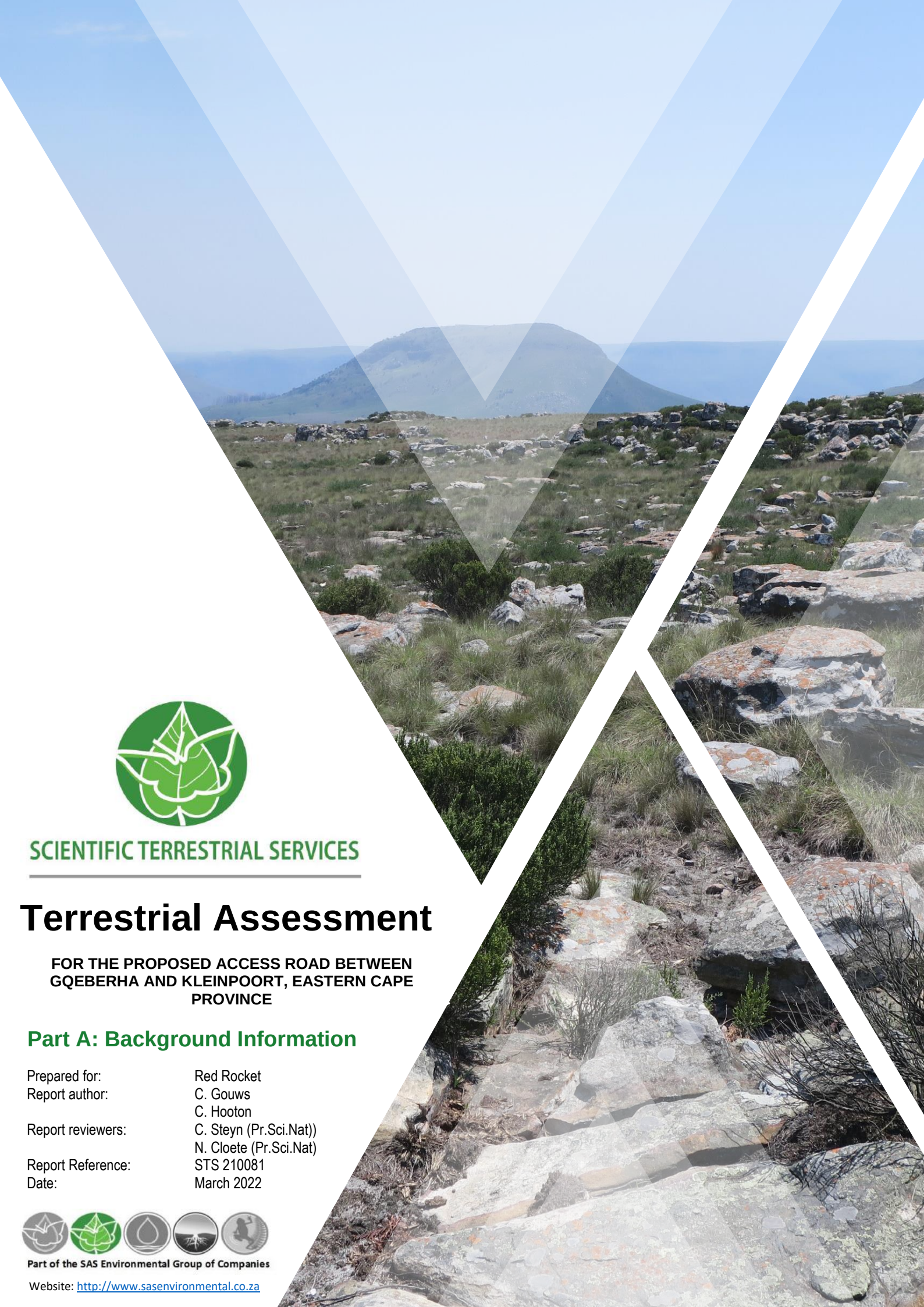

SCIENTIFIC TERRESTRIAL SERVICES

Terrestrial Assessment

FOR THE PROPOSED ACCESS ROAD BETWEEN GQEBERHA AND KLEINPOORT, EASTERN CAPE PROVINCE

Part A: Background Information

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EXECUTIVE SUMMARY

Scientific Terrestrial Services CC (STS) was appointed by Red Rocket (Pty) Ltd to conduct a terrestrial biodiversity assessment as part of the Environmental Authorisation (EA) process for the proposed overhead powerline (OHPL) between Qqeberha and Kleinpoort, from Grassridge substation to Wolf substation in the Eastern Cape province.

Conservation Summary (Desktop database research)

The Investigation area is situated within the Albany Thicket Biome. The proposed OHPL powerline occurs in four vegetation types, namely the located within the Albany Alluvial Thicket, Grassridge Bontveld, Sundays Arid Thicket and Sundays Valley Thicket (Mucina and Rutherford, 2006). Except for the Albany Alluvial Thicket which is currently classified as an Endangered (**EN**) and Sundays Arid Thicket (Vulnerable; **VU**) the other vegetation types are all of Least Concern (**LC**) when considering their conservation status.

For the **Terrestrial Biodiversity Theme** (Online Web Based National Environmental Screening Tool), the investigation area is considered to have a *High Sensitivity*. The triggered sensitivity features include Critical Biodiversity Areas (CBA) and an Ecological Support Areas (ESA). For the **Animal Species Theme** the investigation area largely fall in a *Low Sensitivity* area, with small, scattered sections mapped as *Medium Sensitivity* areas. The medium sensitivities were triggered by the potential occurrence of the avifauna species *Sagittarius serpentarius* (Secretary bird) (EN). For the **Plant Species Theme**, the investigation area is within a *Medium Sensitivity* area with scattered section occurring in a Low sensitivity region. However, the Screening Tool identified the plant species theme as a High Sensitivity due to the presence of high and medium SCC.

The investigation area is further located in the Albany Centre of Endemism, this region is therefore associated with endemic species found within the limited extent of the Eastern Cape. (**Figure 14**).

Habitat Summary (ground-truthed results)

Based on the results of the field investigation of February 2022 by STS, nine broad habitat units were distinguished for the investigation area:

- **Sundays Arid Thicket:**
  - Low Growing Shrubland;
  - Scattered Bush Clumps; and
  - Tree Dominated Shrublands.
- **Sundays Valley Thicket**;
- **Grassridge Bonteveld**:
  - Calcareous Grasslands; and
  - Thicket Patches.
- **Transformed Areas**, encompassing roads, fence lines, areas transformed by anthropogenic activities, areas of significant AIP (Alien and Invasive Plant) infestation, as well as artificial impoundments; and
- **Freshwater Habitat**:
  - Other Drainage Features (preferential flow paths); and
  - Watercourse Habitat (including various river systems, their associated tributaries, ephemeral drainage lines and episodic drainage lines).

CONSERVATION SIGNIFICANCE OF THE STUDY AREA

The majority of the OHPL extent is within a very high sensitivity area according to the Terrestrial Biodiversity This very high sensitivity is due to the presence of CBA1, CBA2, ESA 1 and FEPA catchment areas The presence of Endangered vegetations type (Albany Alluvial Thicket). After ground truthing the presence of CBA 1, CBA 2 and an ESA 1 was confirmed. The Scattered Bush Clumps Sub-Unit was regarded as a CBA 2 and the Sundays Valley Thicket as a CBA 1 and ESA 1.

Therefore, the impacts of the OHPL will impact on a CBA 1, based on the suggestion from the ECBCP the following is suggested: Maintain in a natural state (or near-natural state if this is the current condition of the site) that secures the retention of biodiversity pattern and ecological processes. For areas classified as CBA1, the following objectives must apply; Ecosystem and species must remain intact and undisturbed, since these areas demonstrate high irreplaceability, if disturbed or lost, biodiversity targets will not be met and Important: these biodiversity features are at, or beyond, their limits of acceptable change. Therefore, If land use activities are unavoidable in these areas, and depending on expert opinion of the condition of the site, a Biodiversity Offset must be designed and implemented.

The activities have also been determined to impact an ESA 1. This relates mostly to the Sundays Valley Thicket as it is recognised as an important ecological corridor by provincial conservation datasets. Based on the ECBCP activities should maintain ecological function within the localised and broader landscape. A functional state in this context means that the area must be maintained in a semi-natural state such that ecological function and ecosystem services are maintained. For areas classified as ESA1, the following objectives apply; These areas are not required to meet biodiversity targets, but they still perform essential roles in terms of connectivity, ecosystem service delivery and climate change resilience, these systems may vary in condition and maintaining function is the main objective, therefore ecosystems still in natural, near natural state should be maintained and ecosystems that are moderately disturbed/degraded should be restored. Therefore, in this case with the Sundays Valley Thicket have a high abundance of AIPs and transformed areas restoration is possible

SPECIES OF CONSERVATION CONCERN (SCC)

The Screening Tool identified the entire extent of the Study Area to be in a high sensitivity area for the Plant Species Theme (i.e., model-derived suitable habitat areas for threatened and/or rare species) with majority of the area within a medium sensitivity area. The animal species theme was identified as a combination of high and medium sensitivity areas, the majority of the line being in medium sensitivity areas and only the easter portion being associated with a high sensitivity area. The high sensitivity for the Plant Species Theme was confirmed for the Sundays Valley Thicket Habitat Unit and Thicket Patches Sub-Unit whilst the medium and high sensitivity theme was confirmed for the animals theme.

The study area was associated with a high diversity of floral SCC, sometimes occurring in high abundances (e.g*., Encephalartos* sp.), and distributed within an isolated region limited within the Sundays Valley Thicket Habitat Unit. Two floral SCCs was confirmed on site and several other SCC have a medium-high POC. *Sensitive Species 1268* (**EN***)* and *Strelitzia junce* (**VU**) is present on site. None of the faunal species listed by the screening tool were directly observed, however it is possible that they may make use of the associated habitats, notably in the eastern extent of the powerline.

CONCLUDING REMARKS

The data gathered during the site visit indicate that the from a floral perspective the Transformed Habitat Unit is of **Low Sensitivity**, the Low Growing Shrubland, Tree Dominated Shrublands, Calcareous Grasslands and Other Drainage Features are of **Moderately Low Sensitivity**, with the Thicket Patches as **Intermediate Sensitivity**, and Watercourse, Scattered Bush Clumps and Sundays Valley Thicket is of **Moderately High Sensitivity.**

The findings of the assessment revealed that the vegetation communities within the Sunday Valley Thicket Habitat Unit is floristically diverse, harbours numerous floral SCC, and sustain important ecological processes in the larger landscape. Impacts to the vegetation and species associated with the survey area can be kept to a minimum and can stay localised; however, this will require adherence to the mitigation measures and protocols as presented in this report (refer to Part B of the report series). Furthermore, of great concern is the potential for AIP spread resulting from the activities associated with the access road, as well as impacts to floral SCCs if recommended protocols and mitigation measures as presented in Part B of this report series are not adhered to.

From a faunal perspective, the Sundays Arid Thicket and the Sundays Valley Thicket are of **Intermediate Sensitivity**, the Grassridge Bonteveld and Freshwater habitats are of **Moderately High Sensitivity** and the Transformed Habitat is of **Low Sensitivity**.

The proposed OHPL proposed powerline will inevitably impact the terrestrial ecology within the footprint areas as a result of vegetation clearance and regular disturbance during operational phase. Much of the proposed expansion will occur within habitat that is either already transformed, or which is currently in poor conditions with floral communities notably degraded. Within these areas, the expansion activities are expected to have minimal impacts to the receiving environment and the species therein; instead, with mitigation measures implemented, the impacts can be adequately minimised to remain site-specific to local in extent. Some concerns include the presence of Sensitive Species within Thicket Patches Habitat Unit.

Impact Statement

The proposed project could further impact on the floral habitat and diversity as well as floral SCC through fragmentation of habitat units with increased biodiversity importance and sensitivity (specific reference is made to ongoing disturbance and transformation of the ESA 1 and CBA 1 and 2 areas).

The abundance of **Opuntia ficus-indica* and **Acacia Cyclops* within the majority of the Study Area, if not cleared and controlled, will continue to spread and displace floral communities within or outside of the proposed impact area. AIP spread can potentially become severe if such species are not monitored and managed, especially along linear developments that typically serve as a corridor for spread. These species can potentially spread to adjacent natural areas, thus impacting on the indigenous biodiversity of the region.

Notable impacts that are likely to affect the floral and faunal habitat integrity, species diversity and SCC associated with the OHPL project, are listed below:

- Placement of infrastructure within floral and faunal SCC habitat;
- Destruction, removal or harvesting of floral SCC during construction and operational activities;
- Faunal SCC being injured or killed during construction and operational phase due to collisions with equipment and / or human wildlife conflict;
- Potentially poorly implemented and monitored rescue and relocation of SCC that will be affected by the proposed powerline installation, leading to unsuccessful rescue efforts and loss of SCC individuals;
- Continued footprint creep resulting in increasingly fragmented habitat;
- Increase risk of erosion - resulting in loss of soils, the down-slope sedimentation of habitat and the consequent loss of habitat beyond the planned footprint; and
- AIP proliferation and woody encroachment into natural vegetation, displacing indigenous flora and altering favourable habitat conditions for the establishment of indigenous species.

It is the opinion of the ecologists that this study provides the relevant information required to implement Integrated Environmental Management (IEM) and to ensure that the best long-term use of the ecological resources in the Study Area will be made in support of the principle of sustainable development

DOCUMENT GUIDE

The table below provides a guide to the reporting of biodiversity impacts as they relate to 1) Government Notice No. 320 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on **Terrestrial Biodiversity** as published in Government Gazette 43110 dated 20 June 2020, and 2) Government Notice No. 1150 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on **Terrestrial Plant and Animal Species** as published in Government Gazette 43855 dated 30 June 2020.

No.	SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS	Section in report/Notes
Theme-Specific Requirements as per Government Notice No. 320 Terrestrial Biodiversity Theme – Very High Sensitivity Rating as per Screening Tool Output		
2	**Terrestrial Biodiversity Specialist Assessment**	
2.1	The assessment must be prepared by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with expertise in the field of terrestrial biodiversity.	**Part A – C:** Cover Page **Part A:** Appendix E
2.2	The assessment must be undertaken on the preferred site and within the proposed development footprint.	**Part A**: Section 1
2.3	**The assessment must provide a baseline description of the site which includes, as a minimum, the following aspects:**	
2.3.1	A description of the ecological drivers or processes of the system and how the proposed development will impact these;	**Part B**: Section 3 (flora) **Part C:** Section 3 (fauna)
2.3.2	Ecological functioning and ecological processes (e.g., fire, migration, pollination, etc.) that operate within the preferred site;	**Part B**: Section 3 (flora) **Part C:** Section 3 (fauna)
2.3.3	The ecological corridors that the proposed development would impede including migration and movement of flora and fauna;	**Part A:** Section 3 (desktop analysis) **Part B**: Section 3 (flora) **Part C:** Section 3 (fauna)
2.3.4	The description of any significant terrestrial landscape features (including rare or important flora-faunal associations, presence of Strategic Water Source Areas (SWSAs) or Freshwater Ecosystem Priority Area (FEPA) sub catchments;	**Part A:** Section 3 (desktop analysis) **Part B:** Section 3.2 – 3.2.5 (flora) **Part C:** Section 3.2 – 3.5 (fauna) **For descriptions on the presence of FEPAs, please refer to the Freshwater Biodiversity Assessment (FEN 20-2155, 2022)*
2.3.5	A description of terrestrial biodiversity and ecosystems on the preferred site, including: a) main vegetation types; b) threatened ecosystems, including listed ecosystems as well as locally important habitat types identified; c) ecological connectivity, habitat fragmentation, ecological processes and fine scale habitats; and d) species, distribution, important habitats (e.g. feeding grounds, nesting sites, etc.) and movement patterns identified;	**Part A**: Section 3 (desktop analysis) **Part B**: Section 3 (flora) **Part C:** Section 3 (fauna)
2.3.6	The assessment must identify any alternative development footprints within the preferred site which would be of a "low" sensitivity as identified by the screening tool and verified through the site sensitivity verification; and	Not Applicable.
2.3.7	**The assessment must be based on the results of a site inspection undertaken on the preferred site and must identify:**	
2.3.7.1	Terrestrial Critical Biodiversity Areas (CBAs), including: *a) the reasons why an area has been identified as a CBA;*	**Part A**: Section 3 (desktop analysis)

No.	SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS	Section in report/Notes
	b) an indication of whether or not the proposed development is consistent with maintaining the CBA in a natural or near natural state or in achieving the goal of rehabilitation; *c) the impact on species composition and structure of vegetation with an indication of the extent of clearing activities in proportion to the remaining extent of the ecosystem type(s);* *d) the impact on ecosystem threat status;* *e) the impact on explicit subtypes in the vegetation;* *f) the impact on overall species and ecosystem diversity of the site; and* g) *the impact on any changes to threat status of populations of species of conservation concern in the CBA;*	**Part B**: Section 3.2, 3.2.5 **Part C:** Section 3, 4 & 5
2.3.7.2	Terrestrial Ecological Support Areas (ESAs), including: *a) the impact on the ecological processes that operate within or across the site;* *b) the extent the proposed development will impact on the functionality of the ESA; and* c) *loss of ecological connectivity (on site, and in relation to the broader landscape) due to the degradation and severing of ecological corridors or introducing barriers that impede migration and movement of flora and fauna;*	
2.3.7.3	Protected areas as defined by the National Environmental Management: Protected Areas Act, 2004 including- *a) an opinion on whether the proposed development aligns with the objectives or purpose of the protected area and the zoning as per the protected area management plan;*	**Part A**: Section 3 (desktop analysis) However, not applicable as no protected areas or areas of conservation concern are within the footprint of the proposed project,
2.3.7.4	Priority areas for protected area expansion, including- *a) the way in which in which the proposed development will compromise or contribute to the expansion of the protected area network;*	**Part A**: Section 3 (desktop analysis)
2.3.7.5	SWSAs including: *a) the impact(s) on the terrestrial habitat of a SWSA; and* b) *the impacts of the proposed development on the SWSA water quality and quantity (e.g. describing potential increased runoff leading to increased sediment load in water courses);*	Not Applicable to this report
2.3.7.6	FEPA sub catchments, including- *a) the impacts of the proposed development on habitat condition and species in the FEPA sub catchment;*	Not Applicable to this report
2.3.7.7	Indigenous forests, including: *a) impact on the ecological integrity of the forest; and* b) *percentage of natural or near natural indigenous forest area lost and a statement on the implications in relation to the remaining areas.*	Not Applicable to this report
2.4	**The findings of the assessment must be written up in a Terrestrial Biodiversity Specialist Assessment Report.**	
	Part B: Results of the **Floral Assessment** as well as conclusions on Terrestrial Biodiversity as it relates to vegetation communities. **Part C:** Results of the **Faunal Assessment** as well as conclusions on Terrestrial Biodiversity as it relates to faunal communities.	
3	**Terrestrial Biodiversity Specialist Assessment Report**	
3.1	**The Terrestrial Biodiversity Specialist Assessment Report must contain, as a minimum, the following information:**	
3.1.1	Contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	**Part A:** Appendix E
3.1.2	A signed statement of independence by the specialist;	**Part A:** Appendix E

No.	SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS	Section in report/Notes
3.1.3	A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	**Part B:** Section 2-2.3 (flora) **Part C:** Section 1.3 (fauna)
3.1.4	A description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modelling used, where relevant;	**Part A**: Appendix C **Part B:** Section 2 (flora) **Part B:** Appendix A (flora) **Part C:** Section 2 (fauna) **Part C**: Appendix A (fauna)
3.1.5	A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;	**Part B:** Section 1.3 (flora) **Part C:** Section 1.3 (fauna)
3.1.6	A location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant);	**Part B:** Section 4 (flora) **Part C:** Section 4 (fauna)
	Impact Assessment Requirements 3.1.7 Additional environmental impacts expected from the proposed development; 3.1.8 Any direct, indirect and cumulative impacts of the proposed development; 3.1.9 The degree to which impacts and risks can be mitigated; 3.1.10 The degree to which the impacts and risks can be reversed; 3.1.11 The degree to which the impacts and risks can cause loss of irreplaceable resources; 3.1.12 Proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	**Part B:** Section 5 (flora) **Part C:** Section 5 (fauna)
3.1.13	A motivation must be provided if there were development footprints identified as per paragraph 2.3.6 above that were identified as having a "low" terrestrial biodiversity sensitivity and that were not considered appropriate;	**Not Applicable to this report**
3.1.14	A substantiated statement, based on the findings of the specialist assessment, regarding the acceptability, or not, of the proposed development, if it should receive approval or not; and	**Part A:** Executive summary **Part B:** Section 6 (flora) **Part C:** Section 6 (fauna)
3.1.15	Any conditions to which this statement is subjected.	**Part B:** Section 5.1 (flora) **Part C:** Section 5.1 (fauna)
3.2	The findings of the Terrestrial Biodiversity Specialist Assessment must be incorporated into the Basic Assessment Report or the Environmental Impact Assessment Report, including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr where relevant.	This report is submitted to the Environmental Assessment Practitioner (EAP) and applicant and will be appended to the EIA by the EAP in due course as part of the application process
3.3	A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	

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GLOSSARY OF TERMS

Most definitions are based on terms and concepts elaborated by Richardson *et al*. (2011), Hui and Richardson (2017) and Wilson *et al*. (2017), with consideration to their applicability in the South African context, especially South African legislation [notably the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), and the associated Alien and Invasive Species Regulations, 2020].

Alien species (syn. exotic species; non-native species)	A species that is present in a region outside its natural range due to human actions (intentional or accidental) that have enabled it to overcome biogeographic barriers.
Biological diversity or Biodiversity (as per the definition in NEMBA)	The variability among living organisms from all sources including, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems.
Biome - as per Mucina and Rutherford (2006); after Low and Rebelo (1998).	A broad ecological spatial unit representing major life zones of large natural areas – defined mainly by vegetation structure, climate, and major large-scale disturbance factors (such as fires).
Bioregion (as per the definition in NEMBA)	A geographic region which has in terms of section 40(1) been determined as a bioregion for the purposes of this Act;
Critical Biodiversity Area (CBA)	A CBA is an area considered important for the survival of threatened species and includes valuable ecosystems such as wetlands, untransformed vegetation, and ridges.
Corridor	A dispersal route or a physical connection of suitable habitats linking previously unconnected regions.
Disturbance	A temporal change, either regular or irregular (uncertain), in the environmental conditions that can trigger population fluctuations and secondary succession. Disturbance is an important driver of biological invasions.
Ecoregion	An ecoregion is a "recurring pattern of ecosystems associated with characteristic combinations of soil and landform that characterise that region".
Endangered	Organisms in danger of extinction if causal factors continue to operate.
Endemic species	Species that are only found within a pre-defined area. There can therefore be sub-continental (e.g., southern Africa), national (South Africa), provincial, regional, or even within a particular mountain range.
Ecological Support Area (ESA)	An ESA provides connectivity and important ecological processes between CBAs and is therefore important in terms of habitat conservation.
Ground-truth	Ground truth is a term used in various fields to refer to information provided by direct observation (i.e., empirical evidence) as opposed to information provided by inference.
Habitat (as per the definition in NEMBA)	A place where a species or ecological community naturally occurs.
Important Bird and Biodiversity Area (IBA)	The IBA Programme identifies and works to conserve a network of sites critical for the long-term survival of bird species that: are globally threatened, have a restricted range, are restricted to specific biomes/vegetation types or sites that have significant populations.
Indigenous vegetation (as per the definition in NEMA)	Vegetation occurring naturally within a defined area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.
Integrity (ecological)	The integrity of an ecosystem refers to its functional completeness, including its components (species) its patterns (distribution) and its processes.
Invasive species	Alien species that sustain self-replacing populations over several life cycles, produce reproductive offspring, often in very large numbers at considerable

	distances from the parent and/or site of introduction, and have the potential to spread over long distances.
Listed alien species	All alien species that are regulated in South Africa under the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004), Alien and Invasive Species Regulations, 2020.
Least Threatened	Least threatened ecosystems are still largely intact.
Native species (syn. indigenous species)	Species that are found within their natural range where they have evolved without human intervention (intentional or accidental). Also includes species that have expanded their range as a result of human modification of the environment that does not directly impact dispersal (e.g., species are still native if they increase their range as a result of watered gardens but are alien if they increase their range as a result of spread along human-created corridors linking previously separate biogeographic regions).
Red Data listed (RDL) species	According to the Red List of South African plants (http://redlist.sanbi.org/) and the International Union for Conservation of Nature (IUCN), organisms that fall into the Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN), Vulnerable (VU) categories of ecological status.
Species of Conservation Concern (SCC)	The term SCC in the context of this report refers to all RDL and IUCN listed threatened species as well as protected species of relevance to the project.

LIST OF ACRONYMS

AIP	Alien and Invasive Plant
BGIS	Biodiversity Geographic Information Systems
CARA	Conservation of Agricultural Resources Act, 1983 [Act No. 43 of 1983]
CBA	Critical Biodiversity Area
CR	Critically Endangered
DFFE	Department of Forestry, Fisheries and the Environment
EA	Environmental Authorisation
EC	Eastern Cape
ECBCP	The Eastern Cape Biodiversity Conservation Plan
E-GIS	Environmental Geographical Information Systems
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EN	Endangered
ESA	Ecological Support Area
EW	Extinct in the Wild
FEPA	Freshwater Ecosystem Priority Area
GN	Government Notice
Ha	Hectares
IBA	Important Bird and Biodiversity Area
IEA	Integrated Environmental Authorisation
IUCN	International Union for Conservation of Nature
LC	Least Concern
MAP	Mean annual precipitation
MAPE	Mean Annual Potential Evaporation
masl	Meters Above Mean Sea Level
MASMS	Mean Annual Soil Moisture Stress
MAT	Mean Annual Temperature
MFD	Mean Frost Days
MP	Moderately Protected
MR	Mining Right
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act, 1998 [Act No. 107 of 1998]
NEMBA	National Environmental Management: Biodiversity Act, 2004 [Act No. 10 of 2004]
NEMPAA	National Environmental Management: Protected Areas Act [Act No 57 of 2003]
NFA	National Forest Act, 1998 [Act No. 84 of 1998]
NP	Not Protected
NPAES	National Protected Area Expansion Strategy
OHPL	Overhead Powerline
PP	Poorly Protected
QDS	Quarter Degree Squares
RDL	Red Data listed
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
SABAP 2	South African Bird Atlas Project 2
SACAD	South African Conservation Areas Database
SACNASP	Professional member of the South African Council for Natural Scientific Professions
SANBI	South African National Biodiversity Institute

SanParks	South African National Parks
SAPAD	South African Protected Areas Database
SCC	Species of Conservation Concern
STS	Scientific Terrestrial Services
SWSA	Strategic Water Source Areas
VEGMAP	National Vegetation Map Project
VU	Vulnerable

1 INTRODUCTION

Scientific Terrestrial Services CC (STS) was appointed by Red Rocket (Pty) Ltd to conduct a terrestrial biodiversity assessment as part of the Environmental Authorisation (EA) process for the proposed overhead powerline (OHPL) between Qqeberha and Kleinpoort, from Grassridge substation to Wolf substation in the Eastern Cape province. A 100 m buffer (50 metres on either side of the proposed OHPL) to account for edge effects was investigated by the specialists. The proposed OHPL and 100 m buffer will henceforth be collectively referred to as the **"investigation area"** or interchangeably as **"Study Area".**

The purpose of this report (Part A) is to define the biodiversity associated with the investigation area from a desktop conservation database perspective. It is the objective of this desktop assessment to provide detailed information to guide the fieldwork components (discussed in Parts B and C) to ensure that all relevant ecological aspects are considered prior to performing the field assessments. This report is not a standalone report and should be considered together with the outcome of the biodiversity assessments (Part B and C).

