>Myrmecocichla monticola</i>	Muscicapidae		
Namaqua Dove	<i>Oena capensis</i>	Columbidae		
Namaqua Sandgrouse	<i>Pterocles namaqua</i>	Pteroclididae		
Northern Black Korhaan	<i>Afrotis afraoides</i>	Otididae		
Pale Chanting Goshawk	<i>Melierax canorus</i>	Accipitridae		
Pied Crow	<i>Corvus albus</i>	Corvidae		
Pink-billed Lark	<i>Spizocorys conirostris</i>	Alaudidae		
Pirit Batis	<i>Batis pririt</i>	Platysteiridae		
Red Lark	<i>Calendulauda burra</i>	Alaudidae	VU	VU
Red-billed Quelea	<i>Quelea quelea</i>	Ploceidae		
Red-billed Teal	<i>Anas erythrorhyncha</i>	Anatidae	NT	LC
Red-capped Lark	<i>Calandrella cinerea</i>	Alaudidae		
Red-headed Finch	<i>Amadina erythrocephala</i>	Estrinidae		
Ring-necked Dove	<i>Streptopelia capicola</i>	Columbidae		
Rufous-eared Warbler	<i>Malcorus pectoralis</i>	Cisticolidae		
Sabota Lark	<i>Calendulauda sabota</i>	Alaudidae		
Scaly-feathered Weaver	<i>Sporopipes squamifrons</i>	Ploceidae		
Sclater's Lark	<i>Spizocorys sclateri</i>	Alaudidae	NT	NT
Secretarybird	<i>Sagittarius serpentarius</i>	Sagittariidae	VU	EN
Sickle-winged Chat	<i>Emarginata sinuata</i>	Muscicapidae		
Sociable Weaver	<i>Philetairus socius</i>	Ploceidae		
Southern Black Korhaan	<i>Afrotis afra</i>	Otididae	VU	VU
Southern Fiscal	<i>Lanius collaris</i>	Laniidae		
Southern Masked Weaver	<i>Ploceus velatus</i>	Ploceidae		
Speckled Pigeon	<i>Columba guinea</i>	Columbidae		
Spike-heeled Lark	<i>Chersomanes albofasciata</i>	Alaudidae		
Spotted Eagle Owl	<i>Bubo africanus</i>	Strigidae		
Spotted Thick-knee	<i>Burhinus capensis</i>	Burhinidae		
Stark's Lark	<i>Spizocorys starki</i>	Alaudidae		

Sandgat Prospecting Right

Tractrac Chat	<i>Emarginata tractrac</i>	Muscicapidae		
Verreaux's Eagle	<i>Aquila verreauxii</i>	Accipitridae	VU	VU
White-backed Mousebird	<i>Colius colius</i>	Coliidae		
White-backed Vulture	<i>Gyps africanus</i>	Accipitridae	CR	CR
White-browed Sparrow-weaver	<i>Plocepasser mahali</i>	Ploceidae		
White-throated Canary	<i>Crithagra albogularis</i>	Fringillidae		
Yellow Canary	<i>Crithagra flaviventris</i>	Fringillidae		
Yellow-bellied Eremomela	<i>Eremomela icteropygialis</i>	Cisticolidae		

7.5 Appendix F: Specialist Declaration of Independence

I, Grietjie Stander, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Grietjie Stander

Terrestrial Ecologist

The Biodiversity Company

May 2026

I, Carami Burger, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Carami Burger

Terrestrial Ecologist

The Biodiversity Company

May 2026

I, Wicus Cronjé, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Wicus Cronjé

Avifauna Specialist

The Biodiversity Company

May 2026

I, Lindi Steyn, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Dr Lindi Steyn

Avifauna Specialist

The Biodiversity Company

May 2026


7.6 Appendix G: Specialist CVs

Grietjie STANDER

Cert Sci Nat 162039

+27 64 901 1724

grietjie@thebiodiversitycompany.com



PROFILE SUMMARY

Environmental and ecological specialist with more than three years of consulting experience within South Africa and internationally. Specialist expertise as a terrestrial ecologist and project manager in various sectors including mining, engineering, renewable energy, and private sector developments. Experienced in delivering field surveys, technical reports and specialist guidance for compliance with in-country legislative requirements and international lender standards. Registered Cert Sci Nat with the South African Council for Natural Scientific Professions.

PERSONAL INFO

Nationality: South African
Date of birth: 14 September 1993

EXPERIENCE


Environmental Impact Assessments (EIA)
Environmental Management Programmes (EMP)
Project Management
Terrestrial Biodiversity Assessments

SKILLS

- ✓ Terrestrial Biodiversity, Fauna and Flora (Ecology) Assessments
- ✓ GIS
- ✓ Wetland delineation
- ✓ Rehabilitation
- ✓ Monitoring & Management Plans

LANGUAGES

English – Proficient
Afrikaans – Proficient



Signed: Grietjie Stander

ACADEMIC QUALIFICATIONS

University of Limpopo (2023): MAGISTER SCIENTIAE (MSc) – Zoology:
Thesis title: *The effect of climate change on the breeding success of three African hornbill species*

Bhejane Nature Training (2017): FGASA (NQF2)
Terrestrial and Marine Guide Training

North West University (2015): BACCALAREUS SCIENTIAE (BSc Hons) – Environmental Sciences (Aquatic health):
Research project title: *Research project: Fish diversity and health assessment of Clarias gariepinus from the Makuleke Wetlands in the Kruger National Park*

North West University (2017): BACCALAREUS SCIENTIAE (BSc) – Environmental Sciences:
Majors: Zoology and Geography

PROFESSIONAL EXPERIENCE

Sep 2023 – Present	The Biodiversity Company Terrestrial Ecologist
Aug 2022 – Aug 2023	Milnex Environmental Consultants CC Ecologist and Consultant (Water Use Licensing)
Mar 2022 – Aug 2022	Mogalakwena Research Centre Assistant Research Manager
Jan 2019 – Aug 2022	Mogalakwena Research Centre Research Assistant

INTERNATIONAL EXPERIENCE

South Africa, Angola, Mali, Mauritius, Mozambique

Wicus CRONJE

SACNASP Pending

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PROFILE SUMMARY

I am an Avifaunal Intern at The Biodiversity Company, conducting bird surveys and writing associated reports for different developments in the energy sector. Prior ecological surveys in different provinces gave me a deeper insight into South Africa's biodiversity. My passion extends to socio-ecological systems, as I am a firm believer of conservation as a multidisciplinary field, with environmental education and nature-based solutions personally being key components of this philosophy.

PERSONAL INFO

Nationality: South African

Date of birth: 4 August 2000

EXPERIENCE

Avifaunal Field Surveys

Report Writing

International Collaboration

Environmental Education

Vacation Work (table grape farms)

SKILLS

- ✓ Avifaunal Assessments
- ✓ Geographic Information Systems (QGIS)
- ✓ Cross-cultural exchange
- ✓ Public Speaking
- ✓ Networking

LANGUAGES

Afrikaans - Native

English – Proficient

isiXhosa - Basic

Signed: Wicus Cronje

ACADEMIC QUALIFICATIONS

Stellenbosch University, Stellenbosch, South Africa
(2021-2024): BSc in Conservation Ecology

Academy for Environmental Leadership, Upington,
South Africa (2020): Higher Certificate in
Conservation Ecology

PROFESSIONAL EXPERIENCE

Nov 2025 – Present **The Biodiversity Company**
Avifaunal Intern

Jun 2024 – Aug 2025 **Ripples of Hope International Fellowship**
Fellow 2024/25

Apr 2025 **Birds and Bats Unlimited**
Avifaunal Observer

Jan – Mar 2025 **Nature's Valley Trust NPC**
Intern

INTERNATIONAL EXPERIENCE

Ripples of Hope International Fellowship – immersion to
the United States of America



Carami Burger



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PROFILE SUMMARY

Environmental and ecological specialist with 7 years' consulting experience and international exposure across multiple African countries. Specialist in project exploration, mining, engineering, hydropower, renewable energy, infrastructure, and private sector developments. Experienced in terrestrial ecology, wetland resources, rehabilitation, environmental compliance, and monitoring. Skilled in managing multi-disciplinary projects and providing technical guidance for compliance with legislative and international lender standards. Registered Pr Sci Nat with the South African Council for Natural Scientific Professions.

PERSONAL INFO

Nationality: South African

Date of birth: 25 June 1996

EXPERIENCE

Environmental and basic impact assessments
Terrestrial and wetland ecological studies
Critical habitat evaluations
Environmental management and rehabilitation planning
Invasive species and search and rescue plans
Environmental compliance audits
Water use license applications
Dust fallout and water quality monitoring

SKILLS

- ✓ Environmental Assessment
- ✓ Ecology
- ✓ Habitat Assessment
- ✓ Rehabilitation
- ✓ Compliance Auditing
- ✓ Water Use Licensing
- ✓ Monitoring & Management Plans

C Burger

Signed: Carami Burger

ACADEMIC QUALIFICATIONS

North-West University (2017): Baccalaureus Scientiae Honoribus (Hons) – Ecological Interactions and Ecosystem Resilience (Cum Laude)
Mini-Dissertation on ecological information in Environmental Impact Assessments (EIA) at Mooi River Mall

North-West University (2016): Baccalaureus Scientiae in Natural and Environmental Sciences
Majors: Botany and Zoology

PROFESSIONAL EXPERIENCE

May 2022 – Present **The Biodiversity Company**
Ecologist

June 2019 – April 2022 **EP3 Environmental**
Senior Consultant and Ecologist

November 2018 – June 2019 **Scientific Aquatic Services (SAS)**
Intern

INTERNATIONAL EXPERIENCE

South Africa, Mozambique, Zambia, Angola, Sierra Leone, Botswana.