1.1 Project Description

An existing 132 kV transmission line runs between the Wolf and Skilpad substations (approximately 46 km long) and Skilpad to Grassridge substations (approximately 44 km long) and is located north of Kariega and West of Kirkwood. The line runs from the Grassridge substation in a general north-westerly direction to the Skilpad- and Wolf substation and is approximately 90 km in length.

Eskom requires that Wolf Wind Farm (RF) (Pty) Ltd, a preferred bidder in the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) Bid Window 5, construct a new Wolf-Skilpad-Grassridge 132 kV transmission line adjacent to the existing line and that the old line be decommissioned in the future. The new transmission line forms part of the works required for connecting the Wolf Wind Farm to the national grid and will prevent potential future capacity issues and failure of the infrastructure. The monopole structures will be at a height of 40 m, and depending on the terrain, the conductors can vary and may go up to 100 m high. This will however only be determined once the lidar survey is complete. Self-supporting monopole structures will be used where required.

There will be two types of disturbance associated with the erection of the monopoles;

- **Temporary disturbance** consisting of the excavation of the foundation and general construction activities; and

- **Permanent disturbance** which is the area covered by the foundation that sticks out above ground.

The pylon structure type to be used for the proposed OHPL requires confirmation still, but it will likely be steel monopole and lattice structures (Figure 1). The new line will be accessed via new tracks under the proposed OHPL. The figure below illustrates the typical design of a steel monopole and steel lattice tower structure.

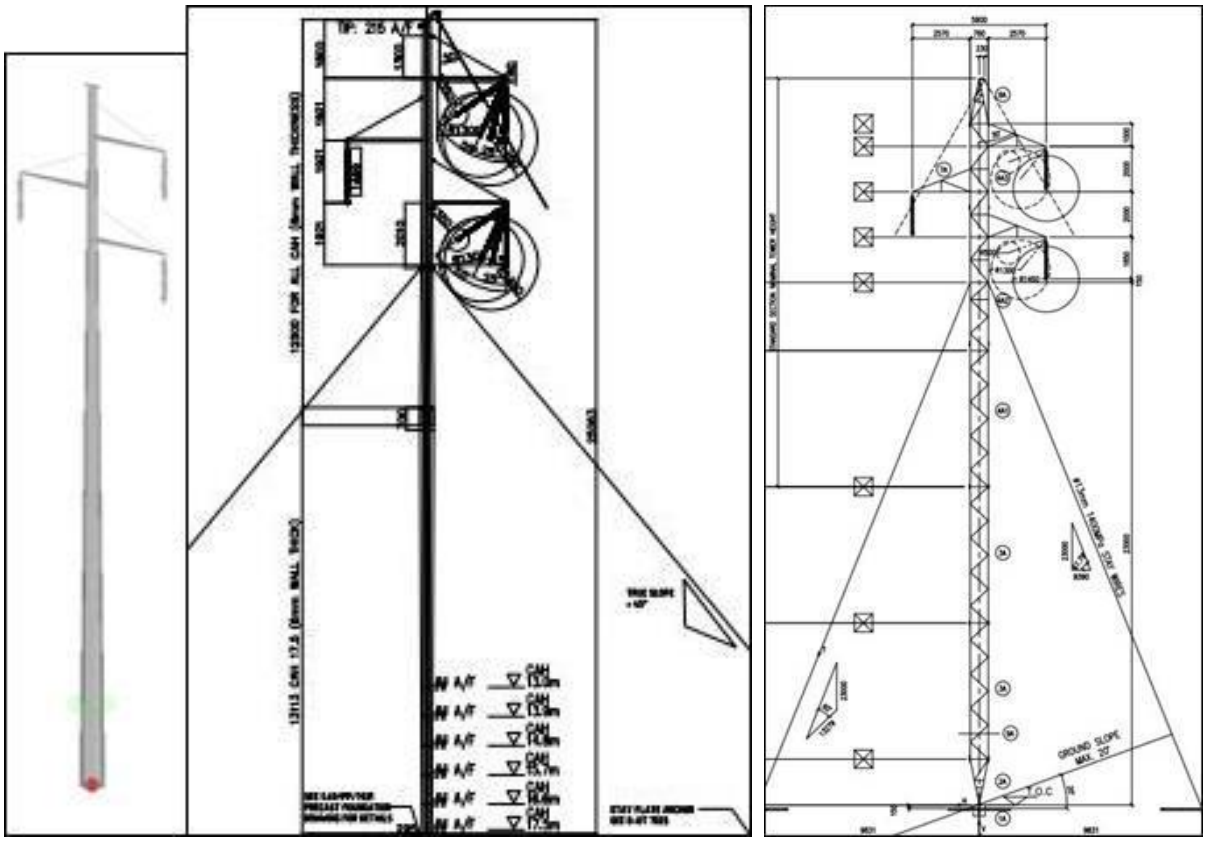

Figure 1: Typical monopole (left) and lattice (right) tower structure.

The extent and layouts of the investigation area are depicted in Figures 2 – 3 below.

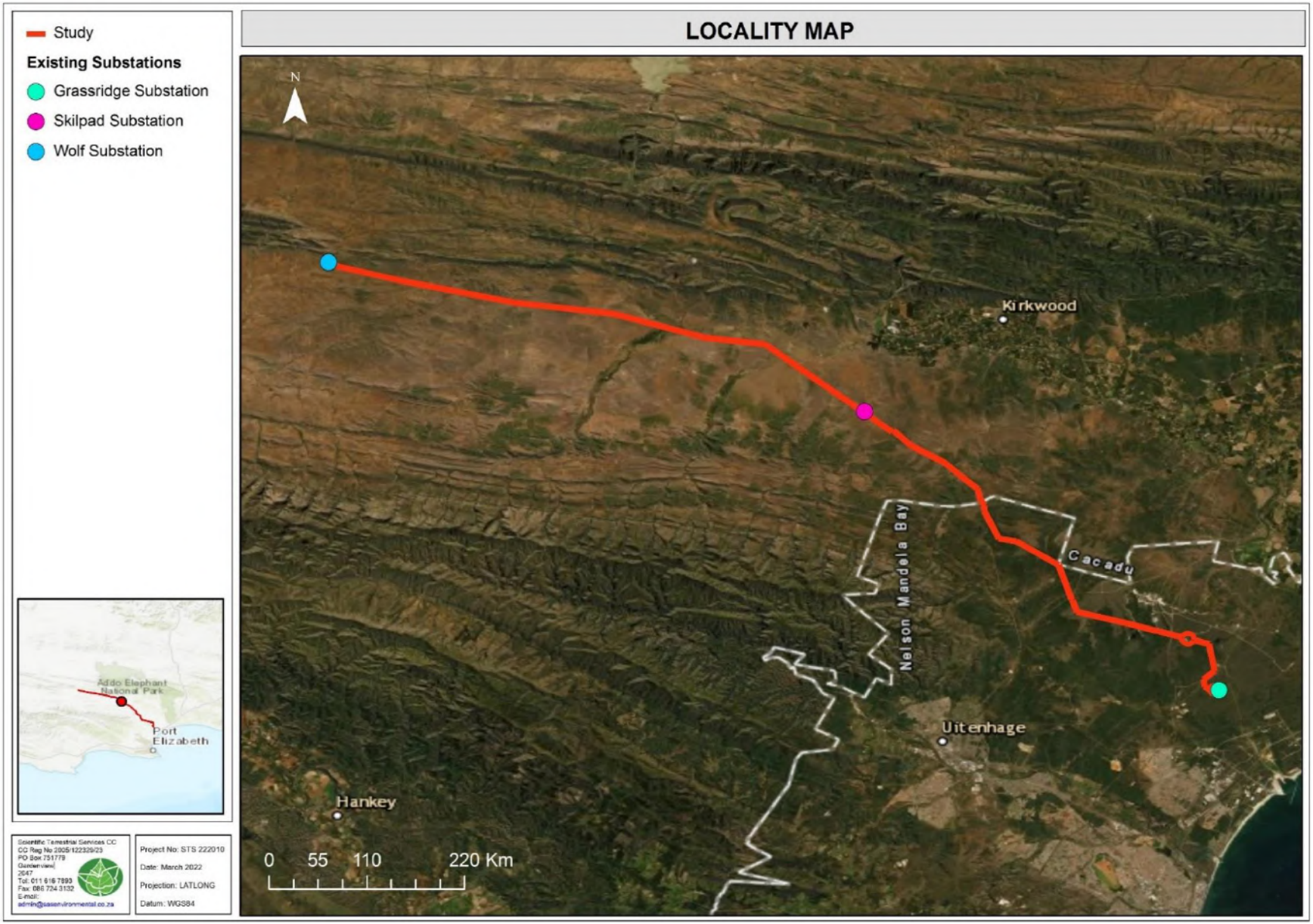

Figure 2: Digital satellite image depicting the investigation area and existing substations in relation to surrounding areas.

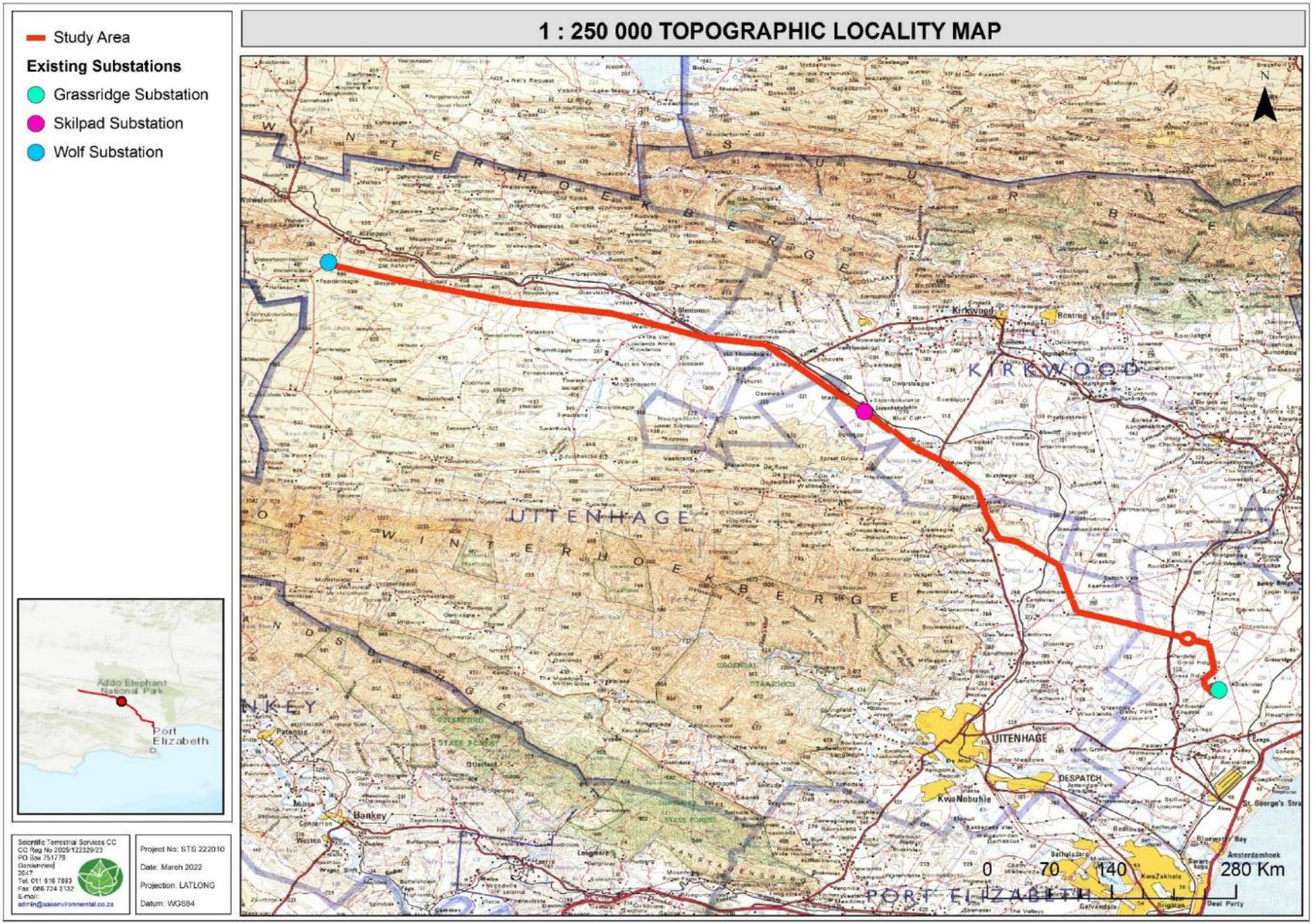

Figure 3: The investigation area and existing substations depicted on a 1:250 000 topographical map in relation to the surrounding area.

1.2 Scope of Work

Specific outcomes in terms of Part A of the report are as follows:

- To compile a desktop assessment with all relevant information as presented by South African National Biodiversity Institute's (SANBI's) Biodiversity Geographic Information Systems (BGIS) website (http://bgis.sanbi.org) and the Environmental Geographical Information Systems (E-GIS) website (https://egis.environment.gov.za/). The desktop assessment aims to gain background information on the physical habitat and potential floral and faunal ecology associated with the investigation area;
- To state the indemnity and terms of use of this report (Appendix A) as well as to provide the details of the specialists who prepared the reports (Appendix E);
- To outline the legislative requirements that were considered for the assessment (Appendix B of this report); and
- To provide the methodologies followed relating to the impact assessment and development of the mitigation measures (Appendix C) that was applied in the floral and faunal assessments (Part B and Part C).

1.3 Assumptions and Limitations

The following assumptions and limitations are applicable to this report (Part A only):

- The biodiversity desktop assessment is confined to the investigation area and does not include detailed results of the adjacent properties, although the sensitivity of surrounding areas has been included on the relevant maps;
- It is important to note that although all data sources used provide useful and often verifiable, high-quality data, the various databases used do not always provide an entirely accurate indication of the actual site characteristics associated with the investigation area at the scale required to inform an environmental process. However, this information is useful as background information to the study and, if desktop results are considered with the outcome of the faunal and floral assessments (Parts B and C); sufficient decision making can take place with regards to the proposed OHPL; and
- The field assessment was undertaken during summer (7th – 11th February 2022, and the 22nd - 23rd March). The field assessment aimed to determine the ecological status of the investigation area and to "ground-truth" the results of the desktop assessment (as presented in Parts B and C).

1.4 Legislative Requirements

The following legislative requirements were considered during the biodiversity assessment and are applicable to Parts A – C:

- The Constitution of the Republic of South Africa, 1996[1];
- The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- Government Notice (GN) No. 320 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity as published in Government Gazette 43110 dated 20 June 2020;
- GN No. 1150 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant and Terrestrial Animal Species as published in Government Gazette 43855 dated 30 June 2021;
- The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA);
- GN No. R.1020: Alien and Invasive Species Regulations, 2020, in Government Gazette 43735 dated 25 September 2020 as it relates to the NEMBA;
- The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA).
- The National Forest Act, 1998 (Act No. 84 of 1998, amended 2001) (NFA);
- National Environmental Management: Protected Areas Act (Act 57 Of 2003) (NEMPAA);
- GN No. 536 List of Protected Tree Species as published in the Government Gazette 41887 dated 7 September 2018 as it relates to the National Forest Act, 1998 (Act No. 84 of 1998); and
- The Cape Nature and Environmental Conservation Ordinance No. 19 of 1974.

The details of each of the above, as they pertain to this study, are provided in Appendix B of this report.

2 ASSESSMENT APPROACH

Maps and digital satellite images were generated prior to the field assessment in order to determine broad habitats, vegetation types and potentially sensitive sites. The biodiversity desktop assessment is confined to the investigation area and does not include the neighbouring and adjacent properties, although the sensitivity of surrounding areas is included

[1] Since 1996, the Constitution has been amended by seventeen amendments acts. The Constitution is formally entitled the 'Constitution of the Republic of South Africa, 1996". It was previously also numbered as if it were an Act of Parliament – Act No. 108 of 1996 – but since the passage of the Citation of Constitutional Laws Act, neither it nor the acts amending it are allocated act numbers.

on the respective maps. Relevant databases and documentation that were considered during the assessment of the investigation area included [2]:

- 2010 National Protected Area Expansion Strategy (NPAES) (Government of South Africa. 2010; DEA & SANBI, 2009), including the below-listed vector datasets:
  - NPAES Focus Areas 2010: National Protected Areas Expansion Strategy: Focus areas for protected area expansion (South African National Parks (SanParks), 2010);
  - NPAES Formal: Polygons of formal protected national parks areas in South Africa (SANParks/SANBI, 2013); and
  - NPAES Protected Areas – Informal: Informal conservation areas in South Africa (SANParks/SANBI, 2012).
- The South African Conservation Areas Database, Quarter 3 (SACAD, 2021)[3];
- The South African Protected Areas Database, Quarter 3 (SAPAD, 2021)[4];
- The National Vegetation Map Project (VEGMAP), with the below vector dataset used for information on Biomes, Bioregions and Vegetation Type(s):
  - 2018 Final Vegetation Map of South Africa, Lesotho and Swaziland (SANBI 2006–2018; SANBI, 2018a); and
  - 2002. Subtropical Thicket Ecosystem Planning Project (STEP) vegetation types (Vlok & Euston-Brown, 2022);
- The National List of Threatened Ecosystems 2011 (SANBI 2011; South Africa, 2011);
- From the National Biodiversity Assessment (NBA, 2018) Terrestrial Assessment project (Skowno et al., 2019):
  - 2018 Terrestrial ecosystem threat status and protection level - remaining extent (SANBI, 2018b); and

[2] Datasets obtained from:
- SANBI BGIS (2022). The South African National Biodiversity Institute - Biodiversity GIS (BGIS) [online]. URL: http://bgis.sanbi.org as retrieved in 2022; and
- Department of Forestry, Fisheries and the Environment (DFFE) Environmental Geographical Information Systems (E-GIS) website. URL: https://egis.environment.gov.za/

[3] **SACAD (2021):** The types of conservation areas that are currently included in the database are the following: 1. Biosphere reserves, 2. Ramsar sites, 3. Stewardship agreements (other than nature reserves and protected environments), 4. Botanical gardens, 5. Transfrontier conservation areas, 6. Transfrontier parks, 7. Military conservation areas and 8. Conservancies.

[4] **SAPAD (2021):** The definition of protected areas follows the definition of a protected area as defined in the National Environmental Management: Protected Areas Act, (Act 57 of 2003). Chapter 2 of the National Environmental Management: Protected Areas Act, 2003 sets out the "System of Protected Areas", which consists of the following kinds of protected areas - 1. Special nature reserves; 2. National parks; 3. Nature reserves; 4. Protected environments (1-4 declared in terms of the National Environmental Management: Protected Areas Act, 2003); 5. World heritage sites declared in terms of the World Heritage Convention Act; 6. Marine protected areas declared in terms of the Marine Living Resources Act; 7. Specially protected forest areas, forest nature reserves, and forest wilderness areas declared in terms of the National Forests Act, 1998 (Act No. 84 of 1998); and 8. Mountain catchment areas declared in terms of the Mountain Catchment Areas Act, 1970 (Act No. 63 of 1970).

- 2018 Terrestrial ecosystem threat status and protection level layer (SANBI, 2018c).

- The Important Bird and Biodiversity Areas (IBA) Programme and vector dataset (BirdLife South Africa, 2015; Marnewick et al., 2015a and 2015b), in conjunction with the South African Bird Atlas Project 2 (SABAP 2);
- The International Union for Conservation of Nature (IUCN);
- The National Web-Based Environmental Screening Tool (accessed 2022) – hereafter referred to as the "screening tool';
- The Eastern Cape Biodiversity Conservation Plan (ECBCP). 2019. Compiled by the Department of Forestry, Fisheries and the Environment (DFFE) and the Department of Economic Development and Environment Affairs (DEDEA); and
- The 2017 Strategic Water Source Areas (SWSA) project:
  - 2017 SWSA Surface water (Water Research Commission, 2017).

The field assessment to determine the ecological status of the investigation area and to "ground-truth" the results of the desktop assessment was undertaken on from the 7th to the 11th of February (2022) (summer season). Results of the field assessment is presented in Parts B and C.

3 RESULTS OF THE DESKTOP ANALYSIS

3.1 Conservation Characteristics of the investigation area based on National and Provincial Datasets.

The following section contains data accessed as part of the desktop assessment and are presented as a "dashboard" report below (Table 1). The dashboard report aims to present concise summaries of the data on as few pages as possible to allow for improved assimilation of results by the reader to take place. Where required, further discussion and interpretation are provided.

Table 1: Summary of the biodiversity characteristics associated with the investigation area [Quarter Degree Squares (QDSs) 3324BD, 3325AC, 3325AD, 3325CB, and 3325DA)].

DESCRIPTION OF THE VEGETATION TYPE(S) RELEVANT TO THE INVESTIGATION AREA ACCORDING TO STEP (VLOK & EUSTON-BROWN, 2002) VEGETATION DESCRIPTIONS IN THE 2018 FINAL VEGETATION MAP OF SOUTH AFRICA, LESOTHO AND SWAZILAND (SANBI 2006–2018 & SANBI, 2018A) – FIGURE 4-5										
Biome (Figure 3)	Majority of the eastern portions and several sections in the western portion of the investigation area is situated within the **Albany Thicket** biome. Several sections of the western portion of the investigation area are situated in the **Azonal Vegetation** biome.									
Bioregion	Several sections in the western portion, majority of the eastern portion and mid-portions of the investigation area are situated within the **Albany Thicket** bioregion. Smaller sections in the eastern limb of the investigation area are situated in the **Alluvial Vegetation Bioregion**									
Vegetation Types	**ALBANY ALLUVIAL VEGETATION (AZA6) (FIGURE 4. – 5)**					**GRASSRIDGE BONTVELD (AT39) (FIGURE 4– 5)**				
Climate	Characterised by undifferentiated, year-round precipitation regime, with only two slight peaks in March and November. Warm-temperate climate.					Non-seasonal rainfall dominates the region with optimal rainfall months in March and October				
	MAP (mm)	**MAT (°C)**	**MFD (Days)**	**MAPE (mm)**	**MASMS (%)**	**MAP (mm)**	**MAT (°C)**	**MFD (Days)**	**MAPE (mm)**	**MASMS (%)**
	354	18.1	4	2011	Unknown	452	17.8	3	1861	76
Altitude (m)	20 –1 000					0 – 399				
Distribution	Eastern Cape Province: Between East London and Cape St Francis on wide floodplains (usually close to the coast where the topography becomes flatter) of the large rivers such as the Sundays, Zwartkops, Coega, Gamtoos, Baviaanskloof, Great Fish River etc.					This vegetation type occurs in the Eastern Cape Province. Predominantly occurs northeast of Port Elizabeth just inland of Algoa Bay, mainly around Coega, but also in small patches near Addo Elephant National Park.				
Geology & Soils	Underlain by Jurassic-Cretaceous sediments of the Uitenhage Group. The alluvial zones (recent alluvial deposits of various textures, but usually with high clay content) can become flooded following the west-east passage of frontal systems in autumn and winter or during intensive local storms in summer. Ia land type[5].					The vegetation type predominantly occurs on shallow clay, often lime-rich soil on the Bluewater Bay, Alexandria and Nanaga Formations. The most important land types are Fc and Ae.				
Conservation	**Endangered.** Target 31%. Only about 6% statutorily conserved in the Greater Addo Elephant National Park, Baviaanskloof Wilderness Area, Loerie Dam, Springs, Swartkops Valley and Yellowwoods Nature Reserves and the Double Drift Reserve Complex. About 2% enjoys protection in eight private conservation areas. More than half of the area has been transformed for cultivation, urban development, road building and plantations. Alien invaders include *Acacia saligna*, *Nerium oleander* and *Eucalyptus* species.					**Least Concern.** Target 19%. Conserved in the Addo Elephant National Park and Kaapse Grysbok Private Nature Reserve. Approximately 9.5a % of the area is transformed. Threats include: Cultivation, mining, urban sprawl, and roads. Erosion is low to medium				
Vegetation & Landscape Features (Dominant Floral Taxa in Appendix D)	Two major types of vegetation pattern are observed in these zones, namely riverine thicket and thornveld (*Vachellia natalitia*). The riverine thicket tends to occur in the narrow floodplain zones in regions close to the coast or further inland, whereas the thornveld occurs on the wide floodplains further inland.					On moderately undulating plains. A mosaic of low thicket (2 – 3 m) consisting of bush clumps of variable size in a matrix of low (0.2-0.8 m) grassy dwarf-shrubland. This unit is often restricted to 'islands' in a matrix of typical AT 51 Sundays Valley Thicket. The species present in the grassy dwarf-shrubland are a mixture of Fynbos, Grassland and Karroid elements, with *Themeda triandra* often dominant.				

[5] **Land types** refer to a class of land with specified characteristics. In South Africa it has been used as a unit denoting land at 1:250 000 scale, over which there is a marked uniformity of climate, terrain form and soil pattern. Land type Bd refers to non-red soils (Hu, Bv <33%) that are usually more dystrophic/mesotrophic than they are eutrophic, Land type Bc refers to upland duplex and margalitic soils that have a Plinthic catena less than 10%, Land type Ae refers to Red (yellow soils <10%) that are more eutrophic than dystrophic/mesotrophic, and Land type Ia refers to a miscellaneous soil class.

Vegetation Types	SUNDAYS ARID THICKET (AT49) (CORRESPONDING TO STEP VEGETATION) (Figure 4 – 5)					SUNDAYS VALLEY THICKET (AT51) (CORRESPONDING TO STEP VEGETATION) (Figure 4 – 5)				
Climate	Non-seasonal rainfall dominates the region. The mean monthly maximum is 30.56 °C in January and the mean monthly minimum is 3.74 °C in July.					Non-seasonal rainfall dominates the region. The mean monthly maximum is 28.09 °C in February and the mean monthly minimum is 6.23 °C in July.				
	MAP (mm)	**MAT (°C)**	**MFD (Days)**	**MAPE (mm)**	**MASMS (%)**	**MAP (mm)**	**MAT (°C)**	**MFD (Days)**	**MAPE (mm)**	**MASMS (%)**
	159 – 550	17.5	3 – 44	2134	80	210 – 631	17.5	2 – 138	2134	80
Altitude (m)	108 – 1467					2 – 673				
Distribution	This vegetation type occurs in the Eastern Cape Province. Most extensive in the upper Sundays River Valley, centered around Jansenville and Darlington Dam, with smaller areas west of Klipplaat. Also in dry valleys from Volstruisleegte (north of Willowmore) eastward to Steytlerville and Kleinpoort, and the dry valley north of the Baviaanskloof and Groot Winterhoek Mountains from near Boxmoor in the west to near Kirkwood in the east. Smaller isolated patches also occur along the northern slopes of the eastern Swartberg Mountains around Toorwaterpoort, and in the Baviaanskloof between Studtis and Zandvlakte.					This vegetation type occurs in the Eastern Cape Province. Primarily in the lower Sundays River Valley, from near Kleinpoort in the west toward Paterson and Colchester in the east. Also centered around Uitenhage in the lower Coega and Swartkops River Valleys, and in the middle reaches of the Gamtoos River Valley and some smaller rivers to the west (e.g., Kabeljous River) south of the Baviaanskloof Mountains.				
Geology & Soils	The vegetation type typically occurs on the Koonap, Middleton and Fort Brown Formations in heavy clay soils. The main land types are Fc and Ib.					The vegetation type typically occurs on the Kirkwood Formations, Sundays River and Enon Formations, in deep loamy-clayey soils. The main land types are Fc, Ae and Ag				
Conservation	**Vulnerable.** Target 19%. Conserved in Addo Elephant National Park and Noorsveld Protected Environment. Approximately 1.71% of the area is transformed. Threats include overgrazing and small stock grazing, erosion is variable.					**Least Concern.** Target 19%. Conserved in Addo Elephant National Park and the Cape Floral Region Protected Areas: Baviaanskloof. Approximately 11.86% of the area has been transformed. Threats include: Cultivation and urban sprawl. Erosion is low to medium				
Vegetation & Landscape Features (Dominant floral taxa in appendix D)	Typically common on flat lowlands and undulating plains. Short (1 – 2 m) and dense succulent thicket with *Portulacaria afra* often dominant. Where *P. afra* is naturally uncommon, *Euphorbia radyeri* is locally dominant and the tree component (*Boscia oleoides, Euclea undulata, Pappea capensis*) is sparse. Pockets of karroid shrubland (*Pentzia incana, Rhigozum obovatum*) also occur in this thicket unit.					The vegetation type occurs on undulating plains, low foothills and mountain slopes. Medium-sized to tall (3 - 5 m) dense thicket in which the woody tree and shrub component, and the succulent component, are well developed, with many spinescent species. There are no distinct strata in the vegetation as the lower and upper canopy species intertwine, often with a wide variety of lianas linking the understorey with the canopy. Emergents are uncommon, but *Euphorbia grandidens*, *E. triangularis*, and occasionally *Cussonia gamtoosensis* and *C. spicata* emerge above the canopy. The abundance of *Portulacaria afra* and other succulent shrubs (e.g. *Aloe speciosa, Euphorbia caerulescens*) increases in more arid sites, while local soil conditions also influence composition of the vegetation -there is thus considerable structural heterogeneity within this vegetation unit.				

CONSERVATION DETAILS PERTAINING TO THE AREA OF INTEREST (VARIOUS DATABASES)	
NBA (2018): **1) Ecosystem threat status** **2) Ecosystem protection level** **Figures 6-8**	According to the NBA (2018) dataset, small portions of the eastern and central portions of the investigation area is located within the **Endangered (EN)** and **Poorly Protected (PP)**. The eastern portion of the investigation area is located in the **Least Concern (LC)** and **Moderately Protected (MP**) Grassridge Bontveld. Several sections in the mid-portion of the investigation area, including route alternative 1 is located in the Sunday Arid Thicket which is **Vulnerable (VU)** and **MP**; and large sections in the eastern and western portion of the investigation area are located in the Sundays Valley Thicket, which is **LC** and **MP**. The NBA is the primary tool for monitoring and reporting on the state of biodiversity in South Africa. Two headline indicators that are applied to both ecosystems and species are used in the NBA: **threat status** and **protection level**: i. Ecosystem threat status tells us about the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function, and composition, on which their ability to provide ecosystem services ultimately depends. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or LC, based on the proportion of each ecosystem type that remains in good ecological condition relative to a series of thresholds. ii. Ecosystem protection level tells us whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Not Protected, Poorly Protected, Moderately Protected or Well Protected, based on the proportion of each ecosystem type that occurs within a protected area recognised in the NEMPAA.
National Threatened Ecosystems (2011) **Figure 9**	Approximately half of the investigation area in the west is located within the **EN Albany Alluvial Vegetation** ecosystem, listed under criterion **A1** of GN 1002 page 184. This ecosystem is located between East London and Cape St Francis on wide floodplains (usually close to the coast where the topography becomes flatter) of the large rivers for example the Sundays, Zwartkops, Coega, Gamtoos, Baviaanskloof and Great Fish River. This alluvial ecosystem is embedded within the Albany Thicket Biome. Criterion A1 = Ecosystems that have experienced irreversible toss of natural habitat. In the case of endangered ecosystems, remaining natural habitat is ≤ (biodiversity target + 15%). EN ecosystems are those that have undergone degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems. For Environmental Impact Assessments (EIAs), the 2011 National list of Threatened Ecosystems remains the trigger for a Basic Assessment in terms of Listing Notice 3 of the EIA Regulations 2014, as amended published under the National Environmental Management Act, 1998 (Act No. 107 of 1998). However, the updated 2018 ecosystem threat status have been considered in the assessment of impact significance in EIAs.
IBA (2015)	No IBAs are located within 10 km of the investigation area
Protected areas in vicinity of investigation area **SACAD (2021, Q3);** **SAPAD (2021, Q3);** **NPAES (2010)** **Figure 10-13**	According to SACAD (2021, Q3) database, no conservation areas are located within 10 km of the investigation area. However, according to the SAPAD (2021 Q3) and NPAES (2010) database, the Addo Elephant National Park and Uitenhage Nature Reserves are located within a 10 km radius of the investigation area. NPAES (2010) database indicates that three informal protected areas immediately border or traverse the proposed OHPL namely: Blaawbosch Game Farm, Schuilpatdop Game Farm, and Grassridge Private Nature Reserve. Other informal protected areas in a 10 km radius are: Paardekop Game Farm, Voetpadskloof Game Farm, Cistruslandgoed Game Farm, Inthaba Lodge Game Garm, Tregathlyn Game Farm, Goodehope Game Farm and Brakkefontein Game Farm. One focus area namely the Baviaans-Addo Nature Reserve is located in a 10 km radius of the investigation area.
World Heritage Sites	No world heritage sites are located within 10 km of the investigation area.

EASTERN CAPE BIODIVERSITY CONSERVATION PLAN (ECBCP) (2019)	
CBA Terrestrial (Figure 14)	According to this dataset, the investigation area is located within a CBA1, CBA2 and ESA 1. An ESA 1 makes up the majority of the investigation area, with smaller sections in the west and centre portions in a CBA 1 or 2. Additionally, central portions of the investigation areas are located in "Other Areas". There are several following reasons that an area classifies as a CBA1, according to ECBCP (2019): 1. They are considered "critical" patches" comprising Critically Endangered ecosystems or comprising priority forest clusters; 2. They are "Irreplaceable" sites (selection frequency >80%) for meeting conservation target, i.e., they are important vegetation types, species points or expert areas; and 3. They are within a 500m buffer of special faunal habitats, e.g., bat roost sites, and vulture nesting sites. Land use guidelines within a CBA 2 as stated by the ECBCP: Maintain in a natural state (or near-natural state if this is the current condition of the site) that secures the retention of biodiversity pattern and ecological processes. For areas classified as CBA1, the following objectives must apply; ecosystem and species must remain intact and undisturbed, since these areas demonstrate high irreplaceability, if disturbed or lost, biodiversity targets will not be met, and these biodiversity features are at, or beyond, their limits of acceptable change. Therefore, if land use activities are unavoidable in these areas, and depending on expert opinion of the condition of the site, a Biodiversity Offset must be designed and implemented. Reasons for an area being classified as a CBA2: 1. These localities are considered to "Best Design Sites" (selection frequency <80%) for reaching biodiversity targets, i.e., they are important vegetation types, species points or expert areas; 2. They are special habitats, i.e., selected cliffs buffered by a 100 m; 3. All other forest Land use guidelines within a CBA 2 as stated by the ECBCP: Maintain in natural (or near-natural state if this is the current condition of the site) that secures the retention of biodiversity pattern and ecological processes. For areas classified as CBA2, the following objectives must apply; Ecosystem and species must remain intact and undisturbed, there is some flexibility in the landscape to achieve biodiversity targets in these areas. It must be noted that the loss of a CBA2 area may elevate other CBA 2 areas to a CBA 1 category and these biodiversity features are at risk of reaching their limits of acceptable change. Furthermore, if land use activities are unavoidable in these areas, and depending on the condition of the site, set-aside areas must be designed in the layout and implemented. If site specific data confirms that biodiversity is significant, unique and/or highly threatened or that a Critically Endangered or Endangered species is present, Biodiversity Offsets must be implemented Reasons for an area being classified as an ESA1: 1. It is a forest (is within 500 m of a forest buffer); 2. It is a special habitat, i.e. a cliff or within 500 m of a cliff buffer; 3. It is an ecological corridor required to connect an ecological network. It is considered a "best design" corridor site. It forms part of the planning units selected to meet 60% targets for vegetation types; 4. It is deemed to be a climate change refugia offering resilience against climate change; 5. It is a coastal functioning zone; 6. Aquatic landscape; ESA extend into catchments that are essential for the maintenance of CBA rivers and wetlands Land use guidelines within an ESA 1 as stated by the ECBCP: Maintain ecological function within the localised and broader landscape. A functional state in this context means that the area must be maintained in a semi-natural state such that ecological function and ecosystem services are maintained. For areas classified as ESA 1 the following objective apply; these areas are not required to meet biodiversity targets, but they still perform essential roles in terms of connectivity, ecosystem service delivery and climate change resilience; these systems may varying in condition and maintaining function is the main objective,

	therefore these ecosystems still in natural, near natural state should be maintained and those ecosystems that are moderately disturbed/degraded should be restored. In summary CBAs and ESAs are terrestrial and aquatic features in the landscape that are critical for conserving biodiversity and maintaining ecosystem functioning. Other Areas (OAs) are all remaining natural areas not included in the above CBA or ESA categories.
Formally Protected Areas	The investigation area is not located within any formally protected areas.
NATIONAL WEB BASED ENVIRONMENTAL SCREENING TOOL (2020)	
The screening tool is intended to allow for pre-screening of sensitivities in the landscape to be assessed within the EA process. This assists with implementing the mitigation hierarchy by allowing developers to adjust their proposed development footprint to avoid sensitive areas	
Terrestrial Theme (Figure 15)	Majority of the western and mid-portion of the investigation area is assigned a very high terrestrial sensitivity. The very high sensitivity is attributed to the presence of a CBA 1, a CBA 2, an ESA 1, Freshwater Ecosystem Priority Area (FEPA) Sub-catchments and an EN ecosystem. A smaller area in the eastern portion is of low terrestrial sensitivity.
Plant Species Theme (Figure 16)	Majority of the investigation area is assigned **a high plant sensitivity**. The medium sensitivity is triggered by the Probability of Occurrence (**POC**) of the following plant SCC: Sensitive species 1252, *Trichodiadema aureum* (VU), Rhombophyllum *rhomboideum* (EN), *Argyrolobium barbatum* (VU), Sensitive species 1235, Sensitive species 1268, *Selago zeyheri* (VU), *Salvia obtusata* (VU), *Apodolirion macowanii* (VU), Sensitive species 570 and Sensitive species 779
Animal Species Theme (Figure 17)	Majority of the investigation area is assigned **a medium animal sensitivity**. The medium sensitivity is triggered by the POC of the following SCC: *Aneuryphymus montanus* (Yellow-winged Agile Grasshopper, VU), *Circus ranivorus* (African Marsh Harrier, EN), *Circus maurus* (Black Harrier, EN), *Neotis denhami (*Denhams Bustard, VU), *Bradypterus sylvaticus* (Knysna Warbler, VU), *Acinonyx jubatus* (Cheetah, VU) ,*Chlorotalpa duthieae* (Duthie's Golden Mole VU), Sensitive species 7 and Sensitive species 18. **A smaller area in the east (in the Grassridge Bontveld) is deemed to have a high animal sensitivity** that was triggered by: Sensitive species 18, *Circus ranivorus*, *Circus maurus* and *Neotis denhami* in this eastern locality.
STRATEGIC WATER SOURCE AREAS FOR SURFACE WATER (2017)	
Surface water areas (SWAs) are defined as areas of land that supply a disproportionate (i.e., relatively large) quantity of mean annual surface water runoff in relation to their size. They include transboundary areas that extend into Lesotho and Swaziland. The sub-national water source areas (WSAs) are not nationally strategic as defined in the report but were included to provide a complete coverage	
Name & Criteria	No SWSAs occur within 10 km of the investigation area.
CENTRES OF ENDEMISM (VAN VYK AND SMITH, 2001)	
Name of Endemic Centre (Figure 18)	The investigation area is situated in the Albany Centre of endemism.

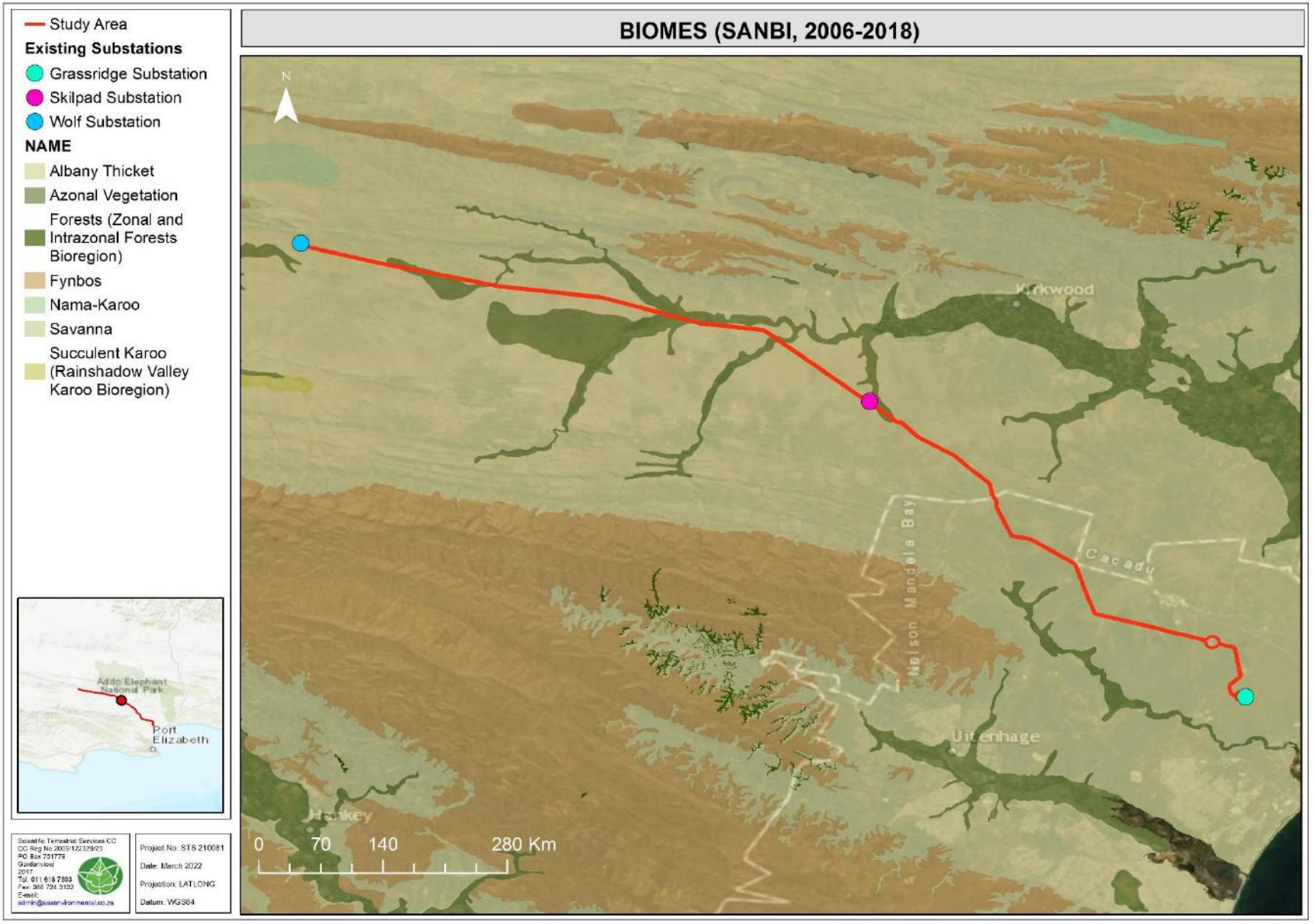

Figure 4: Biomes and bioregions associated with the investigation area, according to the VEGMAP by Vlok & Euston-brown (2002; SANBI, 2006-2018).

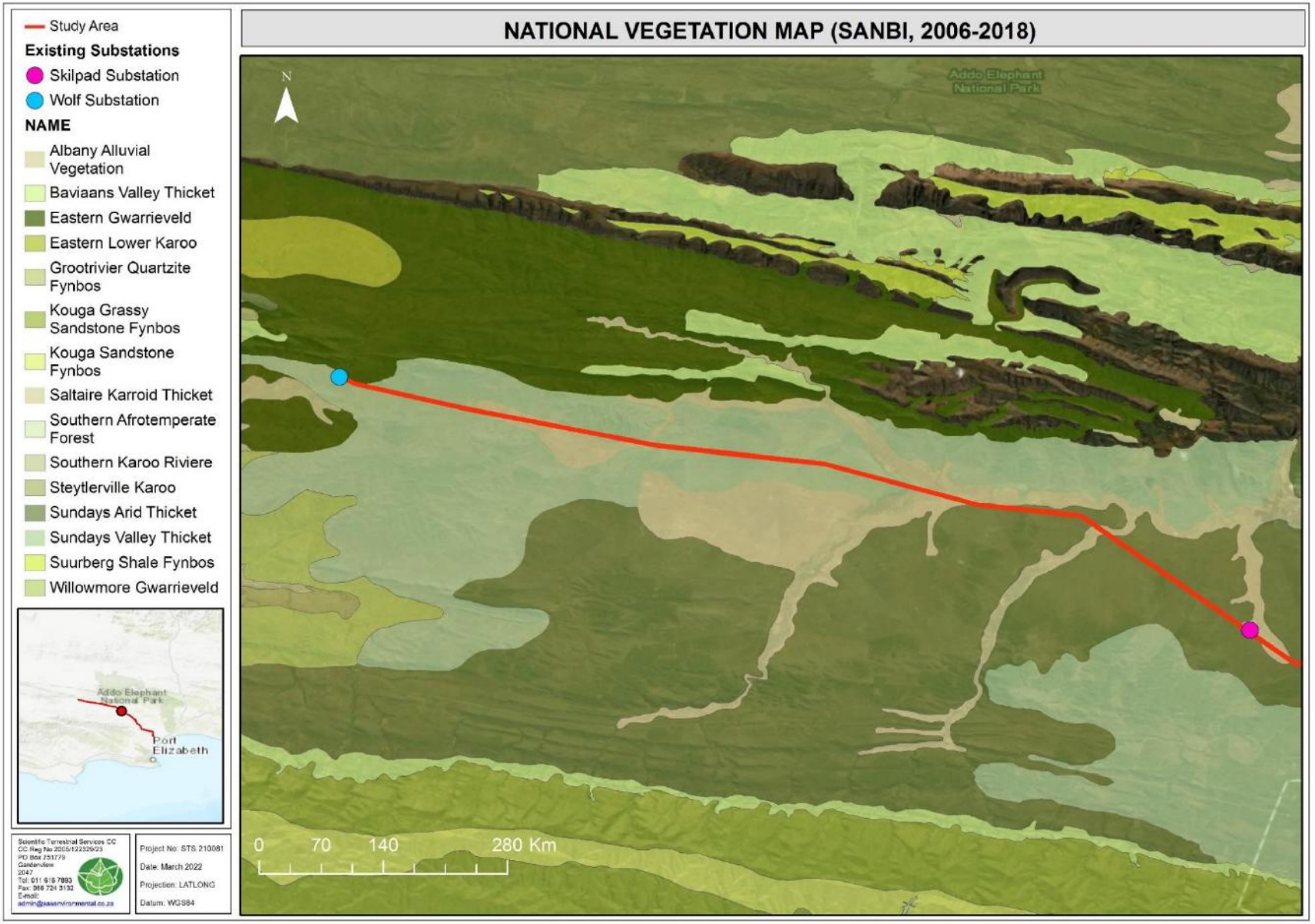

Figure 5: The vegetation types associated with the western portion of the investigation area (VEGMAP by Vlok & Euston-brown (2002; SANBI, 2006-2018).

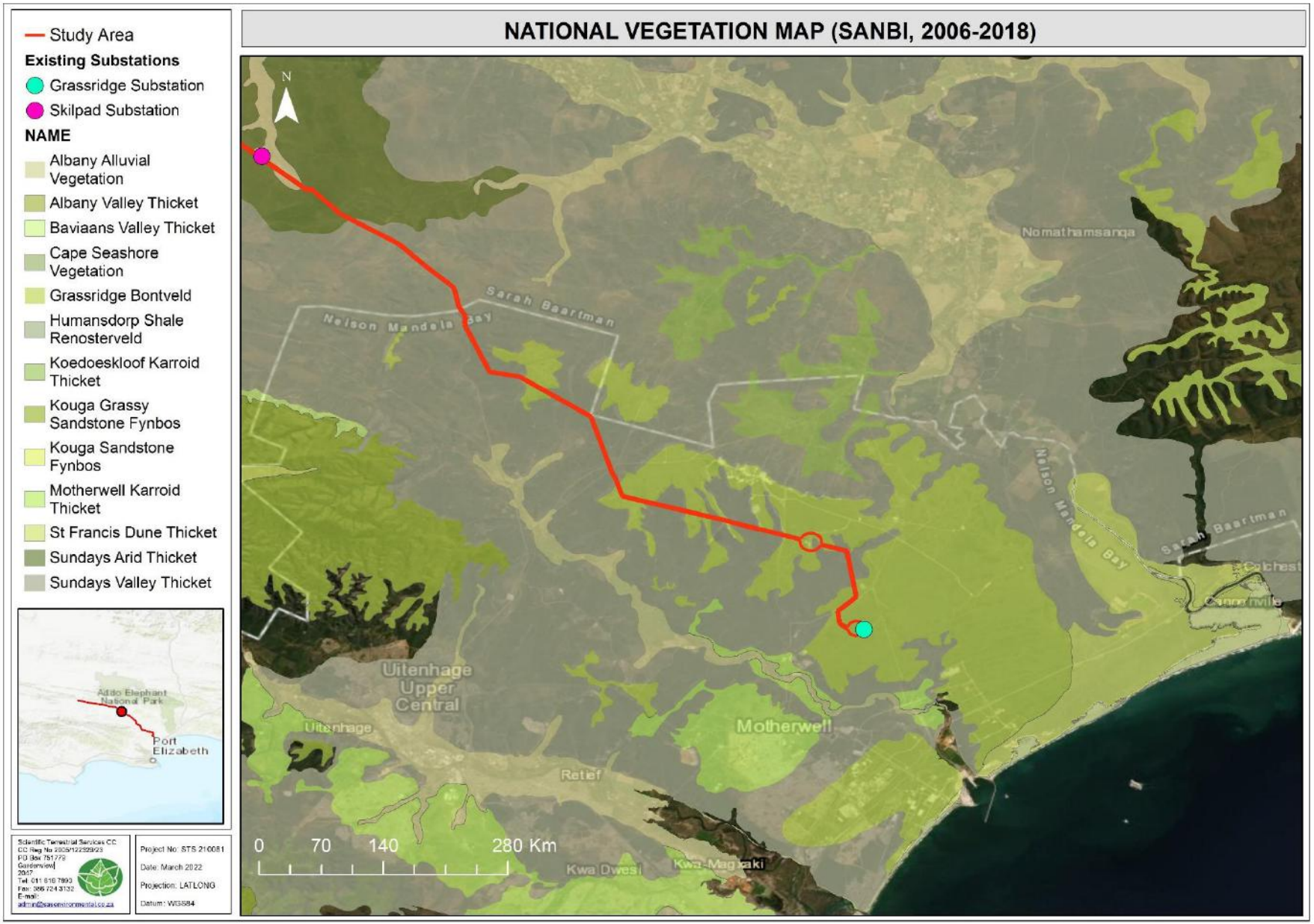

Figure 6: Vegetation types associated with the eastern portion of the investigation area, according to the VEGMAP (2018) dataset.

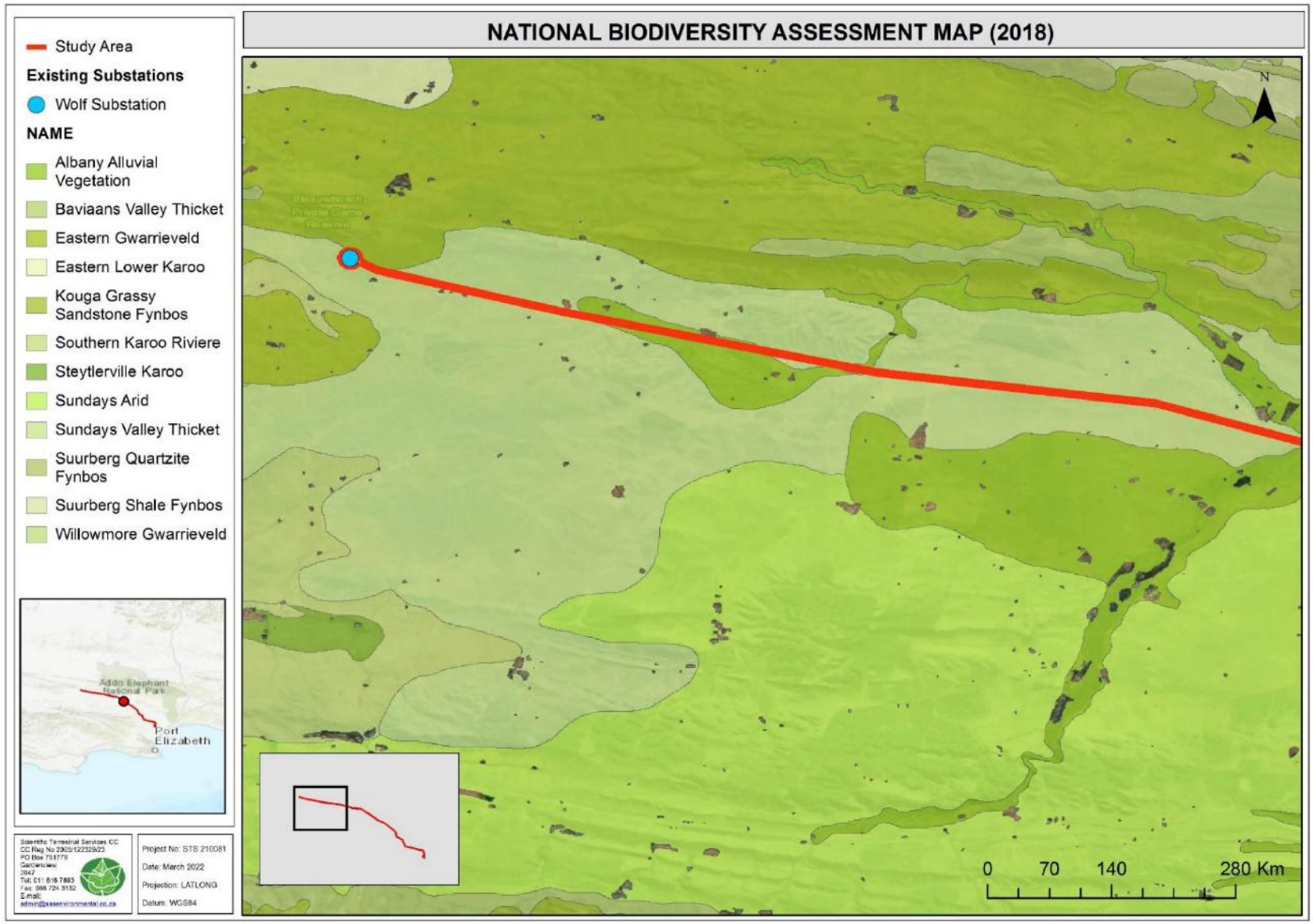

Figure 7: The remaining extent of vegetation types and their protected status along the western portion of the investigation area, according to the National Biodiversity Assessment (NBA, 2018).