LANGUAGES

English – Proficient

Afrikaans – Proficient

Dr Lindi Steyn

Pr Sci Nat 119992

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PROFILE SUMMARY

Environmental and Ecological Specialist with eight years of consulting experience, including work on international projects. Proven proficiency in supporting initiatives within exploration, mining, engineering, hydropower, renewable energy, and private sector development sectors. Adept at providing expert advice, technical assistance, and facilitation to achieve compliance with local regulations and international tender requirements. Registered as a Professional Natural Scientist (Pr Sci Nat) with the South African Council for Natural Scientific Professions.

PERSONAL INFO

Nationality: South African

Date of birth: 25 May 1988

EXPERIENCE

Tender reporting requirements

Environmental, Social and Health Impact Assessments (ESHIA)

Environmental Management Programmes (EMP)

Ecology

SKILLS

- ✓ Biodiversity Assessment
- ✓ Avifauna Assessment
- ✓ Monitoring & Management Plans
- ✓ GIS spatial analysis and digital cartography
- ✓ Critical Habitat Assessments

LANGUAGES

English – Proficient

Afrikaans – Proficient

INTERNATIONAL EXPERIENCE

South Africa, Swaziland, Zimbabwe, Lesotho

Signed: Lindi Steyn

ACADEMIC QUALIFICATIONS

University of Johannesburg, Johannesburg, South Africa (2018): PHILOSOPHIAE DOCTOR (PhD) – Biodiversity and Conservation

Title: *The effect of DDT on the histology, reproductive success and overall health of the House Sparrow in designated areas.*

University of Johannesburg, Johannesburg, South Africa (2013): MAGISTER SCIENTIAE (MSc) – Biodiversity and Conservation

Title: Comparative determination of the numbers of four garden bird species, the House Sparrow, *Passer domesticus*, the Cape Glossy Starling, *Lamprolaima nitens*, the Cape Turtle Dove, *Streptopelia capicola* and the Laughing Dove, *Streptopelia senegalensis* in the Johannesburg and Vaalwater areas with study into possible causes of expected declines.

University of Johannesburg, Johannesburg, South Africa (2011): BACCALAUREUS SCIENTIAE CUM HONORIBUS (Hons) – Zoology

University of Johannesburg, Johannesburg, South Africa (2010): BACCALAUREUS SCIENTIAE IN NATURAL AND ENVIRONMENTAL SCIENCES. Majors: Zoology and Botany.

Damelin, Bramley, Johannesburg: National Certificate in Field Guiding (Lodge Management) (2007)

Damelin, Bramley, Johannesburg: Field guiding FGASA level 1 certificate (2007)

Damelin, Bramley, Johannesburg: Ecotraining- Karongwe & Selati (2007)

PROFESSIONAL EXPERIENCE

May 2018 – Present **The Biodiversity Company**
Ecologist

Jan 2012 – July 2018 **University of Johannesburg**
Laboratory assistant, Demonstrator, Tutor

CURRICULUM VITAE: Lindi Steyn

PUBLICATIONS

Steyn, L., Bouwman, H., Maina, J.N. (2018). Associations between DDT and egg parameters of the House Sparrow *Passer domesticus* from the Thohoyandou area of South Africa, Chemosphere.

Steyn, L., Bouwman, H., Maina, J.N. (2018). The effect of DDT and its metabolites on the structure of the shells of the eggs of the House Sparrow, *Passer domesticus*: A morphometric study. 7th International Toxicology Symposium in Africa.

Steyn, L., Bouwman, H., Maina, A.W, Hoffman, J., Maina, J.N. (2018). Bone density and asymmetry are not related to DDT in House Sparrows: insights from micro-focus X-ray computed tomography. Chemosphere.

Steyn, L., Maina, J.N. (2016). Comparison of the numbers of three species of birds in an urban- and a rural area of South Africa and possible relationship to the numbers of free (surface) macrophages in the respiratory systems. Journal of Ornithology

Willoughby, B., Steyn, L., Maina, J.N. (2015). X-ray microcomputed tomography study of the microstructure and the morphometry of the shell of the ostrich, *Struthio camerus*, egg. Anatomical record

Steyn, L., Maina, J.N. (2013). Die verwagte afname van die getalle van vier voël spesie, die Huismossie, Kleinglansspreeu, Gewone Tortelduif en die Rooiborsduifie in Gauteng en Limpopo provinsies en moontelike oorsake van die dalings. Die Suid-Afrikaanse akademie vir wetenskap en kuns afdeling biologiese wetenskappe, Pretoria.

CURRICULUM VITAE: Lindi Steyn