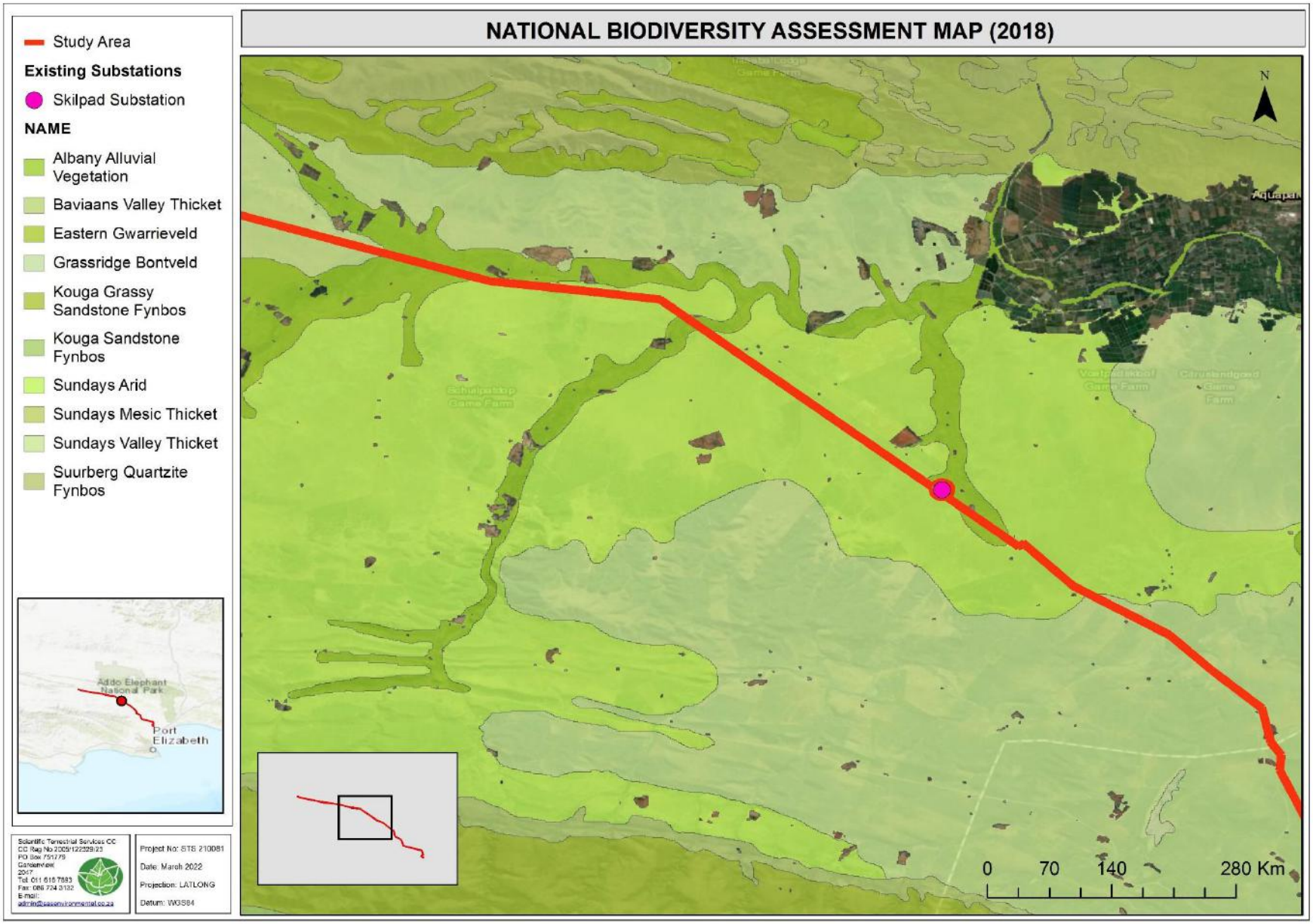

Figure 8: Vegetation types and their protection status along eastern portion of the investigation area (NBA, 2018).

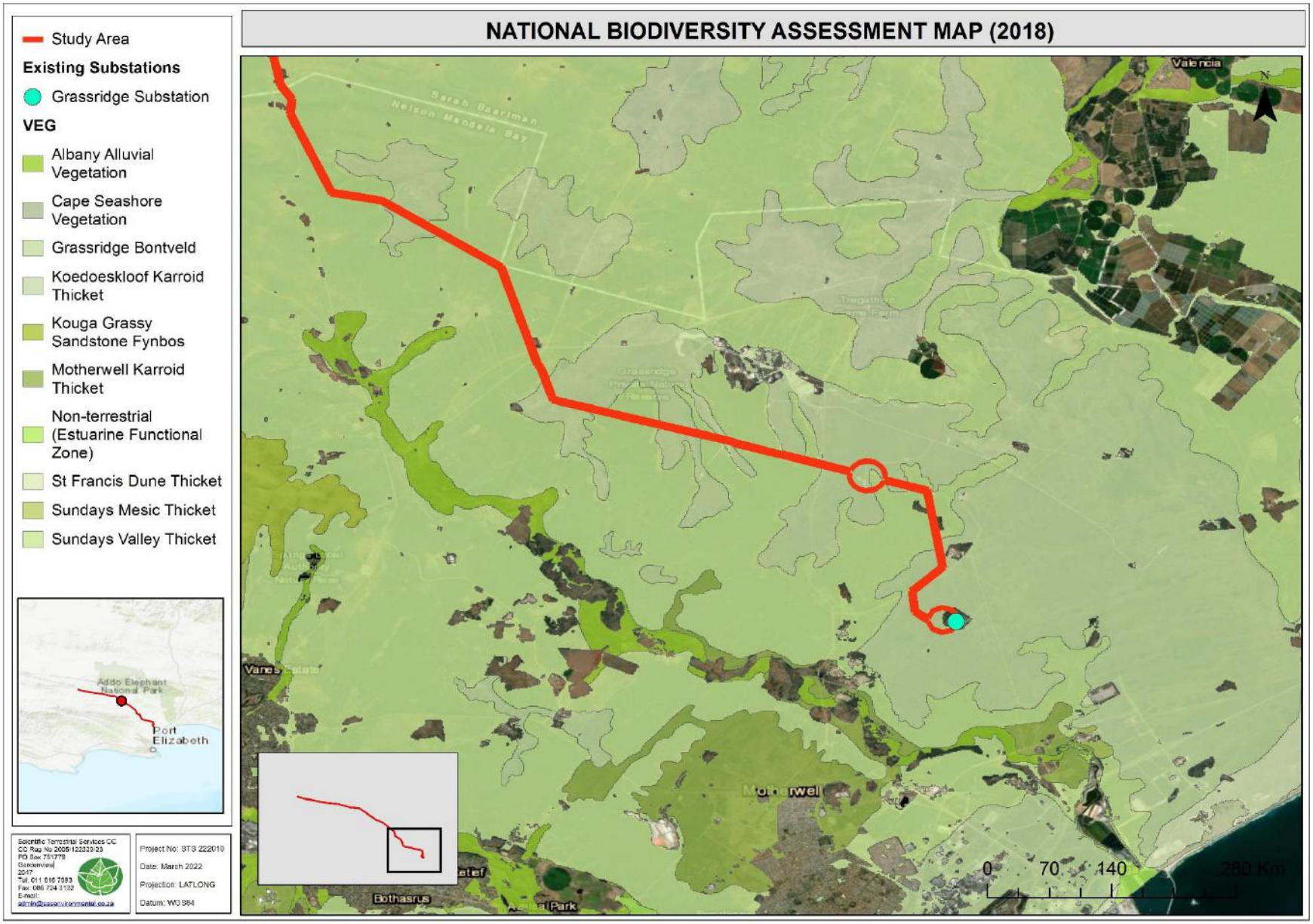

Figure 9: Vegetation types associated with proposed alternative route 1, according to the NBA (2018) dataset.

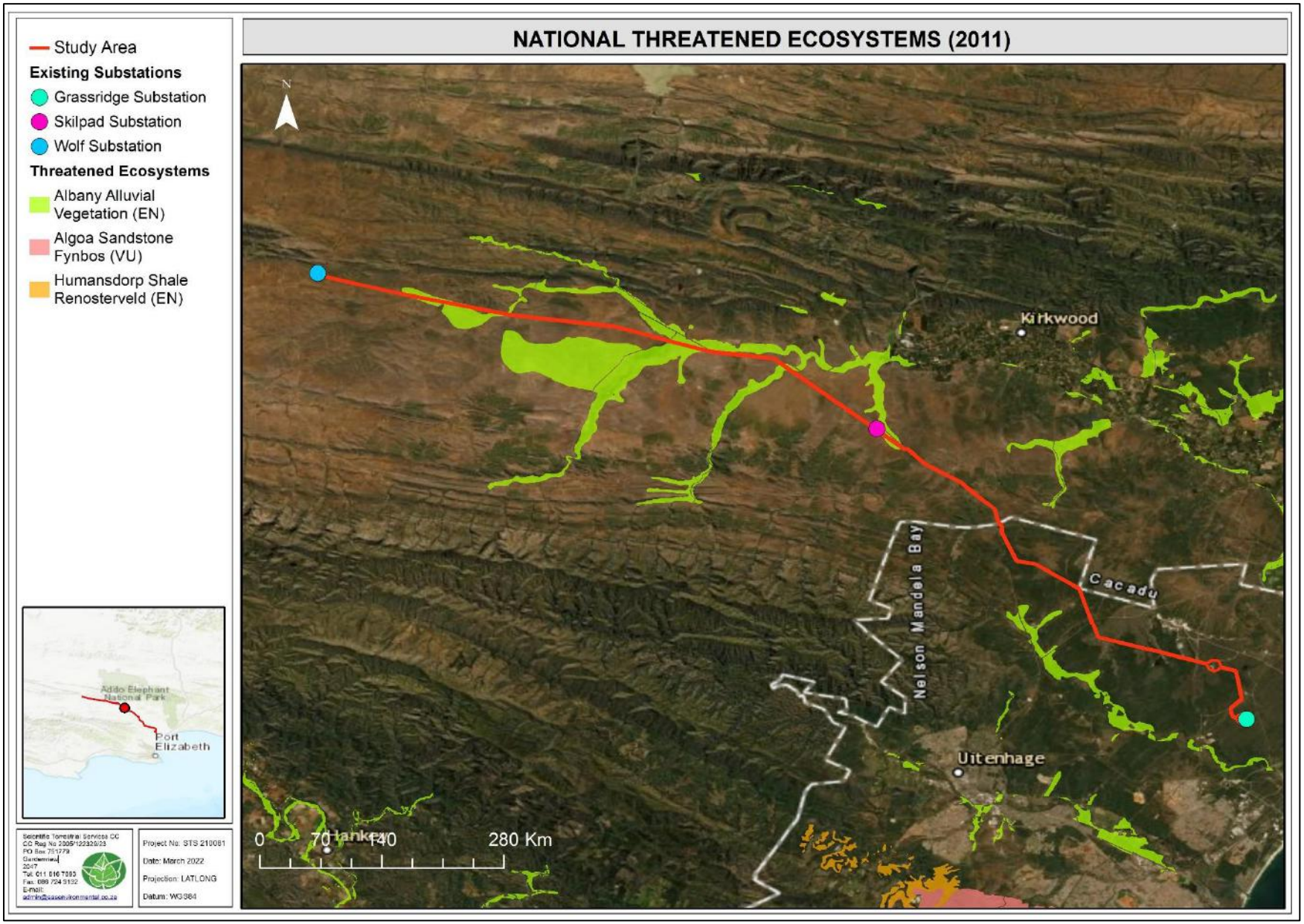

Figure 10: Threatened ecosystems associated with the investigation area.

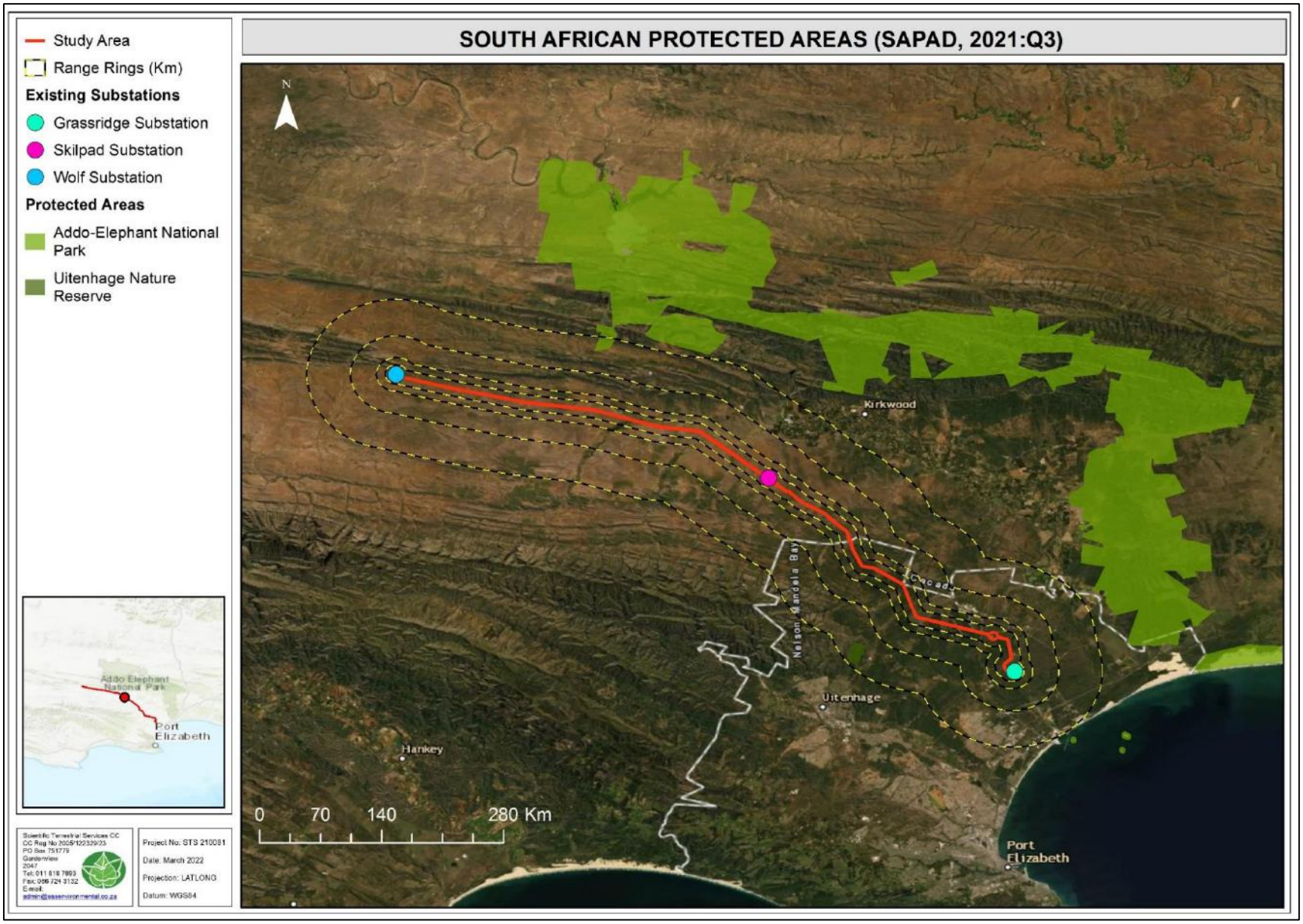

Figure 11: Protected areas within a 10km radius of the investigation area according to SAPAD (2021, Q3).

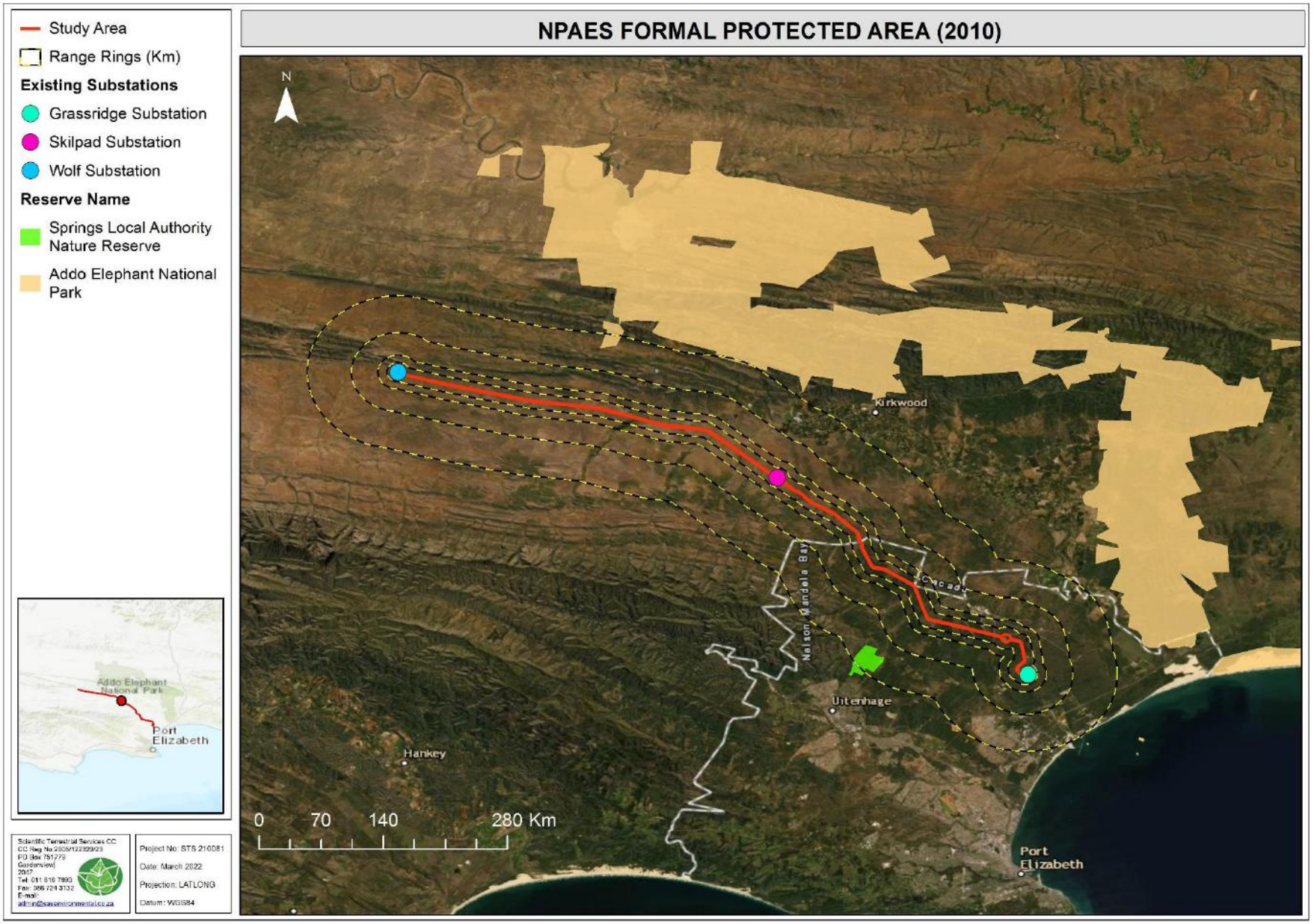

Figure 12: Formally protected areas associated with the investigation area according to NPAES (2010).

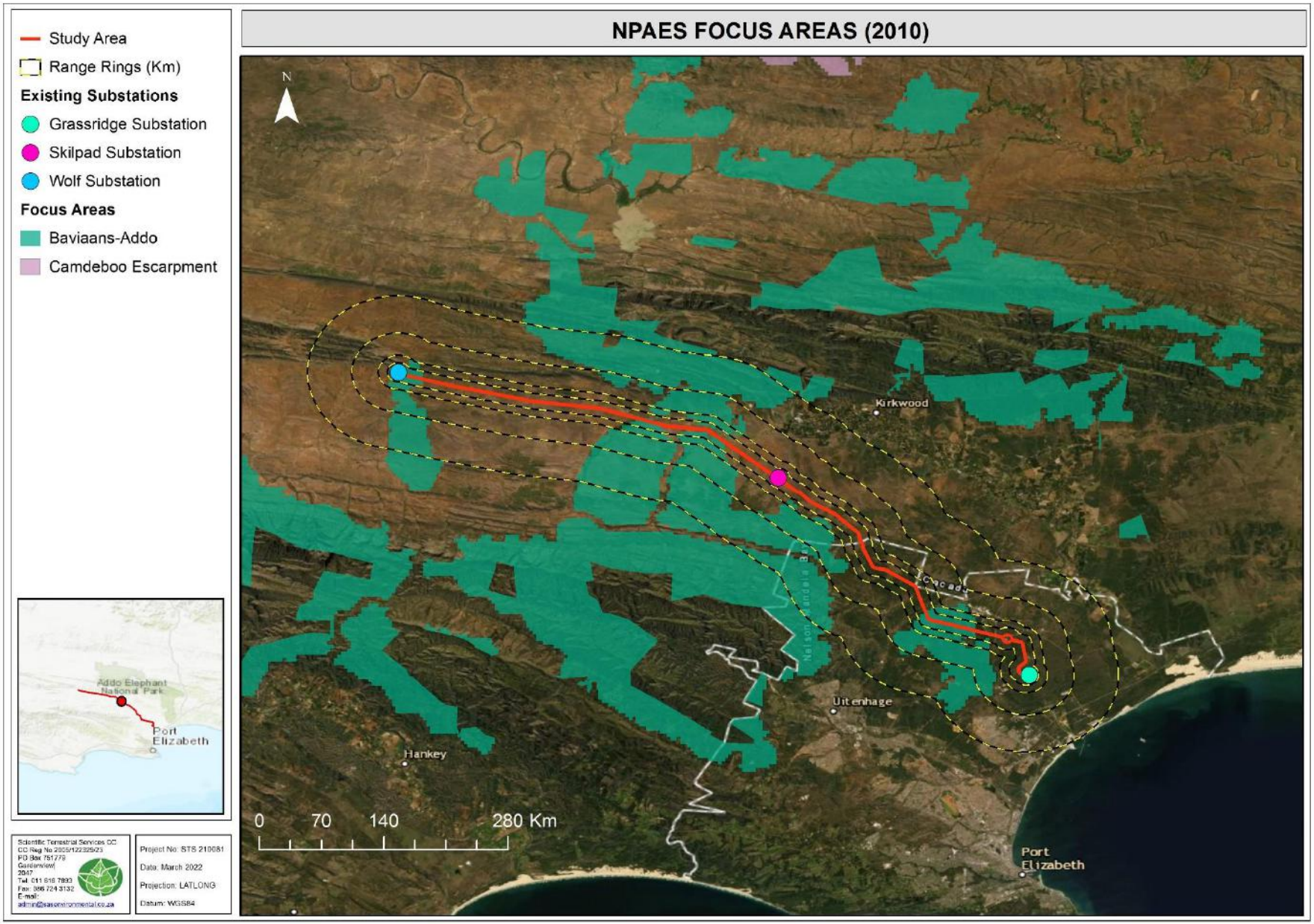

Figure 13: Formal focus areas associated with the investigation area, according to NPAES (2010).

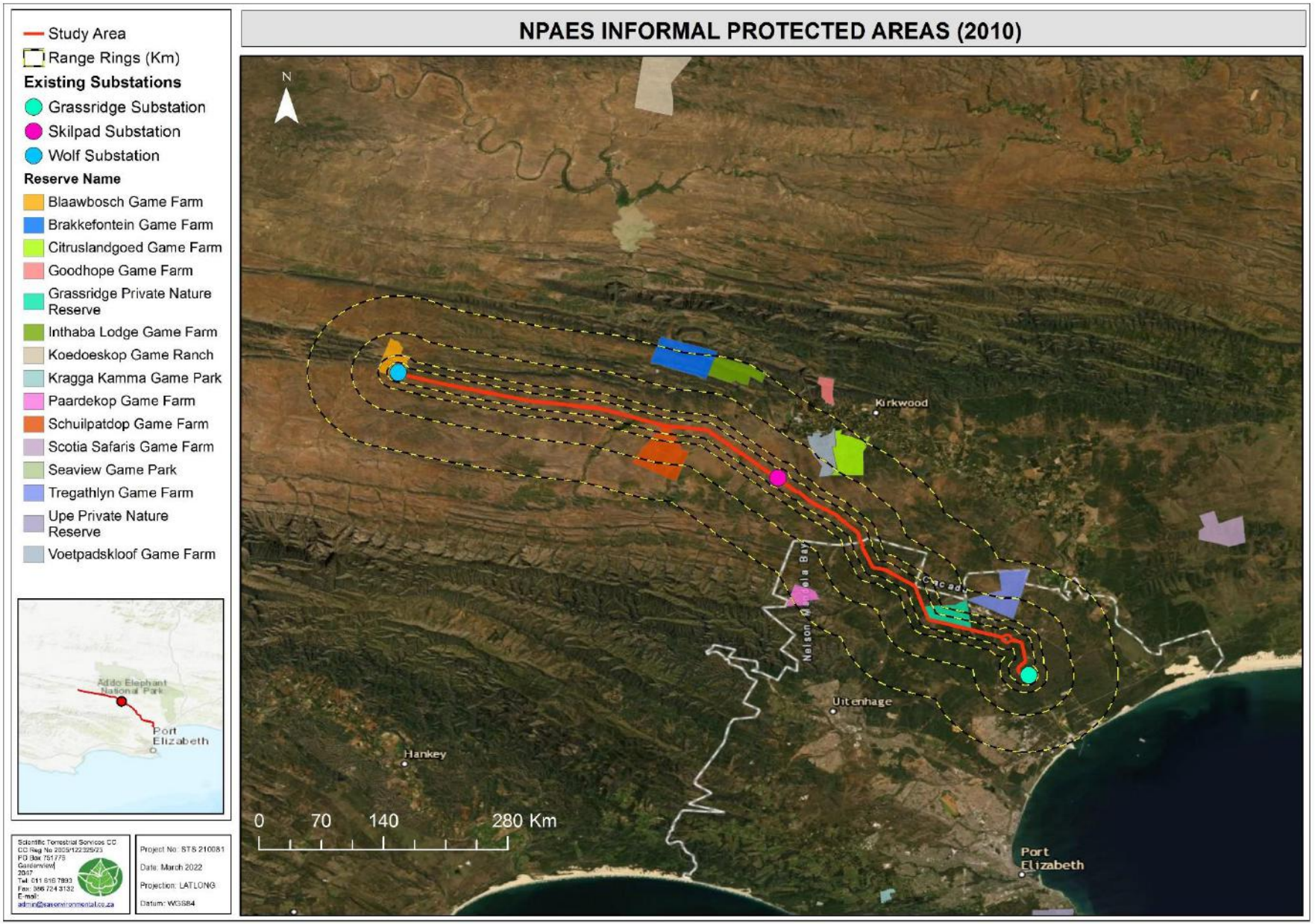

Figure 14: Informally protected areas associated with the investigation area according to NPAES (2010).

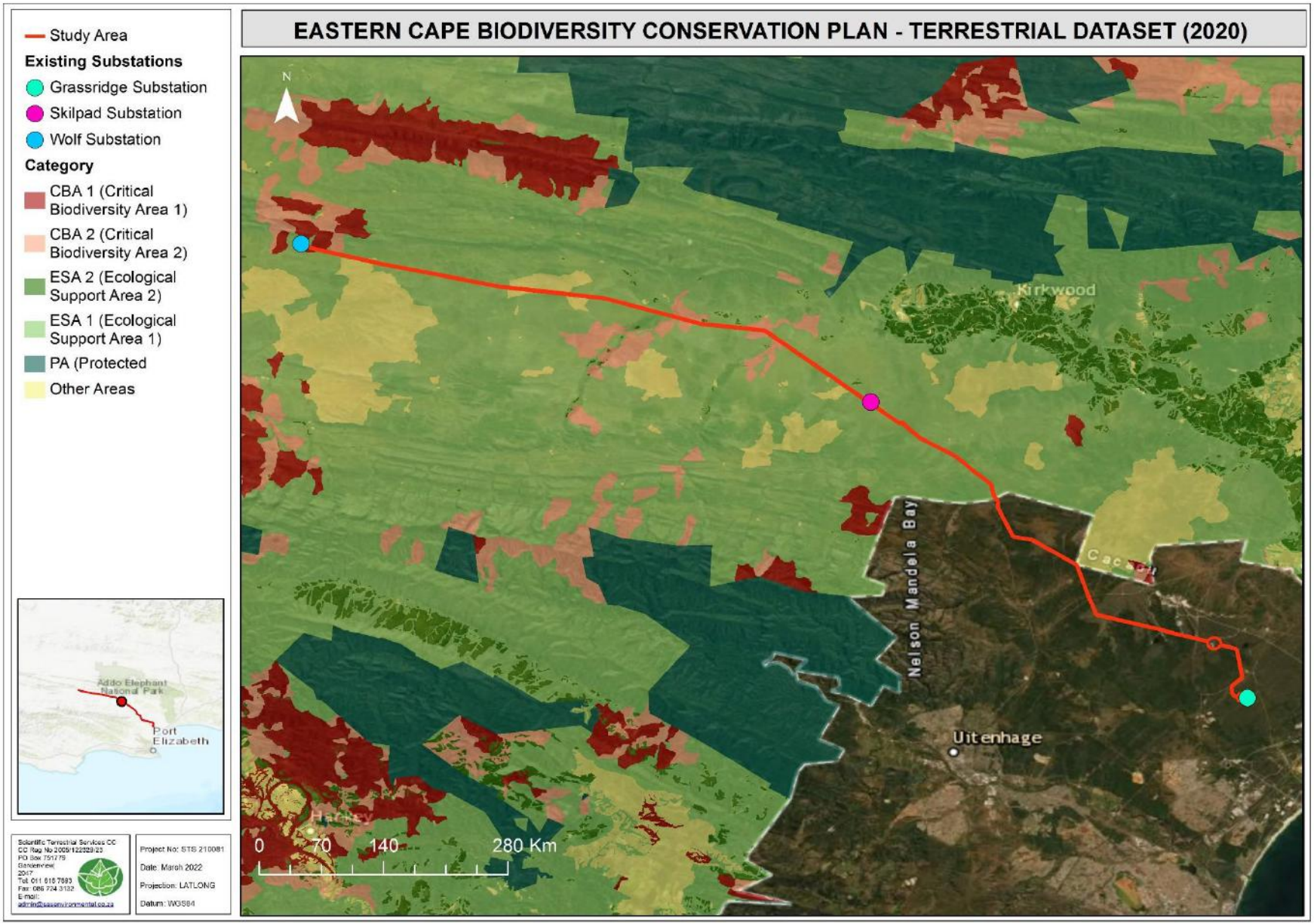

Figure 15: Important biodiversity features relating to the investigation area according to the Eastern Cape Biodiversity Plan.

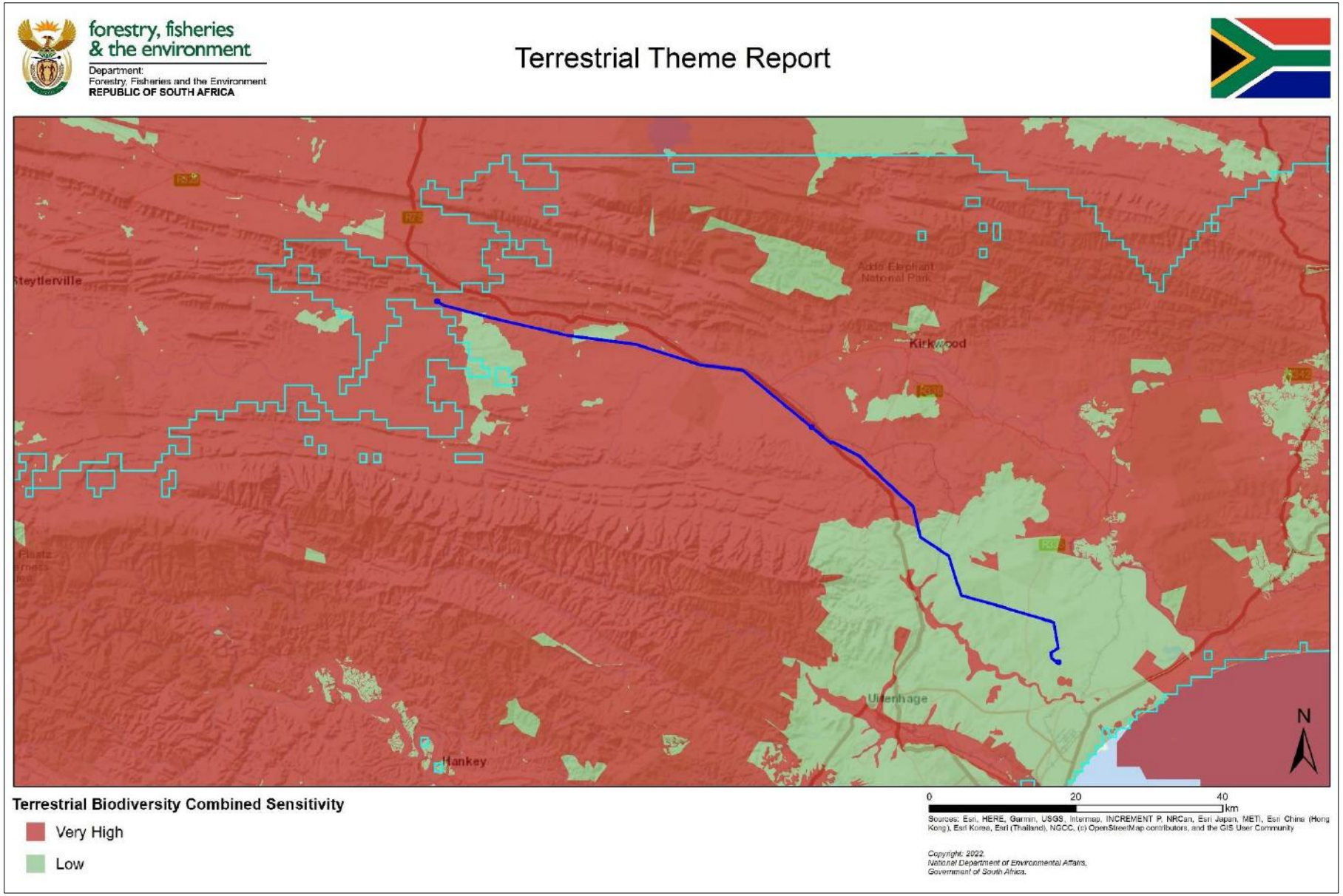

Figure 16: Combined Terrestrial Theme associated with the investigation area according to the online screening tool.

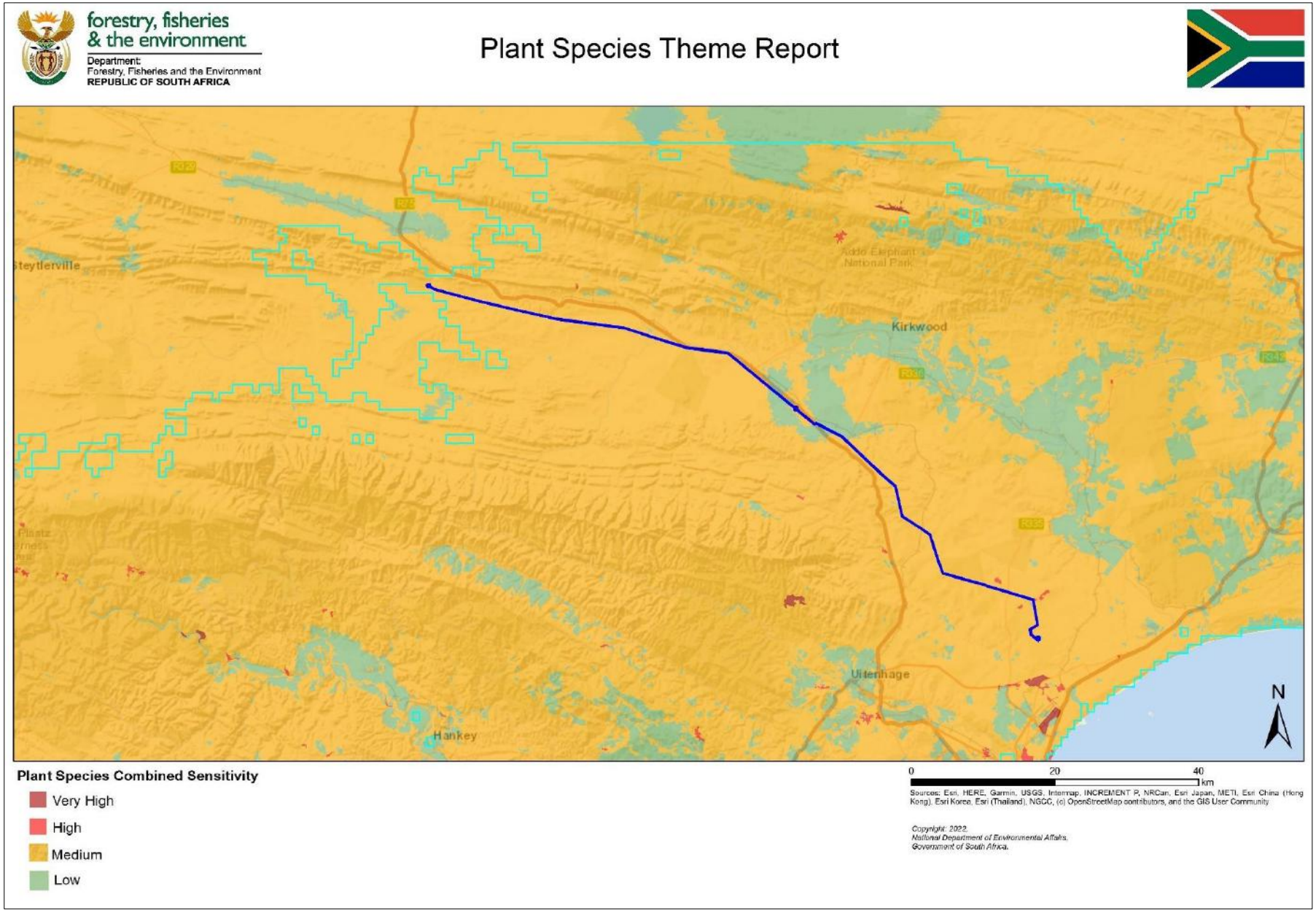

Figure 17: Plant species sensitivity theme associated with the investigation area, according to the online screening tool.

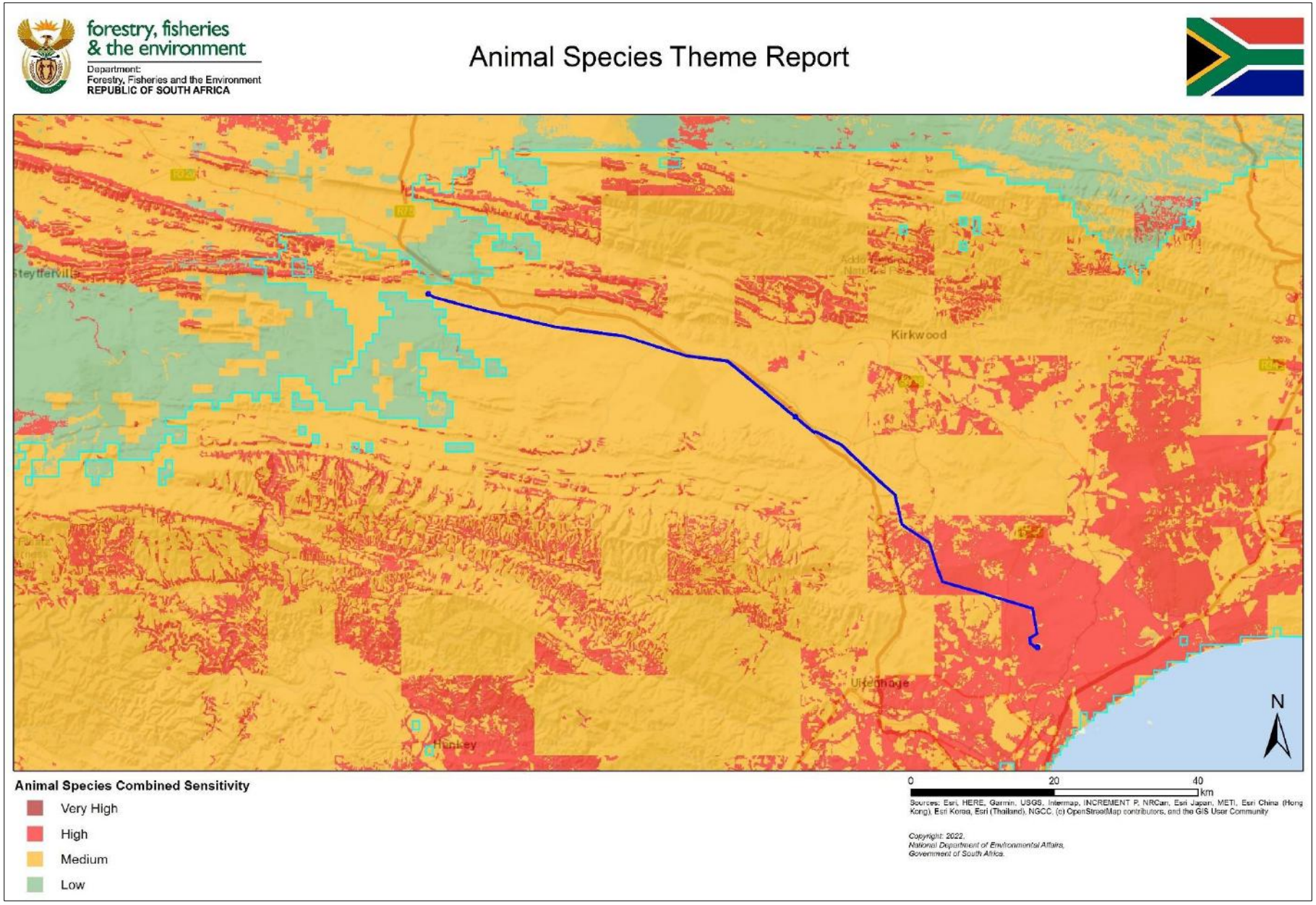

Figure 18: Animal species sensitivity theme associated with the investigation area, according to the online screening tool.

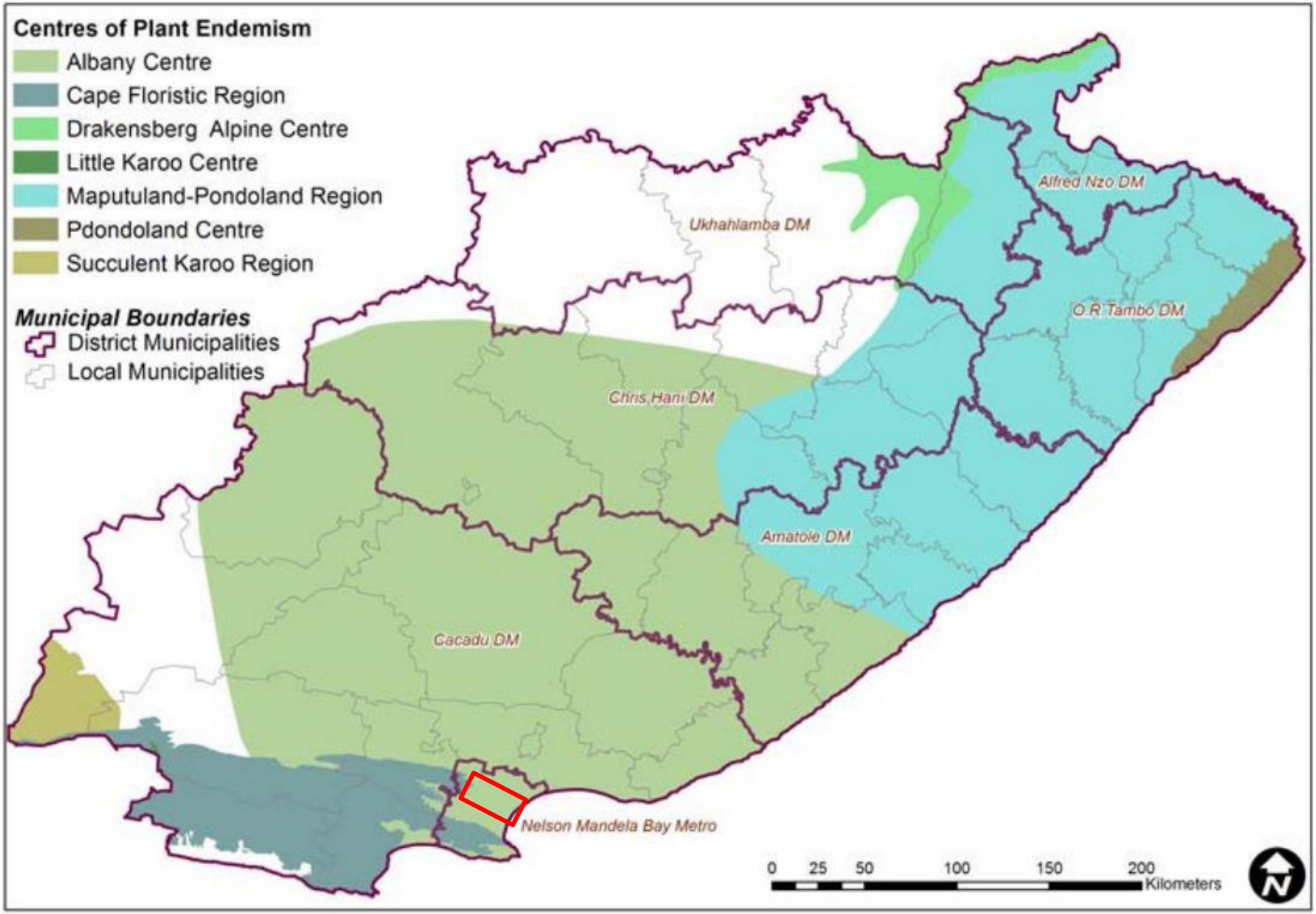

Figure 19: Centres of endemism of the Eastern Cape: the investigation area is indicated in red (ECBCP, 2007).

4 STRUCTURE OF THE BIODIVERSITY REPORT

Part A of this report served to introduce the investigation area, as well as the general approach to the study. Part A also presents the results of general desktop information reviewed as part of the study, including the information generated by the relevant authorities as well as the context of the site in relation to the surrounding anthropogenic activities and ecological character.

Part B presents the results of the floral field assessment, data analyses and discussion of the results. Part B then presents the results of the impact assessment, where the impacts on floral ecology and biodiversity are discussed.

Part C presents the results of the faunal field assessment, data analyses and discussion of the results. Part C then presents the results of the impact assessment, where the impacts on faunal ecology and biodiversity are discussed.

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APPENDIX A: Indemnity and Terms of Use of this Report

The findings, results, observations, conclusions, and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. The report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken and STS and its staff reserve the right to, at their sole discretion, modify aspects of the report including the recommendations if and when new information may become available from ongoing research or further work in this field, or pertaining to this investigation.

Although STS CC exercises due care and diligence in rendering services and preparing documents, STS CC accepts no liability and the client, by receiving this document, indemnifies STS CC and its directors, managers, agents and employees against all actions, claims, demands, losses, liabilities, costs, damages, and expenses arising from, or in connection with, services rendered, directly or indirectly by STS CC and by the use of the information contained in this document.

This report must not be altered or added to or used for any other purpose other than that for which it was produced without the prior written consent of the author(s). This also refers to electronic copies of this report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

APPENDIX B: Legislative Requirements

THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1996

The environment and the health and well-being of people are safeguarded under the Constitution of the Republic of South Africa, 1996 by way of Section 24. Section 24(a) guarantees a right to an environment that is not harmful to human health or well-being and to environmental protection for the benefit of present and future generations. Section 24(b) directs the state to take reasonable legislative and other measures to prevent pollution, promote conservation, and secure the ecologically sustainable development and use of natural resources (including water and mineral resources) while promoting justifiable economic and social development. Section 27 guarantees every person the right of access to sufficient water, and the state is obliged to take reasonable legislative and other measures within its available resources to achieve the progressive realisation of this right. Section 27 is defined as a socio-economic right and not an environmental right. However, read with Section 24 it requires of the state to ensure that water is conserved and protected and that sufficient access to the resource is provided. Water regulation in South Africa places a great emphasis on protecting the resource and on providing access to water for everyone.

THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) (NEMA)

The National Environmental Management Act, 1998 (Act No.107 of 1998) (NEMA) and the associated Environmental Impact Assessment (EIA) Regulations (GN R326 as amended in 2017 and well as listing notices 1, 2 and 3 (GN R327, R325 and R324 of 2017), state that prior to any development taking place which triggers any activity as listed within the abovementioned regulations, an environmental authorisation process needs to be followed and environmental authorisation obtained. This could follow either the Basic Assessment process or the Environmental Impact Assessment process depending on the nature of the activity and scale of the anticipated impacts

THE NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT, 2004 (ACT NO. 10 OF 2004) (NEMBA)

The objectives of this act are (within the framework of NEMA) to provide for:

- The management and conservation of biological diversity within the Republic of South Africa and of the components of such diversity;
- The use of indigenous biological resources in a sustainable manner;
- The fair and equitable sharing among stakeholders of the benefits arising from bio prospecting involving indigenous biological resources;
- To give effect to ratify international agreements relating to biodiversity which are binding to the Republic;
- To provide for cooperative governance in biodiversity management and conservation; and
- To provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act.

This act alludes to the fact that management of biodiversity must take place to ensure that the biodiversity of the surrounding areas are not negatively impacted upon, by any activity being undertaken, in order to ensure the fair and equitable sharing among stakeholders of the benefits arising from indigenous biological resources.

Furthermore, a person June not carry out a restricted activity involving either:

a) A specimen of a listed threatened or protected species;
b) Specimens of an alien species; or
c) A specimen of a listed invasive species without a permit.

GOVERNMENT NOTICE NUMBER R.1020: ALIEN AND INVASIVE SPECIES REGULATIONS, 2020 (IN GOVERNMENT GAZETTE 43735), INCLUDING GOVERNMENT NOTICE NUMBER 1003: ALIEN AND INVASIVE SPECIES LISTS, 2020 (IN GOVERNMENT GAZETTE 43726) AS IT RELATES TO THE NEMBA

NEMBA is administered by the Department of Environmental Affairs and aims to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA. This act in terms of alien and invasive species aims to:

- Prevent the unauthorised introduction and spread of alien and invasive species to ecosystems and habitats where they do not naturally occur;
- Manage and control alien and invasive species, to prevent or minimize harm to the environment and biodiversity; and
- Eradicate alien species and invasive species from ecosystems and habitats where they June harm such ecosystems or habitats.

Alien species are defined, in terms of the NEMBA as:

(a) A species that is not an indigenous species; or
(b) An indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention.

Categories according to NEMBA (Alien and Invasive Species Regulations, 2017):

- **Category 1a:** Invasive species that require compulsory control;
- **Category 1b:** Invasive species that require control by means of an invasive species management programme;
- **Category 2:** Commercially used plants that June be grown in demarcated areas, if there is a permit and that steps are taken to prevent their spread; and
- **Category 3:** Ornamentally used plants that June no longer be planted.

THE CONSERVATION OF AGRICULTURAL RESOURCES ACT, 1983 (ACT NO. 43 OF 1983) (CARA)

Removal of the alien and weed species encountered in the application area must take place in order to comply with existing legislation (amendments to the regulations under the CARA, 1983 and Section 28 of the NEMA, 1998). Removal of AIP and weed species should take place throughout the construction and operation, phases in line with an approved AIP Management Plan.

THE NATIONAL FOREST ACT, 1998 (ACT NO. 10 OF 1998) (NFA)

According to the department of Department of Environment, Forestry and Fisheries (DEFF) (previously the Department of Agriculture, Forestry and Fisheries (DAFF)) ©2019 website (https://www.daff.gov.za/daffweb3/):
"In terms of the National Forests Act of 1998 certain tree species (types of trees) can be identified and declared as protected. The Department of Water Affairs and Forestry followed an objective, scientific and participative process to arrive at the new list of protected tree species, enacted in 2004. All trees occurring in natural forests are also protected in terms of the Act. Protective actions take place within the framework of the Act as well as national policy and guidelines. Trees are protected for a variety of reasons, and some species require strict protection while others require control over harvesting and utilization."

Applicable sections of the NFA pertaining to the proposed project include the below:

Section 12:

Declaration of trees as protected

1) The Minister June declare-
    a. particular tree,
    b. a particular group of trees,
    c. a particular woodland; or
    d. trees belonging to a particular species,

to be a protected tree, group of trees, woodland or species.

2) The Minister June make such a declaration only if he or she is of the opinion that the tree, group of trees, woodland or species is not already adequately protected in terms of other legislation.
3) In exercising a discretion in terms of this section, the Minister must consider the principles set out in section 3(3) of the NFA.

Section 15(1):
No person June cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a licence granted by the Minister or in terms of an exemption from the provisions of this subsection published by the Minister in the Gazette.

Contravention of this declaration is regarded as a first category offence that June result in a person who is found guilty of being sentenced to a fine or imprisonment for a period up to three years, or both a fine and imprisonment.

THE NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT 57 OF 2003 (NEMPAA)

In order to prescribe a national framework for the declaration and management of protected areas, the NEMPAA was created to:

- To provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes;
  - For the establishment of a national register of all national, provincial and local protected areas;
  - For the management of those areas in accordance with national norms and standards;
  - For intergovernmental co-operation and public consultation in matters concerning protected areas; and
  - For matters in connection therewith;
- Provide for cooperative governance with regard to declaration and management of protected areas;
- Effect a national system of protected areas as part of a strategy to manage biodiversity
- Promote a representative network of protected areas, which are effectively managed;
- Promote sustainable use of protected areas for the benefit of all (bring about coexistence with other land uses);
- Promote the participation of local communities; and
- Provide for the continued existence of SANParks.

NATURE AND ENVIRONMENTAL CONSERVATION ORDINANCE NO. 19 OF 1974

Ordinance to consolidate and amend the laws relating to nature conservation and to provide for matters incidental thereto. This ordinance is divided as follows:

- Chapter I Definitions and Establishment of Department of Nature and Environmental Conservation and Advisory Committee (sections 2—5);
- Chapter II Nature Reserves (sections 6—15);
- Chapter III Miscellaneous Conservation Measures (sections 16—25);
- Chapter IV Protection of Wild Animals other than Fish (sections 25A-47);
- Chapter IVA Protection of Rhinoceroses (section 47A). (Item added by par. 1 Proc. 39 of 1991);
- Chapter V Protection of Fish in Inland Waters (sections 48—61A). (Substituted by s. 1 of Ord. 15 of 1983);
- Chapter VI Protection of Flora (sections 62—72);
- Chapter VIA Professional Hunters and Hunting Contractors (section 72A-72E;
- Chapter VII General and Supplementary (sections 73—90). Schedule 1 Endangered Wild Animals. Schedule 2 Protected Wild Animals;
- Schedule 3 Endangered Flora;
- Schedule 4 Protected Flora;
- Schedule 5 Noxious Aquatic Growths.; and
- Schedule 6 Ordinances Repealed.

APPENDIX C: Impact Assessment Methodology

CRITERIA	CATEGORY	DESCRIPTION	
Project phase	Construction		
	Operation		
	Decommissioning		
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts	
	Medium	Mitigation exists and will notably reduce significance of impacts	
	High	Mitigation exists and will considerably reduce the significance of impacts	
Nature	Positive		1
	Negative		-1
Duration	Immediate	Impact will self-remedy immediately	1
	Brief	Impact will not last longer than 1 year	2
	Short term	impact will last between 1 and 5 years	3
	Medium term	Impact will last between 5 and 10 years	4
	Long term	Impact will last between 10 and 15 years	5
	On-going	Impact will last between 15 and 20 years	6
	Permanent	Impact may be permanent, or in excess of 20 years	7
Extent	Very limited	Limited to specific isolated parts of the site	1
	Limited	Limited to the site and its immediate surroundings	2
	Local	Extending across the site and to nearby settlements	3
	Municipal area	Impacts felt at a municipal level	4
	Regional	Impacts felt at a regional / provincial level	5
	National	Impacts felt at a national level	6
	International	Impacts felt at an international level	7
Intensity	Negligible	Natural and/ or social functions and/ or processes are negligibly altered	1
	Very low	Natural and/ or social functions and/ or processes are slightly altered	2
	Low	Natural and/ or social functions and/ or processes are somewhat altered	3
	Moderate	Natural and/ or social functions and/ or processes are moderately altered	4
	High	Natural and/ or social functions and/ or processes are notably altered	5
	Very high	Natural and/ or social functions and/ or processes are majorly altered	6
	Extremely high	Natural and/ or social functions and/ or processes are severely altered	7
Probability	Highly unlikely / none	Expected never to happen	1
	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere	2
	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur	3
	Probable	The impact has occurred here or elsewhere and could therefore occur	4
	Likely	The impact may occur	5
	Almost certain / Highly probable	It is most likely that the impact will occur	6
	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	7
Confidence	Low	Judgement is based on intuition	
	Medium	Determination is based on common sense and general knowledge	

	High	Substantive supportive data exists to verify the assessment	
Reversibility	**Low**	The affected environment will not be able to recover from the impact - permanently modified	
	Medium	The affected environment will only recover from the impact with significant intervention	
	High	The affected environmental will be able to recover from the impact	
Resource irreplaceability	**Low**	The resource is not damaged irreparably or is not scarce	
	Medium	The resource is damaged irreparably but is represented elsewhere	
	High	The resource is irreparably damaged and is not represented elsewhere	
Significance	**Negligible**		
	Minor		
	Moderate		
	Major		

Significance:	negative	positive
Negligible	Negligible - negative	Negligible - positive
Minor	Minor - negative	Minor - positive
Moderate	Moderate - negative	Moderate - positive
Major	Major - negative	Major - positive

Mitigation measure development

The following points presents the key concepts considered in the development of mitigation measures for the proposed construction:

- Mitigation and performance improvement measures and actions that address the risks and impacts[6] are identified and described in as much detail as possible. Mitigating measures are investigated according to the impact minimisation hierarchy as follows:
- Avoidance or prevention of impact;
- Minimisation of impact; and
- Rehabilitation.
- Measures and actions to address negative impacts will favour avoidance and prevention over minimisation, mitigation or compensation; and
- Desired outcomes are defined and have been developed in such a way as to be measurable events with performance indicators, targets and acceptable criteria that can be tracked over defined periods, wherever possible.

Recommendations

Recommendations were developed to address and mitigate impacts associated with the proposed projects. These recommendations also include general management measures which apply to the proposed projects as a whole. Mitigation measures have been developed to address issues in all phases throughout the life of the projects from planning, through to construction and operation.

[6] Mitigation measures should address both positive and negative impacts

APPENDIX D: Vegetation Types

Albany Alluvial Vegetation (Aza 6)

Table D1: Dominant & typical floristic species of the Albany Alluvial Vegetation (Mucina & Rutherford, 2018 and SANBI 2006–2018)

GROUP	SPECIES
Woody Species (Riparian Thickets)	
Small Trees	*Vachellia natalitia (d), Salix mucronata* subsp.*mucronata (d), Schotia afra* var. *afra (d), Senegalia caffra, Searsia longispina.*
Succulent Trees	*Aloe africana, A. ferox.*
Tall Shrubs	*Azima tetracantha, Cadaba aphylla.*
Low Shrubs	*Pentzia incana (d), Asparagus striatus, A. suaveolens, Carissa haematocarpa.*
Succulent Shrubs	*Amphiglossa callunoides, Lycium cinereum.*
Herbaceous species (Riparian Thickets)	
Graminoids	*Sporobolus nitens (d), Digitaria eriantha, Eragrostis curvula, E. obtusa.*
Reed Beds	
Megagraminoids	*Cyperus papyrus (d), Phragmites australis*
Flooded Grasslands and Herblands	
Succulent Shrubs	*Cotyledon campanulata*[B], *Glottiphyllum longum*B, *Malephora lutea*[B], *M. uitenhagensis*[B.]
Semi Parasitic Shrubs	*Thesium junceum*[B]
Succulent Herbs	*Haworthia sordida var. sordida*[B], *Orbea pulchella*[B]
Herbs	*Rorippa fluviatilis* var. *fluviatilis.*
Graminoids	*Cynodon dactylon*[B]

***(d) – Dominant species for the vegetation type.**

Grassridge Bontveld (AT 39)

Table D2: Dominant & typical floristic species of the Grassridge Bontveld (Mucina & Rutherford, 2018 and SANBI 2006–2018)

GROUP	SPECIES
Woody Species	
Small trees	*Schotia afra (d), Sideroxylon inerme (d)*
Succulent trees	*Aloe africana (e), Aloe ferox (d)*
Tall shrubs	*Euclea undulata (d), Euclea racemosa (d), Carissa bispinosa subsp. bispinosa (d), Dovyalis caffra, Ehretia rigida, Euclea crispa, Gymnosporia capitata (e), Hippobromus pauciflorus, Maerua cafra, Mystroxylon aethiopicum subsp. aethiopicum (d), Pterocelastrus tricuspidatus (d), Putterlickia pyracantha (d), Scutia myrtina, Searsia lucida, Searsia pyroides, Searsia pterota (d)*
Low shrubs	*Helichrysum anomalum* (d), *Jamesbrittenia microphylla* (d, e), *Tephrosia capensis* (d), *Acmadenia obtusata* (e), *Agathosma capensis* (e), *Asparagus falcatus, Asparagus multiflorus* (e), *Asparagus striatus* (e), *Blepharis capensis* (e), *Chascanum cuneifolium* (e), *Clutia daphnoides* (e), *Dischoriste setigera, Disparago tortilis* (e), *Felicia muricata, Hermannia althaeoides* (e), *Hermannia flammea* (e), *Hermannia holosericea* (e), *Lantana rugosa, Limeum aethiopicum, Lobostemon trigonus* (e), *Muraltia squarrosa* (e), *Osteospermum polygaloides, Passerina rubra* (e), *Wahlenbergia tenella* (e), *Euryops ericifolius* (e), *Syncarpha recurvata* (d)
Succulent shrubs	*Crassula expansa (d), Ruschia uncinata (d), Carpobrotus edulis, Crassula capitella, Crassula ericoides (e), Crassula perfoliata, Crassula perforata, Crassula tetragona (e), Euphorbia globosa (e), Rhombophyllum rhomboideum (e)*
Leaf-succulent dwarf shrubs	*Zygophyllum divaricatum (e)*
Semi-parasitic shrubs	*Colpoon compressum (d)*
Woody climbers	*Asparagus aethiopicus, Jasminum angulare, Rhoiacarpos capensis (e), Rhoicissus digitata*
Woody succulent climbers	*Cynanchum viminale*
Herbaceous species	
Herbs	*Aizoon rigidum (d, e), Chaenostoma campanulata (d), Gazania krebsiana (d), Hypoestes aristata (d), Indigastrum costatum subsp. macrum (d), Senecio burchellii (d, e), Arctotheca calendula, Berkheya heterophylla (e), Hibiscus pusillus, Lotononis glabra, Monsonia emarginata (e), Scabiosa albanensis (e)*
Geophytic herbs	*Sansevieria hyacinthoides (d), Bulbine favosa, Bulbine inamarxiae, Moraea pallida, Oxalis smithiana, Ledebouria coriacea (e)*
Herbaceous climbers	*Kedrostis nana, Pelargonium peltatum (e)*
Graminoids	
Grasses	*Aristida diffusa (d), Cynodon dactylon (d), Cynodon incompletus (d), Eustachys paspaloides (d), Heteropogon contortus (d), Panicum maximum (d), Setaria sphacelata (d), Stipa dregeana (d), Tenaxia disticha (d), Themeda triandra (d), Cymbopogon marginatus, Cymbopogon pospischilii, Digitaria argyrograpta, Digitaria natalensis, Ehrharta calycina, Ehrharta erecta, Eragrostis capensis, Eragrostis curvula, Eragrostis obtusa, Ficinia truncata (e), Helictotrichon capense (e), Melica racemosa, Panicum deustum, Pentameris pallida, Sporobolus ioclados*

***(d) – Dominant species for the vegetation type; (e) – South African endemic**

Sundays Arid Thicket (AT 49)

Table D3: Dominant & typical floristic species of the Sundays Arid Thicket (Mucina & Rutherford, 2018 and SANBI 2006–2018)

GROUP	SPECIES
Woody Species	
Small trees	*Pappea capensis (d), Boscia oleoides (d), Euclea undulata, Schotia afra, Vachellia karroo*
Succulent trees	*Aloe ferox (d), Aloe speciosa (d, e)*
Epiphytic parasitic shrubs	*Viscum rotundifolium*
Tall shrubs	*Grewia robusta (d, e), Gymnosporia polyacantha (d, e), Searsia longispina (d, e) Azima tetracantha, Cadaba aphylla, Carissa bispinosa, Diospyros austroafricana, Gymnosporia capitata (e), Nymania capensis, Putterlickia pyracantha (e)*
Low shrubs	*Blepharis capensis (d, e), Lycium cinereum (d), Lycium oxycarpum (d, e), Pentzia incana (d), Rhigozum obovatum (d), Aptosimum elongatum, Asparagus burchellii (e), Asparagus crassicladus (e), Asparagus striatus (e), Asparagus suaveolens, Asparagus subulatus (e), Barleria pungens (e), Chrysocoma ciliata, Eriocephalus ericoides, Felicia filifolia (e), Felicia muricata, Flueggea verrucose,(e), Garuleum latifolium (e), Helichrysum rosum, Hermannia althaeoides, Hermannia gracilis (e), Indigofera sessilifolia, Lantana rugosa, Leonotis pentadentata, Lepidium africanum, Limeum aethiopicum, Justicia spartioides, Pelargonium aridum, Phymaspermum parvifolium (e), Rosenia humilis, Selago albida, Solanum tomentosum (e).*
Succulent shrubs	*Euphorbia radyeri (d), Crassula ovata (d, e), Portulacaria afra (d), Aloe striata (e), Cotyledon campanulata (e), Cotyledon orbiculata, Cotyledon velutina (e), Crassula corallina subsp. corallina, Delosperma frutescens (e), Drosanthemum lique (e), Euphorbia esculenta (e), Euphorbia mauritanica, Euphorbia pentagona (e), Mestoklema tuberosum (e), Pachypodium succulentum (e), Trichodiadema barbatum (e)*
Woody succulent climber	*Cynanchum viminale*
Woody climber	*Asparagus racemosus*
Herbaceous species	
Herbs	*Aizoon glinoides (d), Gazania krebsiana (d), Abutilon sonneratianum, Boerhavia diffusa, Euphorbia inaequilatera , Cucumis myriocarpus, Hermannia cernua, Hermannia pulverata (e), Hibiscus pusillus, Indigastrum costatum subsp. macrum, Indigofera disticha (e), Isoglossa ciliata, Lessertia pauciflora, Leysera tenella, Leobordea divaricata*
Succulent herbs	*Mesembryanthemum aitonis (d, e), Crassula muscosa, Curio radicans, Gasteria bicolor, Mesembryanthemum crystallinum*
Geophytic herbs	*Drimia intricata, Drimia anomala (e), Moraea polystachya, Oxalis stellata, Sansevieria aethiopica, Tritonia laxifolia*
Herbaceous climbers	*Cissampelos capensis, Cynanchum ellipticum, Cynanchum gerrardii, Cyphia sylvatica (e), Kedrostis nana (e), Rhoicissus digitata*
Graminoids	
Grasses	*Aristida adscensionis (d), Aristida congesta (d), Cenchrus ciliaris (d), Cynodon incompletus (d, e), Ehrharta erecta (d), Eragrostis obtusa (d), Tragus berteronianus (d), Aristida congesta, Aristida diffusa, Chloris virgata, Cynodon dactylon, Digitaria argyrograpta, Ehrharta calycina, Enneapogon desvauxii, Eragrostis chloromelas, Eragrostis curvula, Eragrostis lehmanniana, Fingerhuthia africana, Heteropogon contortus, Oropetium capense, Panicum coloratum, Panicum deustum, Panicum maximum, Setaria verticillata, Sporobolus fimbriatus, Tragus racemosus*

***(d) – Dominant species for the vegetation type; (e) – South African endemic**

Sundays Valley Thicket (AT 51)

Table D4: Dominant & typical floristic species of the Sundays Valley Thicket (Mucina & Rutherford, 2018 and SANBI 2006–2018)

GROUP	SPECIES
Woody Species	
Small trees	*Euclea undulata (d), Pappea capensis (d), Schotia afra (d), Cussonia gamtoosensis (e), Cussonia spicata, Encephalartos lehmannii (e), Ptaeroxylon obliquum, Sideroxylon inerme*
Succulent trees	*Aloe africana (d, e), Aloe ferox, Aloe speciosa (d), Euphorbia grandidens*
Epiphytic parasitic shrubs	*Viscum rotundifolium*
Semi-parasitic shrubs	*Colpoon compressum*
Tall shrubs	*Azima tetracantha, Brachylaena ilicifolia, Cadaba aphylla, Capparis sepiaria var. citrifolia, Carissa bispinosa, Ehretia rigida, Gymnosporia capitata (e), Gymnosporia polyacantha (e), Maerua cafra, Mystroxylon aethiopicum, Nymania capensis, Plumbago auriculata, Putterlickia pyracantha (e), Searsia longispina (e), Scutia myrtina*
Low shrubs	*Asparagus crassicladus (e), Asparagus striatus (e), Asparagus subulatus (e), Barleria obtusa, Chascanum cuneifolium (e), Chrysocoma ciliata, Felicia muricata, Hermannia althaeoides (e), Justicia cuneata, Justicia orchioides (e), Lantana rugosa, Leonotis pentadentata, Limeum aethiopicum, Osteospermum imbricatum (e), Rhoiacarpos capensi (e)s, Senecio linifolius, Solanum tomentosum (e)*
Succulent shrubs	*Portulacaria afra (d), Euphorbia caerulescens (d), Adromischus cristatus var. cristatus (e), Adromischus sphenophyllu (e)s, Bulbine frutescens, Cotyledon orbiculata, Cotyledon velutina (e), Crassula capitella subsp. capitella (e), Crassula capitella subsp. thyrsiflora (e), Crassula cordata (e), Crassula cultrata (e), Crassula mesembryanthemoides (e), Crassula ovata (e), Crassula perfoliata var. coccinea (e), Crassula rogersii (e), Delosperma echinatum (e), Delosperma uniflorum (e), Euphorbia mauritanica, Exomis microphylla (e), Gasteria bicolor, Kalanchoe rotundifolia, Lampranthus productus (e), Mestoklema tuberosum (e), Pachypodium bispinosum (e), Pachypodium succulentum (e), Pelargonium carnosum, Mesembryanthemum articulatum, Roepera foetida, Rhigozum obovatum (d)*
Woody succulent climbers	*Cynanchum viminale, Crassula perforata*
Woody climber	*Asparagus aethiopicus, Asparagus asparagoides, Asparagus multiflorus (e), Asparagus volubilis (e)*
Herbaceous species	
Herbs	*Abutilon sonneratianum, Aizoon glinoides (e), Arctotheca calendula, Commelina benghalensis, Cyanotis speciosa, Emex australis, Gazania krebsiana, Hibiscus pusillus, Hypoestes aristata, Lepidium africanum, Lotononis glabra (e), Plectranthus madagascariensis, Stachys aethiopica*
Succulent herbs	*Curio radicans (d), Crassula expansa, Crassula spathulata (e)*
Geophytic herbs	*Sansevieria hyacinthoides (d), Sansevieria aethiopica, Cyanella lutea, Cyrtanthus loddigesianus (e), Drimia altissima, Drimia anomala (e), Drimia intricata, Freesia corymbosa (e), Hypoxis argentea, Oxalis smithiana, Trachyandra affinis (e), Tritonia securigera (e)*
Herbaceous climbers	*Pelargonium peltatum (d, e), Cissampelos capensis, Cynanchum ellipticum, Cyphostemma quinatum, Jasminum angulare, Kedrostis capensis, Rhoicissus digitata, Rhoicissus tridentata*
Graminoids	
Grasses	*Cynodon dactylon (d), Eragrostis obtusa (d), Panicum maximum (d), Eragrostis curvula, Eustachys paspaloides, Panicum deustum, Sporobolus fimbriatus, Stipa dregeana, Themeda triandra*

***(d) – Dominant species for the vegetation type; (e) – South African endemic**

APPENDIX E: Details, Expertise And Curriculum Vitae of Specialists

1. (a) (i) Details of the specialist who prepared the report

Christopher Hooton	BTech Nature Conservation (Tshwane University of Technology)
Charne Gouws	MSc. Plant Science (University of Pretoria);
Christien Steyn	MSc. Plant Science (University of Pretoria)
Paige van Niekerk	BSc (Hons) Animal, Plant and Environmental Sciences (University of the Witwatersrand)
Kim Marais	BSc (Hons) Zoology (Herpetology) (University of the Witwatersrand);
Nelanie Cloete	MSc Botany and Environmental Management (University of Johannesburg)

1. (A). (ii) The expertise of that specialist to compile a specialist report including a curriculum vitae

Company of Specialist:	Scientific Terrestrial Services		
Name / Contact person:	Christien Steyn		
Postal address:	PO. Box 751779, Gardenview		
Postal code:	2047	Fax:	086 724 3132
Telephone:	011 616 7893		
E-mail:	christien@sasenvgroup.co.za		
Qualifications	MSc (Plant Science) (University of Pretoria) BSc (Hons) Plant Science (Invasion Biology) (University of Pretoria) BSc Environmental Science (University of Pretoria)		
Registration / Associations	Member of the South African Association of Botanists (SAAB) Member of the Botanical Society of South Africa (BotSoc) Professional member of the South African Council for Natural Scientific Professions (SACNASP) Member of the Grassland Society of South Africa (GSSA) Member of the Land Rehabilitation Society of Southern Africa (LARSSA)		

Company of Specialist:	Scientific Terrestrial Services		
Name / Contact person:	Nelanie Cloete		
Postal address:	PO. Box 751779, Gardenview		
Postal code:	2047	Fax:	086 724 3132
Telephone:	011 616 7893		
E-mail:	Nelanie@sasenvgroup.co.za		
Qualifications	MSc Environmental Management (University of Johannesburg) MSc Botany (University of Johannesburg) BSc (Hons) Botany (University of Johannesburg) BSc (Botany and Zoology) (Rand Afrikaans University)		
Registration / Associations	Professional member of the South African Council for Natural Scientific Professions (SACNASP) Member of the South African Association of Botanists (SAAB) Member of the International Affiliation for Impact Assessments (IAIAsa) South Africa group Member of the Grassland Society of South Africa (GSSA)		

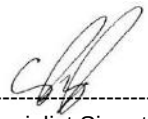
Company of Specialist:	Scientific Terrestrial Services		
Name / Contact person:	Kim Marais		
Postal address:	PO. Box 751779, Gardenview		
Postal code:	2047	Fax:	086 724 3132
Telephone:	011 616 7893		
E-mail:	kim@sasenvgroup.co.za		
Qualifications	BSc (Hons) Zoology (University of the Witwatersrand) BSc (Zoology and Conservation) (University of the Witwatersrand)		
Registration / Associations	Registered Professional Scientist at South African Council for Natural Scientific Professions (SACNASP) Member of South African Wetland Forum		

Company of Specialist:	Scientific Terrestrial Services		
Name / Contact person:	Charne Gouws		
Postal address:	PO. Box 751779, Gardenview		
Postal code:	2047	Fax:	086 724 3132
Telephone:	011 616 7893		
E-mail:	kim@sasenvgroup.co.za		
Qualifications	BSc (MSc) Plant Science (University of Pretoria) BSc (Hons) Plant Science (University of the Witwatersrand) BSc Environmental Science (University of the Witwatersrand)		

1. (b) a declaration that the specialist is independent in a form as June be specified by the competent authority

I, Christopher Hooton, declare that -

- I act as the **independent specialist (Part C author)** 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 June compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, 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 June 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.



Specialist Signature

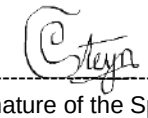
I, Charne Gouws, declare that -

- I act as the **independent specialist (Part B author)** 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 relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, 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.

Specialist Signature

I, Christien Steyn, declare that -

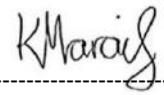
- I act as the **independent specialist (reviewer)** in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that June compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, 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 June 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



Signature of the Specialist

I, Kim Marais, declare that -

- I act as the **independent specialist (reviewer)** 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 June compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, 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 June 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



Signature of the Specialist

I, Nelanie Cloete, declare that -

- I act as the **independent specialist (reviewer)** 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 June compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, 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 June 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

Signature of the Specialist

SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

CURRICULUM VITAE OF CHRISTIEN STEYN

PERSONAL DETAILS

Position in Company	Floral Ecologist
Joined SAS Environmental Group of Companies	2018

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Professional member of the South African Council for Natural Scientific Professions (SACNASP – Reg No. 127823/21)
Member of the Botanical Society of South Africa (BotSoc)
Member of the Grassland Society of South Africa (GSSA)
Member of the Land Rehabilitation Society of Southern Africa (LARSSA)
Member of the South African Association of Botanists (SAAB)

EDUCATION

Qualifications

MSc Plant Science (University of Pretoria)	2017
BSc (Hons) Plant Science (Invasion Biology) (University of Pretoria)	2014
BSc Environmental Science (University of Pretoria)	2013

Short courses and Training

- Advanced Grass Identification Course
- Practical Plant Identification, including Herbarium Usage and Protocols
- Vegetation Classification and Mapping: Use of Geographic Information System for understanding vegetation pattern and biodiversity conservation.
- Introduction to Statistics for Biologists: Applications of plant ecology principles in plant conservation, i.e., species distribution modelling, alien plant invasions, conservation planning
- International Plant Functional Trait Course: Hands-on, field-based exploration of plant functional traits, along with experience in the usage of plant traits data in climate-change research and ecosystem ecology. https://www.uib.no/en/rg/EECRG/97477/plant-functional-traits-course-2

AREAS OF WORK EXPERIENCE

South Africa – Gauteng, Mpumalanga, North West, Limpopo, KwaZulu-Natal, Northern Cape, Free State

KEY SPECIALIST DISCIPLINES

Biodiversity Assessments

- Terrestrial Ecological and Biodiversity Scoping Assessments
- Terrestrial Ecological and Biodiversity Screening Assessments
- Floral Assessments
- Input into Terrestrial Rehabilitation Plan design with the focus on the re-establishment of vegetation
- Floral Rescue and Relocation Plans
- Alien and Invasive Plant Control and Management Plans (AIPCPs)
- Alien and Invasive Plant Identification and awareness training
- Terrestrial Monitoring
- Protected Tree and Floral Marking and Reporting
- Desktop Studies, Mapping and Background Information Research

SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

CURRICULUM VITAE OF PAIGE FRANCES VAN NIEKERK

PERSONAL DETAILS

Position in Company	Faunal Ecologist
Joined SAS Environmental Group of Companies	2020

EDUCATION

Qualifications

BSc (Hons) Animal, Plant and Environmental Sciences (University of the Witwatersrand)	2019
B.Tech Nature Conservation (Tshwane University of Technology)	2017
N. Diploma Nature Conservation (Tshwane University of Technology)	2015

AREAS OF WORK EXPERIENCE

South Africa – Gauteng, Mpumalanga, Limpopo, Kwa-Zulu Natal, North West Province and Northern Cape

KEY SPECIALIST DISCIPLINES

Terrestrial Ecological Assessments:

- Detailed Faunal Field Assessments, Fauna Ecology and Species Assemblage Reports
- Ecological Scan
- Red Data/Species of Special Concern Faunal Species Assessments
- Consulting maps, aerial photographs and digital satellite images
- Desktop studies, Mapping and General GIS
- Compilation of Impact Assessments
- Faunal Field Data Analysis and Preparation

Training

- GIS mapping in ArcGIS and Global Mapper
- Philosophy of Science
- Statistics for field biology
- Academic writing
- Advanced grass identification course with Frits Van Oudtshoorn

SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

CURRICULUM VITAE OF CHRISTOPHER HOOTON

PERSONAL DETAILS

Position in Company	Senior Scientist, Member Biodiversity Specialist
Joined SAS Environmental Group of Companies	2013

EDUCATION

Qualifications

BTech Nature Conservation (Tshwane University of Technology)	2013
National Diploma Nature Conservation (Tshwane University of Technology)	2008

AREAS OF WORK EXPERIENCE

South Africa – Gauteng, Mpumalanga, North West, Limpopo, KwaZulu-Natal, Eastern Cape, Western Cape, Northern Cape, Free State
Africa - Zimbabwe, Sierra Leone, Zambia

KEY SPECIALIST DISCIPLINES

Biodiversity Assessments

- Floral Assessments
- Faunal Assessments
- Biodiversity Actions Plan (BAP)
- Biodiversity Management Plan (BMP)
- Alien and Invasive Control Plan (AICP)
- Ecological Scan
- Protected Tree and Floral Marking and Reporting
- Biodiversity Offset Plan

Freshwater Assessments

- Freshwater Verification Assessment
- Freshwater (wetland / riparian) Delineation and Assessment
- Freshwater Eco Service and Status Determination
- Rehabilitation Assessment / Planning

SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

CURRICULUM VITAE OF KIM MARAIS

PERSONAL DETAILS

Position in Company	Senior Scientist Water Resource Manager
Joined SAS Environmental Group of Companies	2015

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Professional member of the South African Council for Natural Scientific Professions (SACNASP – Reg No. 117137/17)
Member of the Western Cape Wetland Forum (WCWF)

EDUCATION

Qualifications

BSc (Hons) Zoology (University of the Witwatersrand)	2012
BSc (Zoology and Conservation) (University of the Witwatersrand)	2011

Short Courses

Aquatic and Wetland Plant Identification (Cripsis Environment)	2019
Tools for Wetland Assessment (Rhodes University)	2018
Certificate in Environmental Law for Environmental Managers (CEM)	2014
Certificate for Introduction to Environmental Management (CEM)	2013

KEY SPECIALIST DISCIPLINES

Biodiversity Assessments

- Biodiversity Action Plans (BAP)
- Alien and Invasive Control Plans (AICP)
- Faunal Eco Scans
- Faunal Impact Assessments

Freshwater Assessments

- Desktop Freshwater Delineation
- Freshwater Verification Assessment
- Freshwater (wetland / riparian) Delineation and Assessment
- Freshwater Eco Service and Status Determination
- Rehabilitation Assessment / Planning
- Watercourse Maintenance and Management Plans
- Freshwater Offset Plan

Aquatic Ecological Assessment and Water Quality Studies

- Riparian Vegetation Integrity (VEGRAI)
- Water quality Monitoring
- Riverine Rehabilitation Plans

Legislative Requirements, Processes and Assessments

- Water Use Applications (Water Use Licence Applications / General Authorisations)
- Water Use Audits
- Freshwater Resource Management and Monitoring as part of EMPR and WUL conditions
- Public Participation processes

SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

CURRICULUM VITAE OF NELANIE CLOETE

PERSONAL DETAILS

Position in Company	Senior Scientist, Member Botanical Science and Terrestrial Ecology
Joined SAS Environmental Group of Companies	2011

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Professional member of the South African Council for Natural Scientific Professions (SACNASP – Reg No. 400503/14)
Member of the South African Association of Botanists (SAAB)
Member of the International Affiliation for Impact Assessments (IAIAsa) South Africa group
Member of the Grassland Society of South Africa (GSSA)
Member of the Botanical Society of South Africa (BotSoc)
Member of the Gauteng Wetland Forum (GWF)
Member of the South African Wetland Society (SAWS)

EDUCATION

Qualifications

MSc Environmental Management (University of Johannesburg)	2013
MSc Botany (University of Johannesburg)	2007
BSc (Hons) Botany (University of Johannesburg)	2005
BSc (Botany and Zoology) (Rand Afrikaans University)	2004

Short Courses

Certificate – Department of Environmental Science in Legal context of Environmental Management, Compliance and Enforcement (UNISA)	2009
Introduction to Project Management - Online course by the University of Adelaide	2016
Integrated Water Resource Management, the National Water Act, and Water Use Authorisations, focusing on WULAs and IWWMPs	2017
Environmental legal compliance, Monitoring and Auditing	2021

AREAS OF WORK EXPERIENCE

South Africa – Gauteng, Mpumalanga, North West, Limpopo, KwaZulu-Natal, Northern Cape, Eastern Cape, Free State
Africa - Democratic Republic of the Congo (DRC)

KEY SPECIALIST DISCIPLINES

Biodiversity Assessments

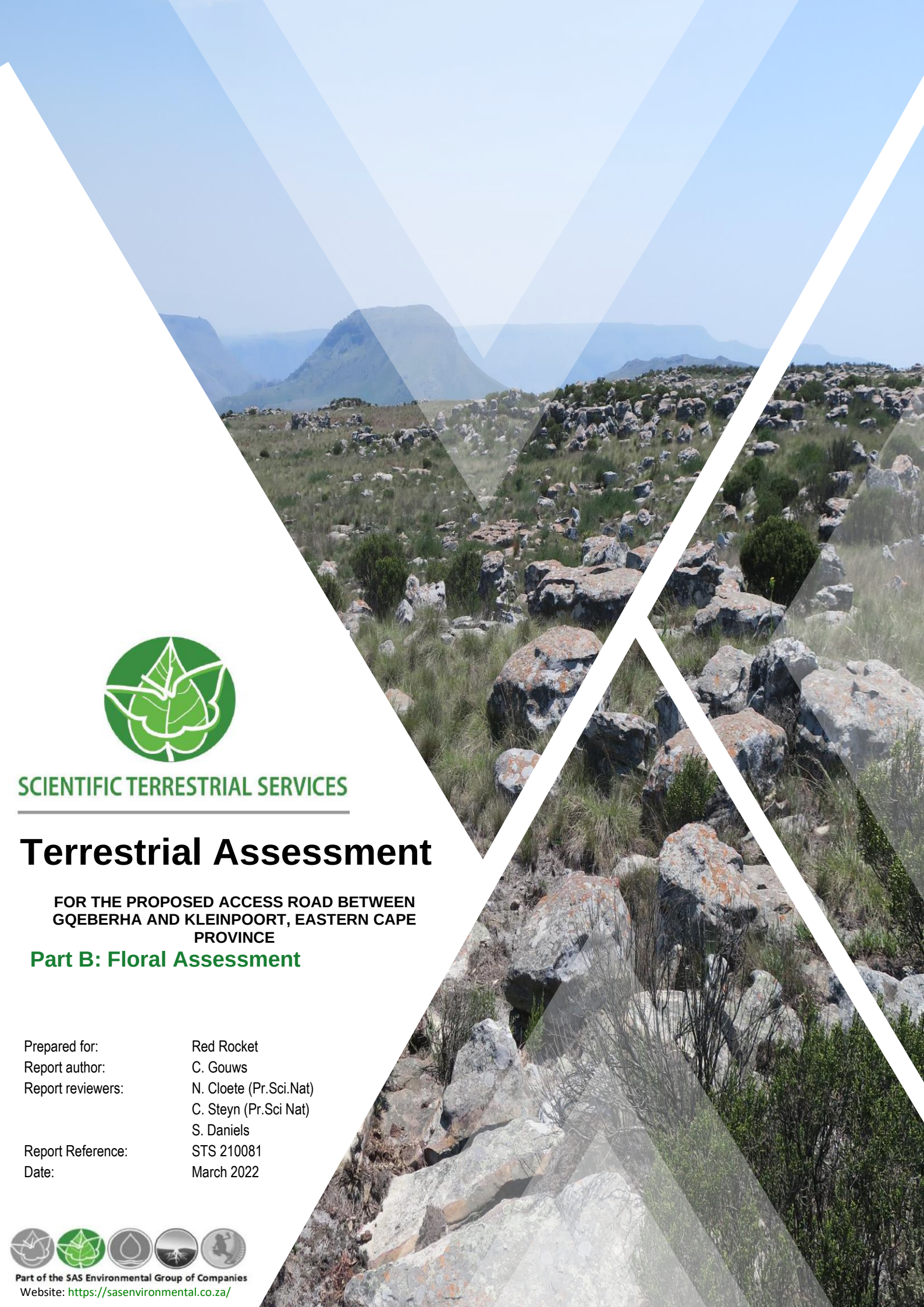
- Floral Assessments
- Biodiversity Actions Plan (BAP)
- Biodiversity Management Plan (BMP)
- Alien and Invasive Control Plan (AICP)
- Ecological Scan
- Terrestrial Monitoring
- Protected Tree and Floral Marking and Reporting
- Biodiversity Offset Plan

Freshwater Assessments

- Desktop Freshwater Delineation
- Freshwater Verification Assessment
- Freshwater (wetland / riparian) Delineation and Assessment
- Freshwater Eco Service and Status Determination
- Rehabilitation Assessment / Planning
- Plant species and Landscape Plan

Legislative Requirements, Processes and Assessments

- Water Use Applications (Water Use Licence Applications / General Authorisations)
- Environmental and Water Use Audits
- Freshwater Resource Management and Monitoring as part of EMPR and WUL conditions



SCIENTIFIC TERRESTRIAL SERVICES

Terrestrial Assessment

FOR THE PROPOSED ACCESS ROAD BETWEEN GQEBERHA AND KLEINPOORT, EASTERN CAPE PROVINCE

Part B: Floral Assessment

Prepared for:	Red Rocket
Report author:	C. Gouws
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Report Reference:	STS 210081
Date:	March 2022

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LIST OF ACRONYMS

AIP	Alien and Invasive Plant
BAP	Biodiversity Action Plan
BGIS	Biodiversity Geographic Information Systems
BLMC	Biodiversity Land Management Classes
BODATSA	Botanical Database of Southern Africa
CNECO	Cape Nature and Environmental Conservation Ordinance 19 of 1974
CBA	Critical Biodiversity Area
CR	Critically Endangered
DEA	Department of Environmental Affairs
DEDEA	Department of Finance, Economic Development, Environmental Affairs and Tourism
DENC	Department of Environment and Nature Conservation
EA	Environmental Authorities
ECBCP	Eastern Cape Biodiversity Conservation Plan
EIS	Ecological Importance and Sensitivity
ESA	Ecological Support Area
EN	Endangered
EAP	Environmental Assessment Practitioner
EA	Environmental Authorisation
ECO	Environmental Control Officer
E-GIS	Environmental Geographical Information Systems
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EW	Extinct in the Wild
GN	General Notice
GIS	Geographic Information System
GPS	Global Positioning System
Ha	Hectares
IEA	Integrated Environmental Authorisation
IUCN	International Union for Conservation of Nature
LC	Least Concern
MRAs	Mining Right Areas
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act, 2004 [Act No.10 of 2004]
NFA	National Forest Act, 1998 [Act No. 84 of 1998]
NWA	National Water Act, 1998 [Act No. 36 of 1998]
OHPL	Overhead Power Line
POSA	Plants of Southern Africa
POC	Potential of Occurrence
PES	Present Ecological State
PP	Problem Plant
QDS	Quarter Degree Square
RDL	Red Data Listed
STEP	Subtropical Thicket Ecosystem Programme
STS	Scientific Terrestrial Services
SANBI	South African National Biodiversity Institute
SCC	Species of Conservation Concern
SS	Sensitive Species
TOPS	Threatened or Protected Species
VU	Vulnerable

GLOSSARY OF TERMS

Most definitions are based on terms and concepts elaborated by Richardson *et* al. (2011), Hui and Richardson (2017), Wilson *et* al. (2017) and Skowno et al. (2019), with consideration to their applicability in the South African context, especially South African legislation [notably the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), and the associated Alien and Invasive Species Regulations, 2020].

Alien species (syn. exotic species; non-native)	A species that is present in a region outside its natural range due to human actions (intentional or accidental) that have enabled it to overcome biogeographic barriers.
Biodiversity priority areas	Features in the landscape or seascape that are important for conserving a representative sample of ecosystems and species, for maintaining ecological processes, or for the provision of ecosystem services. They include the following categories, most of which are identified based on systematic biodiversity planning principles and methods: Protected Areas, Critically Endangered and Endangered ecosystems, Critical Biodiversity Areas and Ecological Support Areas, Freshwater Ecosystem Priority Areas, high water yield areas, flagship free-flowing rivers, priority estuaries, Investigation Areas for land-based protected area expansion, and Investigation Areas for offshore protection. Marine ecosystem priority areas and coastal ecosystem priority areas have yet to be identified but will be included in future. The different categories *are not mutually exclusive* and, in some cases, overlap, often because a particular area or site is important for more than one reason. They should be *complementary*, with overlaps *reinforcing the importance* of an area.
Biological diversity or Biodiversity (as per the definition in NEMBA[1])	The variability among living organisms from all sources including, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems.
Biome - as per Mucina and Rutherford (2006); after Low and Rebelo (1998).	A broad ecological spatial unit representing major life zones of large natural areas – defined mainly by vegetation structure, climate, and major large-scale disturbance factors (such as fires).
Bioregion (as per the definition in NEMBA)	A geographic region which has in terms of section 40(1) been determined as a bioregion for the purposes of this Act;
Critical Biodiversity Area (CBA)	A CBA is an area considered important for the survival of threatened species and includes valuable ecosystems such as wetlands, untransformed vegetation and ridges.
Corridor	A dispersal route or a physical connection of suitable habitats linking previously unconnected regions.
Critically Endangered (CR) (IUCN[2] Red List category)	**Applied to both species/taxa and ecosystems**: A species is CR when the best available evidence indicates that it meets at least one of the five IUCN criteria for CR, indicating that the species is facing an extremely high risk of extinction. CR ecosystem types are at an extremely high risk of collapse. Most of the ecosystem type has been severely or moderately modified from its natural state. The ecosystem type is likely to have lost much of its natural structure and functioning, and species associated with the ecosystem may have been lost. CR species are those considered to be at extremely high risk of extinction.
Degradation	The many human-caused processes that drive the decline or loss in biodiversity, ecosystem functions or ecosystem services in any terrestrial and associated aquatic ecosystems.
Disturbance	A temporal change, either regular or irregular (uncertain), in the environmental conditions that can trigger population fluctuations and

[1] The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA)
[2] International Union for Conservation of Nature (IUCN)

	secondary succession. Disturbance is an important driver of biological invasions.
Driver (ecological)	A driver is any natural or human-induced factor that directly or indirectly causes a change in ecosystem. A direct driver clearly influences ecosystem processes, where indirect driver influences ecosystem processes through altering one or more direct drivers.
Endangered (EN) (IUCN Red List category)	**Applied to both species/taxa and ecosystems**: A species is EN when the best available evidence indicates that it meets at least one of the five IUCN criteria for EN, indicating that the species is facing a very high risk of extinction. EN ecosystem types are at a very high risk of collapse. EN species are those considered to be at very high risk of extinction.
Endemic species	Species that are only found within a pre-defined area. There can therefore be sub-continental (e.g., southern Africa), national (South Africa), provincial, regional, or even within a particular mountain range.
Ground·Truth	To check the accuracy of remotely sensed data (i.e., the desktop databases used in Part A) by means of in-situ, "on the ground" observations.
Habitat (as per the definition in NEMBA)	A place where a species or ecological community naturally occurs.
Indigenous vegetation (as per the definition in NEMA[3])	Vegetation occurring naturally within a defined area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.
Integrity (ecological)	The integrity of an ecosystem refers to its functional completeness, including its components (species) its patterns (distribution) and its processes.
Invasive species	Alien species that sustain self-replacing populations over several life cycles, produce reproductive offspring, often in very large numbers at considerable distances from the parent and/or site of introduction, and have the potential to spread over long distances.
Listed alien species	All alien species that are regulated in South Africa under the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004), Alien and Invasive Species Regulations, 2020.
Least Threatened	Least threatened ecosystems are still largely intact.
Native species (syn. indigenous species)	Species that are found within their natural range where they have evolved without human intervention (intentional or accidental). Also includes species that have expanded their range as a result of human modification of the environment that does not directly impact dispersal (e.g., species are still native if they increase their range as a result of watered gardens but are alien if they increase their range as a result of spread along human-created corridors linking previously separate biogeographic regions).
Red Data Listed (RDL) species	According to the Red List of South African plants (http://redlist.sanbi.org/) and the IUCN, organisms that fall into the Extinct in the Wild (EW), CR, EN, Vulnerable (VU) categories of ecological status.
Species of Conservation Concern (SCC)	The term SCC in the context of this report refers to all RDL and IUCN listed threatened species as well as protected species of relevance to the project.
Threatened ecosystem	An ecosystem that has been classified as CR, EN or VU, based on an analysis of ecosystem threat status. A threatened ecosystem has lost or is losing vital aspects of its structure, function, or composition. The NEMBA allows the Minister of Environmental Affairs or a provincial MEC for Environmental Affairs to publish a list of threatened ecosystems. To date, threatened ecosystems have been listed only in the terrestrial environment. In cases where no list has yet been published by the Minister, such as for all aquatic ecosystems, the ecosystem threat status assessment in the National Biodiversity Assessment (NBA) can be used as an interim list in planning and decision making.

[3] National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)

Threatened species	A species that has been classified as CR, EN or VU, based on a conservation assessment (Red List), using a standard set of criteria developed by the IUCN for determining the likelihood of a species becoming extinct. A threatened species faces a high risk of extinction in the near future.
Vulnerable (VU) (Red List category)	**Applied to both species/taxa and ecosystems**: A species is VU when the best available evidence indicates that it meets at least one of the five IUCN criteria for VU, indicating that the species is facing a high risk of extinction. An ecosystem type is VU when the best available evidence indicates that it meets any of the criteria A to E for VU and is then considered to be at a high risk of collapse.

1 INTRODUCTION

1.1 Background

Scientific Terrestrial Services CC (STS) was appointed by Red Rocket (Pty) Ltd to conduct a terrestrial biodiversity assessment as part of the Environmental Authorisation (EA) process for the proposed overhead powerline (OHPL), between Qqeberha and Kleinpoort, from Grassridge Substation to Wolf Substation in the Eastern Cape province. A 100 m buffer (50 metres on either side of the proposed OHPL) to account for edge effects was investigated by the specialists. The proposed OHPL and 100 m buffer will henceforth be collectively referred to as the **"investigation area".**

An existing 132 kV transmission line runs between the Wolf and Skilpad substations (approximately 46 km long) and Skilpad to Grassridge substations (approximately 44 km long) and is located north of Kariega and West of Kirkwood. The line runs from the Grassridge substation in a general north-westerly direction to the Skilpad- and Wolf substation and is approximately 90 km in length. This impact assessment is for the construction of a new Wolf-Skilpad-Grassridge 132 kV transmission line adjacent to the existing line. A 100 m buffer (50 m on either side of the proposed and alternative OHPL) to account for edge effects was investigated by the specialists. The proposed OHPL and 100 m buffer will henceforth be collectively referred to as the "**Investigation Area**". The extent and layouts of the Investigation Area are depicted in Figure 1 below.

The purpose of this report is to define the floral ecology associated with the Investigation Area, to identify areas of increased Ecological Importance and Sensitivity (EIS), as well as the mapping of such areas, and to describe the Present Ecological State (PES) of the Investigation Area. The primary objective of the floral assessment is not to compile an exhaustive species list but rather to ensure that sufficient data are collected to describe all the vegetation communities present in the area of interest, to optimise the detection of Species of Conservation Concern (SCC) and to assess habitat suitability for other potentially occurring SCC (SANBI, 2020).

This report, after consideration and the description of the ecological integrity of the Investigation Area, must guide the Environmental Assessment Practitioner (EAP), the regulatory authorities and the developing proponent by means of the presentation of the floral results and recommendations as to the ecological viability of the Investigation Area.

1.2 Scope of Work

Specific outcomes in terms of the report are as follows:

- To determine and describe habitat types, communities and the ecological state of the sites associated with the Investigation Area and to rank each habitat type based on conservation importance and ecological sensitivity;
- To provide inventories of floral species as encountered within the Investigation Area;
- To identify and consider all sensitive landscapes such as indigenous forests, rocky ridges, wetlands and/ or any other special features such as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs);
- To conduct a Red Data Listed (RDL) floral species assessment as well as an assessment of other SCC[4], including the potential for such species to occur within the Investigation Area;
- To provide detailed information to guide the activities associated with the proposed development within the Investigation Area; and
- To ensure the ongoing functioning of the ecosystem in such a way as to support local and regional conservation requirements, to allow regional and national biodiversity targets to be met, and the provision of ecological services in the local area is sustained.

1.3 Assumptions and Limitations

The following assumptions and limitations are applicable to this report:

- The floral assessment is confined to the Investigation Area and does not include the adjacent properties. The Investigation Area and immediate surroundings were, however, included in the desktop analysis of which the results are presented in **Part A: Section 3**;
- Sampling by its nature means that not all individuals are assessed and identified. With ecology being dynamic and complex, some aspects (some of which may be important) may have been overlooked. The identification was difficult for the graminoids which lacked the diagnostic characteristics (inflorescences) to make confident identification

[4] **As part of the SCC assessment, the following classes were considered:**

- **Threatened species**. In terms of Section 56(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA), threatened species are Red Data Listed (RDL) species falling into the following categories of ecological status: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Protected in terms of the NEMBA Threatened or Protected Species (TOPS) Regulations (General Notice (GN) R152 of 2007, as amended). Removal, translocation and/or destruction of these species require authorisation from the DFFE.
- **Protected Species**. Species that do not necessarily fall in the above categories of ecological status, but that are deemed important from a provincial biodiversity perspective, e.g., LEMA provides a list of Specially Protected Plants (Schedule 11) and Protected Plants (Schedule 12) for the Limpopo Province for which restricted activities may not occur without permits from the relevant provincial authorities. The List of Protected Tree Species (GN No. 536) as published in the Government Gazette 41887 dated 7 September 2018 as it relates to the NFA was also considered for the SCC assessment.

to species level due to recent drought conditions. A more comprehensive assessment would require that assessments take place in all seasons of the year. To account for seasonal limitations, on-site data was significantly augmented with all available desktop data and background research of previous studies conducted in the area (Ecological Impact Assessment prepared for Ukomeleza Wind Power (Pty) Ltd, by EOH Coastal and Environmental Services, (2016));

- The Department of Forestry, Fisheries, and the Environment's (DFFE) Screening Tool provides names of Sensitive Species likely to be present within the Investigation Area and its surrounds. Within the screening tool outcome, the names of some species are not provided. These species are rather assigned a number keeping them unidentifiable (e.g., Sensitive Species 1). This procedure is followed because of the vulnerability of the species to threats such as illegal harvesting and overexploitation. According to the best practice guidelines provided by the South African National Biodiversity Institute (SANBI), the identity of Sensitive Species **may not appear** in the final EIA (Environmental Impact Assessment report **nor any of the specialist reports** released into the public domain. However, the conservation threat status of such species has been provided; and
- Access to the Investigation Area was limited in certain sections by permission from specific landowners. Therefore, where access to a specific site was not gained, data on the relevant sections of the OHPL have been interpolated from surrounding data points. However, the accuracy of this investigation method will not be as precise as other sampling sites; these areas include vast sections of the Sundays Valley Thicket Habitat Unit and the majority of the Alternative Route.

2 ASSESSMENT APPROACH

An on-site visual investigation of the assessment area was conducted during summer (7th – 11th of February and the 22nd - 23rd of March 2022) to confirm and ground-truth the assumptions made during the consultation of the background maps and to determine whether the sensitivity of the terrestrial biodiversity associated with the assessment areas confirms the results of the online National Web-based Environmental Screening Tool ("Screening Tool" hereafter).

2.1 General Approach

The vegetation surveys are based on the subjective sampling method, which is a technique where the specialist chooses specific sample sites within the area of interest based on their professional experience in the area and background research done prior to the site visit. This

allows representative recordings of floral communities and optimal detection of SCC (refer to the methodology description in **Appendix A**).

The below list includes the steps followed during the preparation for and the conduction of the field assessments:

- To guide the selection of appropriate sample sites, background data and digital satellite images were consulted before going to site, during which broad habitats, vegetation types and potentially sensitive sites were identified. The results of these analyses were then used to focus the fieldwork on specific areas of concern and to identify areas where targeted investigations were required (e.g., for SCC detection and within the direct footprint of the proposed project);
- All relevant resources and datasets as presented by the SANBI's Biodiversity Geographic Information Systems (BGIS) website (http://bgis.sanbi.org) and the Environmental Geographical Information Systems (E-GIS) website (https://egis.environment.gov.za/), including the Cape Nature and Environmental Conservation Ordinance 19 (1974) and the Screening Tool, were consulted to gain background information on the physical habitat and potential floral diversity associated with the assessment areas;
- Based on the broad habitat units delineated before going to site and the pre-identified points of interest, which is updated based on on-site observations and access constraints, the selected sample areas were surveyed on foot, following subjective transects, to identify the occurrence of the dominant plant species and habitat diversities, but also to detect SCC which tend to be sparsely distributed. A 100 m buffer (50 metres on either side of the proposed OHPL) zone was applied around the proposed OHPL to ensure a larger site is assessed to detect possible edge effects that may arise from the proposed activities; and
- Photographs were taken of each vegetation community that is representative of typical vegetation structure of that community, as well as photos of all detected SCC (except for Sensitive Species as identified by the Screening Tool[5]).

Additional information on the method of assessment is provided in **Appendix A** of this report.

2.2 Definitions, descriptions, and taxon nomenclature

Scientific nomenclature for plant species in this report follows that of the SANBI's Red List of South African Plants Online, as it relates to the Botanical Database of Southern Africa

[5] The identity of sensitive species **may not appear** in the final EIA report **nor any of the specialist reports** released into the public domain.

(BODATSA) and BRAHMS Online. For alien species, the definitions of Richardson et al. (2011) are used. Vegetation structure is described as per Edwards (1983) (refer to Figure A1).

2.3 Sensitivity Mapping

All the ecological features of the assessment areas were considered, and sensitive areas were assessed and delineated using a Global Positioning System (GPS). A Geographic Information System (GIS) was used to project these features onto satellite imagery. The sensitivity map should assist the EAP / proponent as to the suitability of the proposed development within the assessment areas.

3 RESULTS OF FLORAL ASSESSMENT

3.1 Broad-scale vegetation characteristics

The Investigation Area is located within the Albany Alluvial Vegetation, Grassridge Bontveld, Sundays Arid Thicket and Sundays Valley Thicket vegetation types (as per Mucina and Rutherford (2006)[6] and SANBI (2006-2018)[7]), which were used as the reference vegetation types in this assessment.

The Sundays Arid Thicket vegetation type is associated with the Western side of the investigation area, which is described by Mucina and Rutherford (2006) as “Short (1 – 2 m) and dense succulent thicket with *Portulacaria afra* often dominant. Where *P. afra* is naturally uncommon, *Euphorbia radyeri* is locally dominant and the tree component (*Boscia oleoides, Euclea undulata, Pappea capensis*) is sparse. Pockets of karroid shrubland (*Pentzia incana, Rhigozum obovatum*) also occur in this thicket unit”. This vegetation type is of Least Concern (LC) and is listed as Moderately Protected (MP) (SANBI (2018a and b)).

Most of the Investigation Area is located within the remaining extent of the Sundays Valley Thicket, a vegetation type that is of LC in terms of its conservation status but has a protection level of MP (Skowno et al., 2019, SANBI (2018a and b)). Mucina and Rutherford (2006) describe the Sundays Valley Thicket as “Medium-sized to tall (3 - 5 m) dense thicket in which the woody tree and shrub component, and the succulent component, are well developed, with many spinescent species. There are no distinct strata in the vegetation as the lower and upper

[6] Mucina & Rutherford (2006) provide a synthesis of all the vegetation types found within South Africa. Within each vegetation synthesis, the general characteristics of the vegetation types is described together with an indication of dominant and./or important plant taxa within the vegetation type. These vegetation types form the basis on which the habitat units, and associated discussions, for the Study Area are based.

[7] South African National Biodiversity Institute (2006-2018). The Vegetation Map of South Africa, Lesotho, and Swaziland, Mucina, L., Rutherford, M.C. and Powrie, L.W. (Editors), Online, http://bgis.sanbi.org/Projects/Detail/186, Version 2018.

canopy species intertwine, often with a wide variety of lianas[8] linking the understorey with the canopy. Emergents are uncommon, but *Euphorbia grandidens*, *E. triangularis*, and occasionally *Cussonia gamtoosensis* and *C. spicata* emerge above the canopy. The abundance of *Portulacaria afra* and other succulent shrubs (e.g., *Aloe speciosa, Euphorbia caerulescens*) increases in more arid sites, while local soil conditions also influence the composition of the vegetation - there is thus considerable structural heterogeneity within this vegetation unit."

The Grassridge Bontveld vegetation type is located within the eastern sections of the Investigation Area near the Grassridge Substation. This vegetation type is currently listed as LC and is MP (SANBI (2018a and b)) and described as "A mosaic of low thicket (2 – 3 m) consisting of bush clumps of variable size in a matrix of low (0.2 - 0.8 m) grassy dwarf-shrubland. This unit is often restricted to 'islands' in a matrix of typical Sundays Valley Thicket. The species present within the grassy dwarf-shrubland are a mixture of Fynbos, Grassland and Karroid elements, with *Themeda triandra* often dominant" (Mucina and Rutherford, 2006).

From the desktop analysis (refer to Part A for further details) the Investigation Area further occurs within the Albany Alluvial Vegetation type, which comprises of two major types of vegetation patterns, namely riverine thicket and thornveld. Mucina and Rutherford (2006) describe this distinction as "The riverine thicket tends to occur in the narrow floodplain zones in regions close to the coast or further inland, whereas the thornveld occurs on the wide floodplains further inland and this vegetation type is regarded as Endangered (EN)". The Albany Alluvial Vegetation was identified as an EN ecosystem and listed within the National Threatened Ecosystems (2011). The vegetation type is shown to occur within isolated areas surrounding mid-section of the proposed OHPL, however, after the field observations this vegetation type could not be positively confirmed.

3.2 Ground-truthed vegetation characteristics

Due to variations in vegetation structure and species composition, based on vegetation characteristics and sensitivity, different habitat units were distinguished for the proposed OHPL. Information provided by previous studies[9] were also used to inform the decision making concerning the distinction of habitat units and assigning sensitivities.

Based on the results of the field investigation conducted in February and March of 2022 by STS, five broad habitat units were determined for the Investigation Area with several Sub-Units distinguished within the habitat units:

- **Sundays Arid Thicket:**

[8] A liana is a woody climbing plant that generally hangs from trees.
[9] Ecological Impact Assessment prepared for Ukomeleza Wind Power (Pty) Ltd,by EOH Coastal and Environmental Services, (2016).

- Low Growing Shrubland; and
- Scattered Bush Clumps; and
- Tree Dominated Shrublands.

- **Sundays Valley Thicket;**
- **Grassridge Bontveld:**
  - Calcareous Grasslands; and
  - Thicket Patches.
- **Transformed Areas,** encompassing roads, fence lines, areas transformed by anthropogenic as well as artificial impoundments; and
- **Freshwater Habitat:**
  - Other Drainage Features (preferential flow paths); and
  - Watercourses (including various river systems, their associated tributaries, ephemeral drainage lines and episodic drainage lines).

Concerning the **Albany Alluvial Vegetation (**indicated for several sections along the OHPL from the desktop databases)**,** after assessing the proposed footprint of the OHPL there were no discernible features of this vegetation type observed (based on species composition or vegetation structure). As no remnants of this vegetation type was confirmed on site, no further reference to the Albany Alluvial Vegetation will be made henceforth.

For a breakdown of the floral communities, habitat characteristics and conservation sensitivities associated with the above-mentioned habitat units, refer to Section 3.2.1 – 3.2.5. Figures 3 – 15 depict the habitat units associated with the Investigation Area.

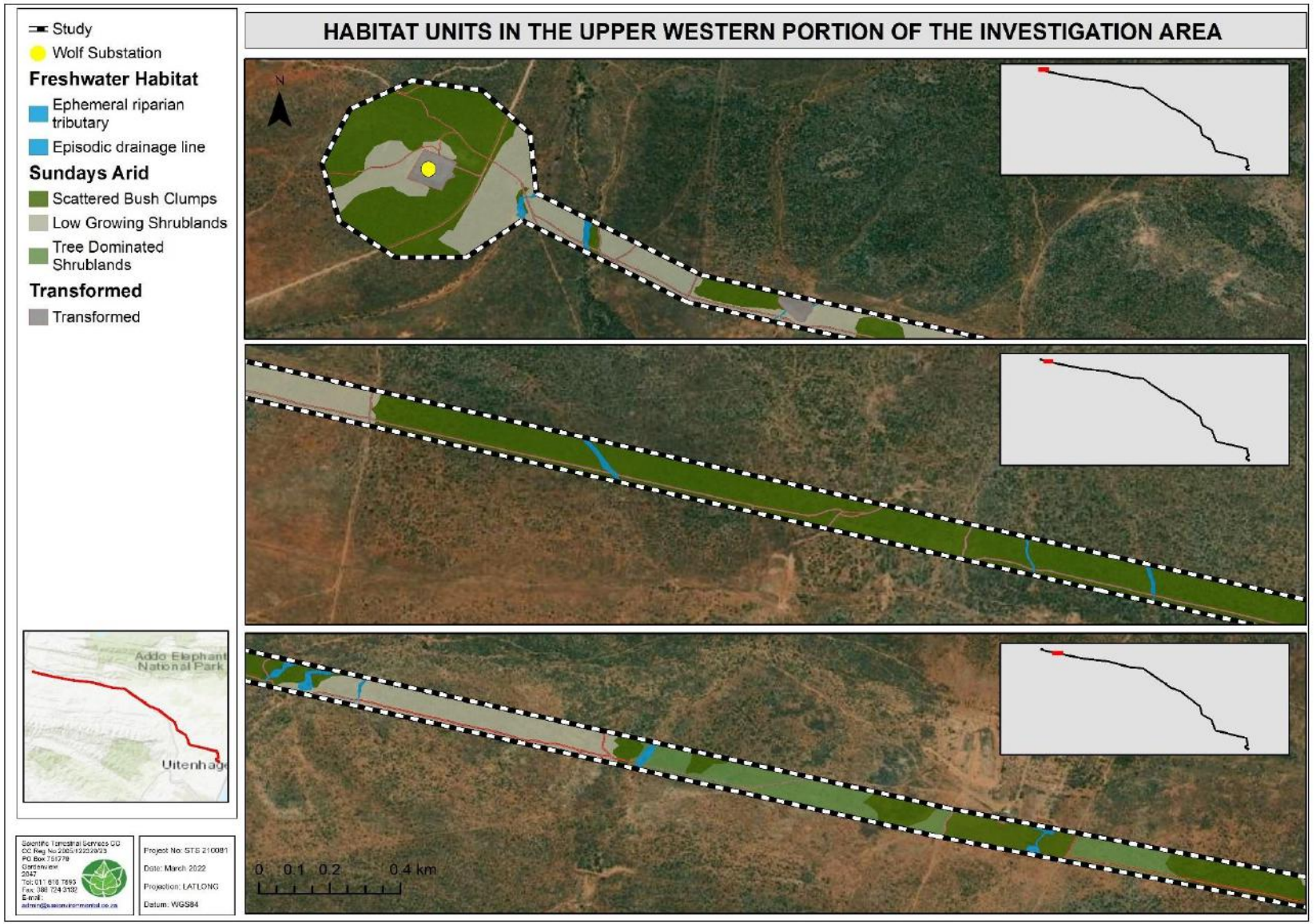


Figure 1: Distribution of Habitat Units and Sub-Units located within the upper Western portion of the Investigation Area.

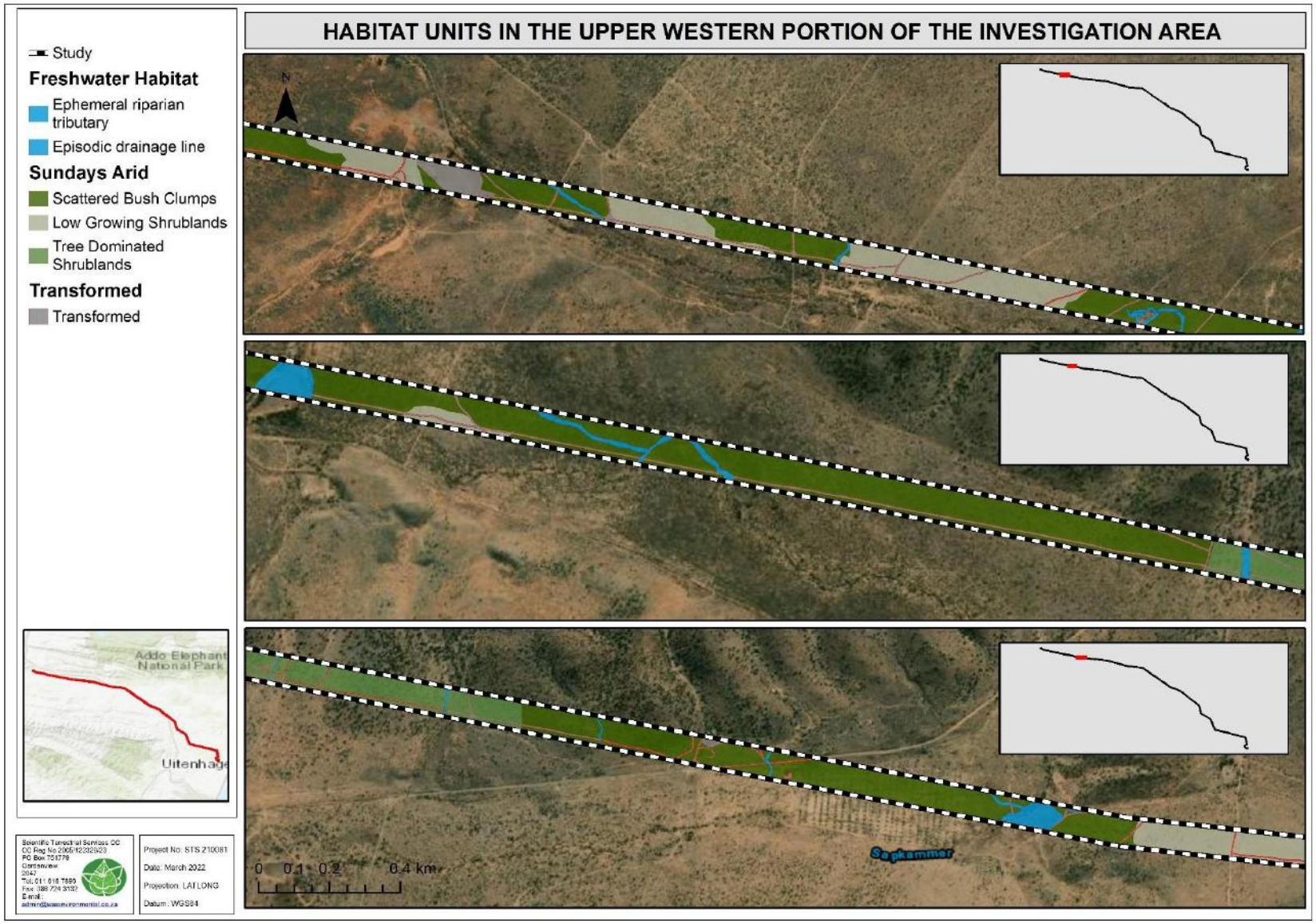


Figure 2: Distribution of the Habitat- and Sub-Units located in the Upper Western portion of the Investigation Area, section two.

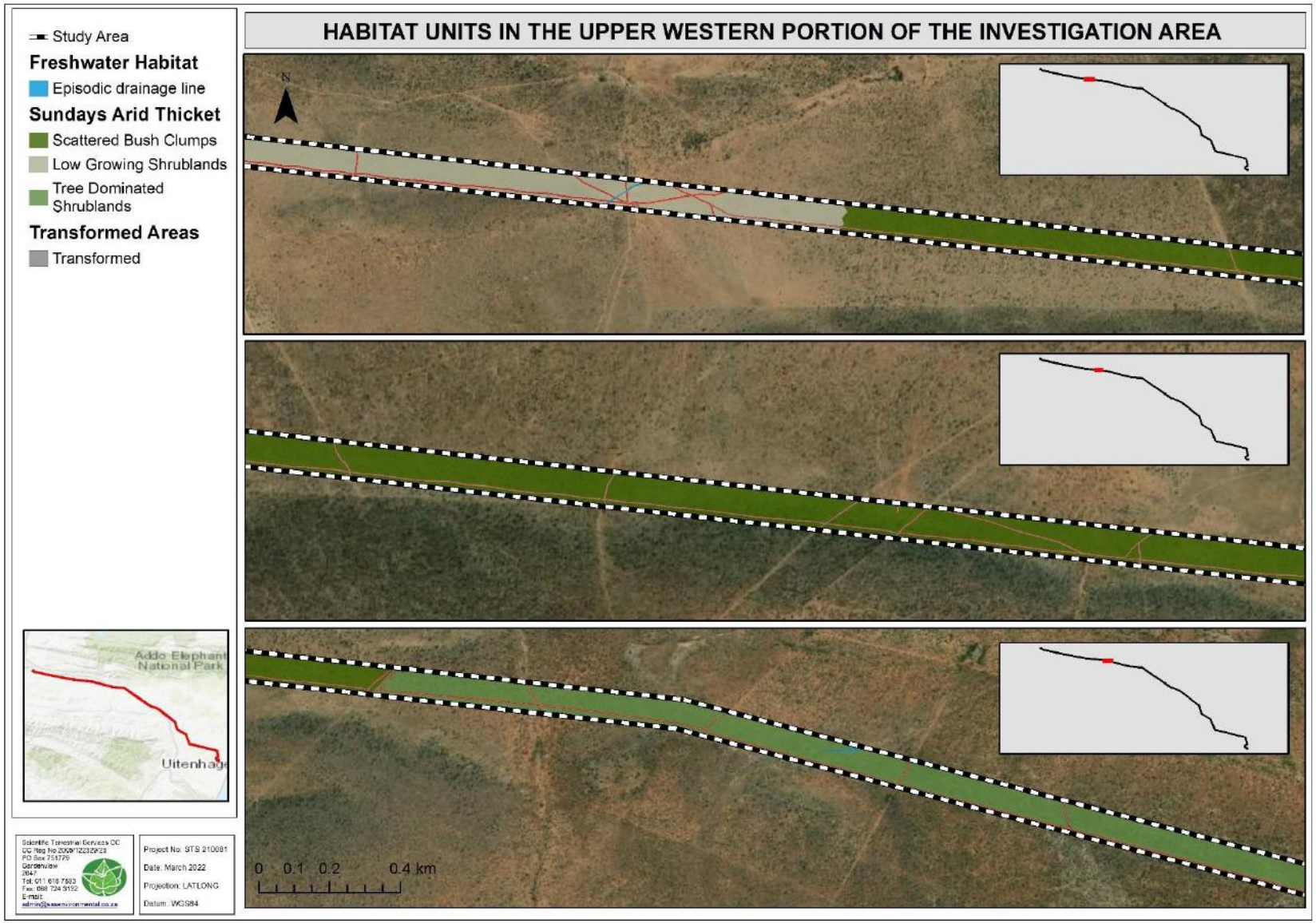


Figure 3: Distribution of the Habitat- and Sub-Units located in the Upper Western portion of the Investigation Area, section three.

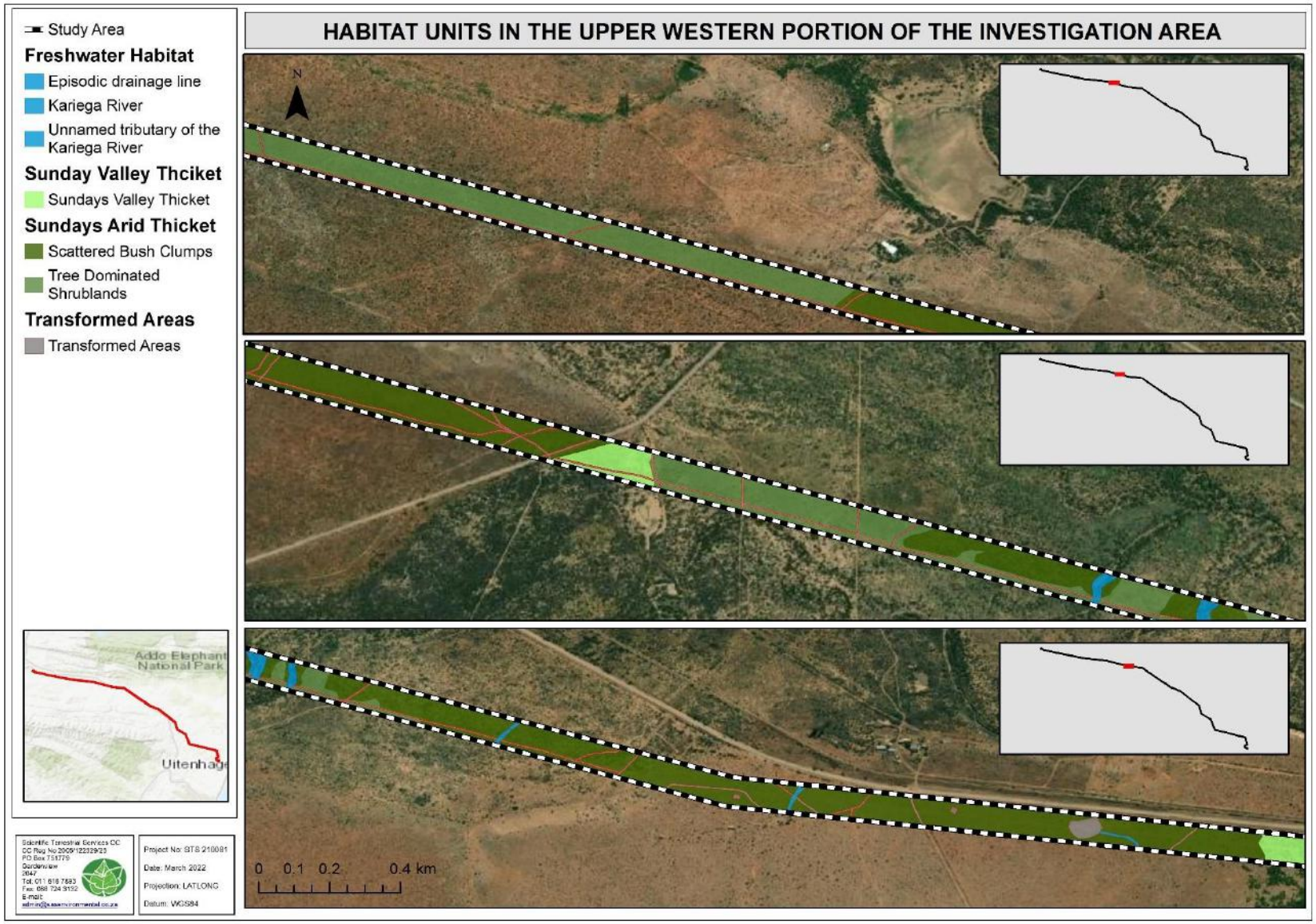


Figure 4: Distribution of the Habitat- and Sub-Units located in the Upper Western portion of the Investigation Area, section four.

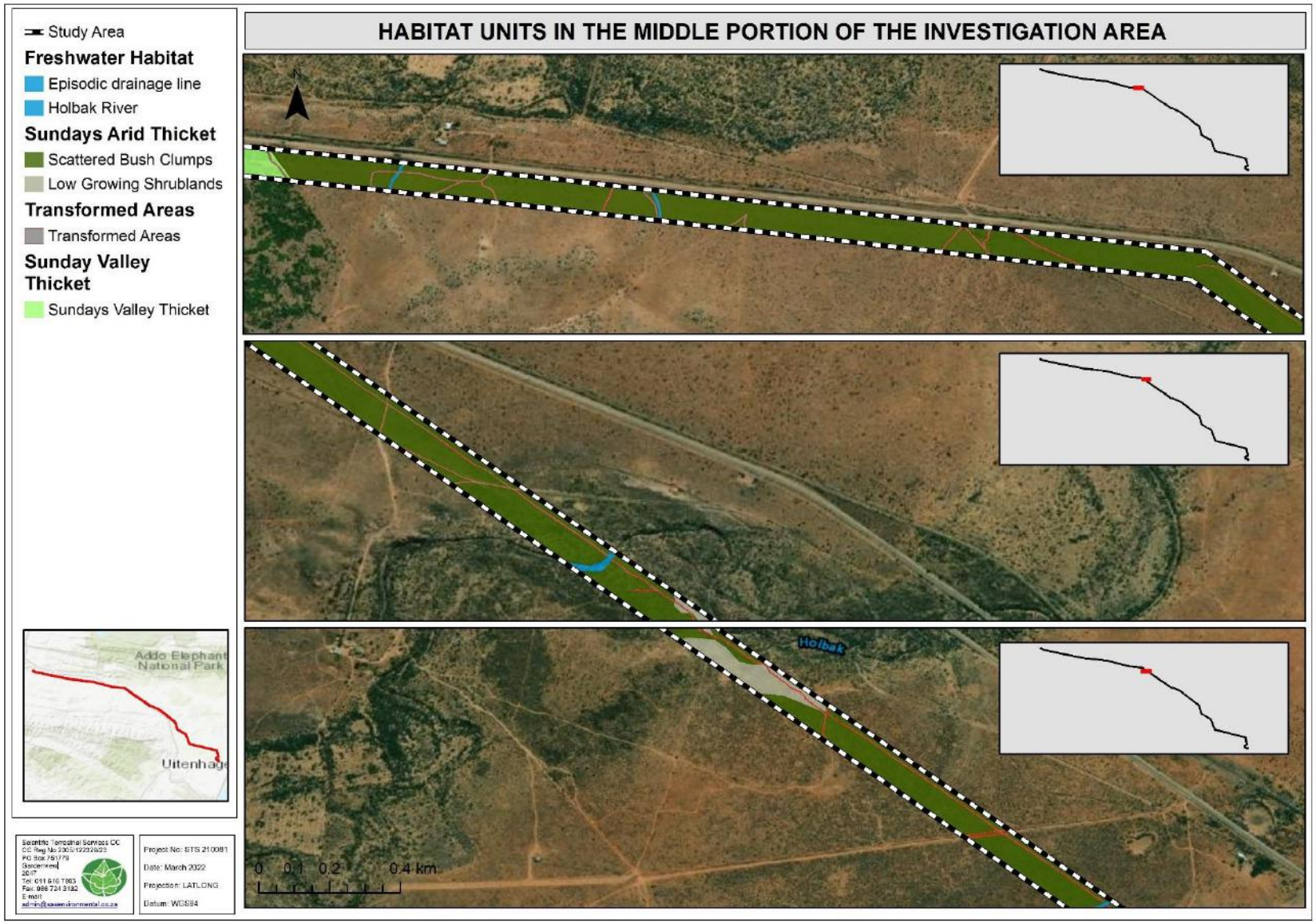


Figure 5: Distribution of the Habitat- and Sub-Units located in the Middle portion of the Investigation Area.

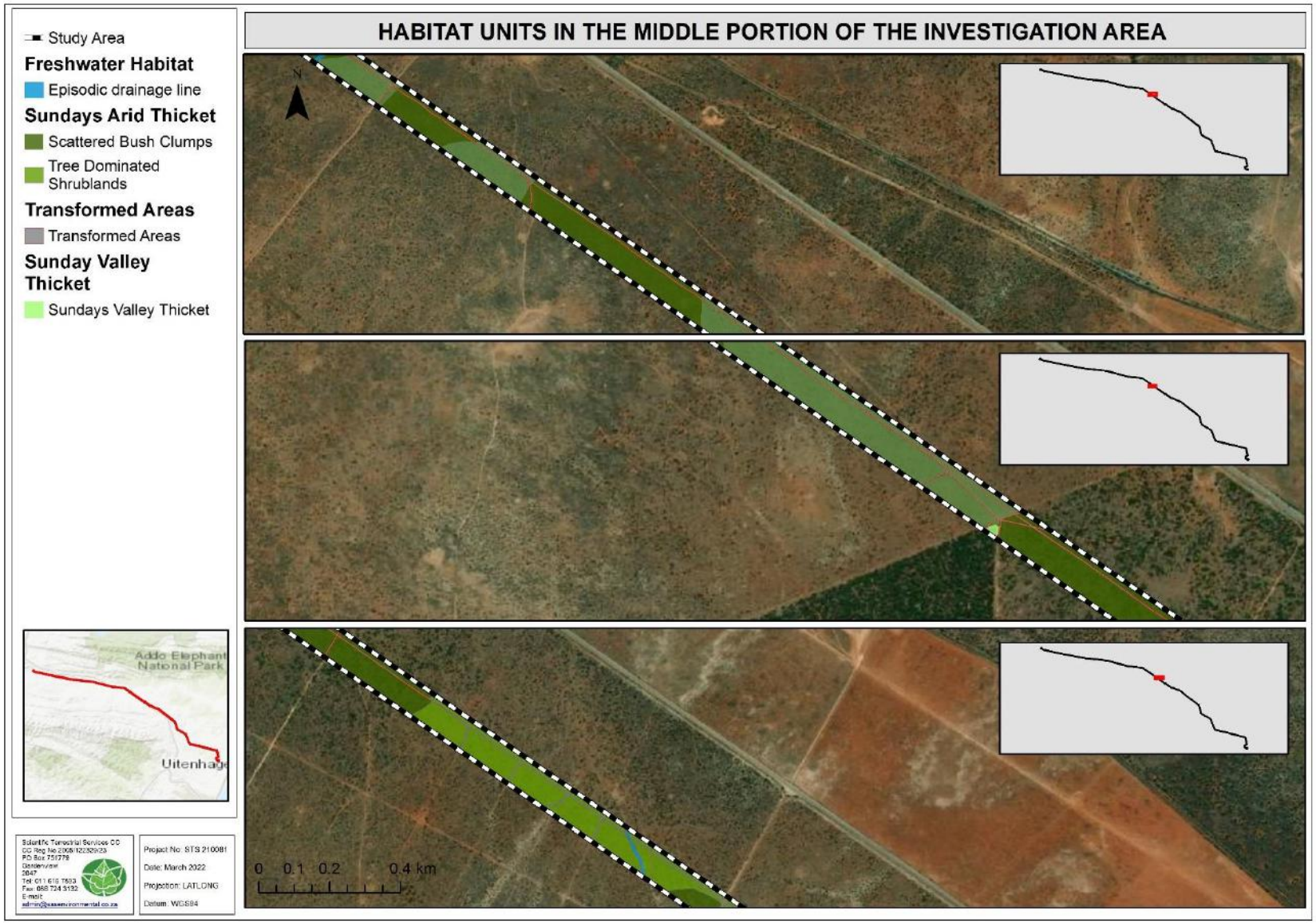


Figure 6: Distribution of the Habitat- and Sub-Units located in the Middle portion of the Investigation Area, section two.

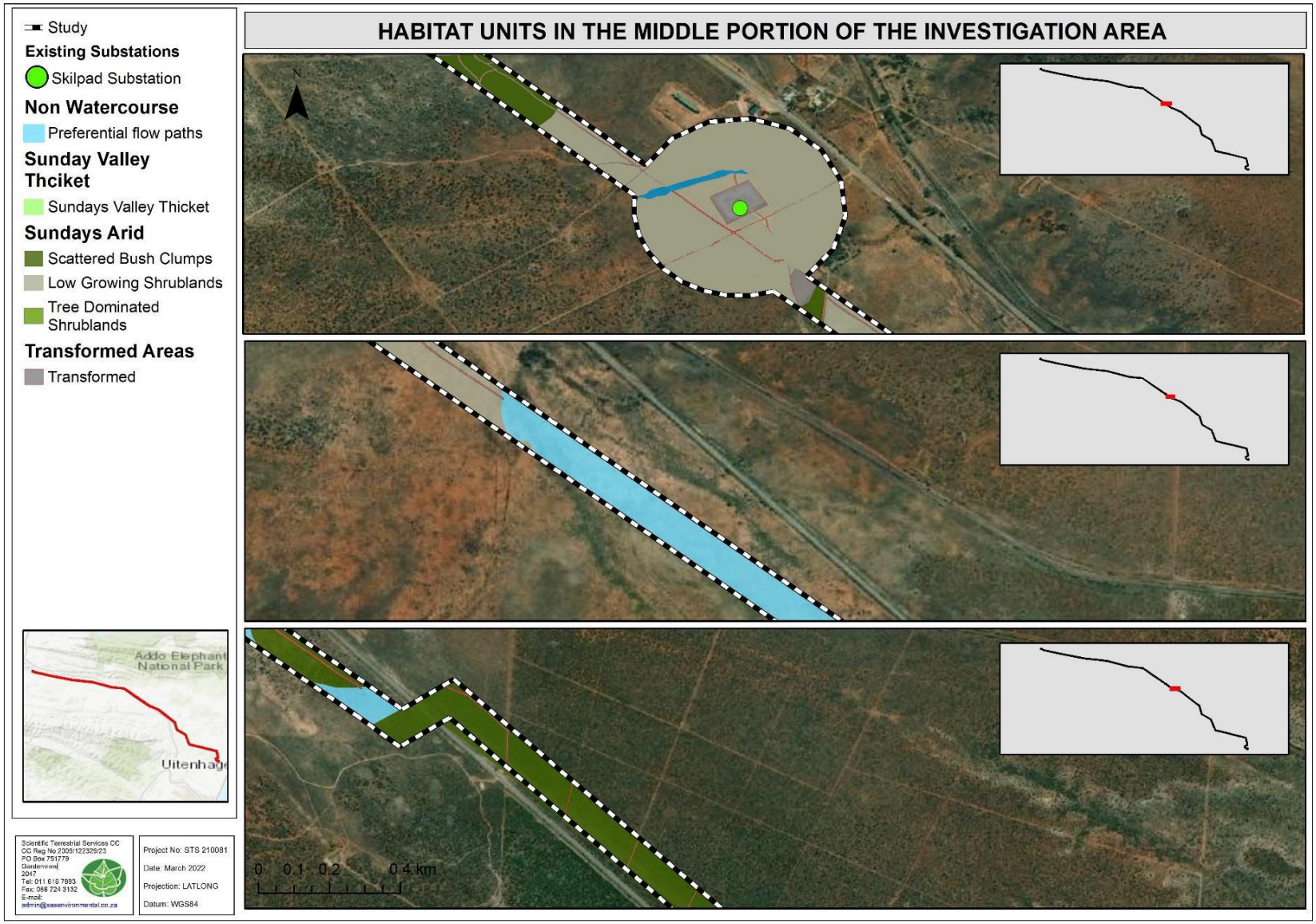


Figure 7: Distribution of the Habitat- and Sub-Units located in the Middle portion of the Investigation Area, section two.

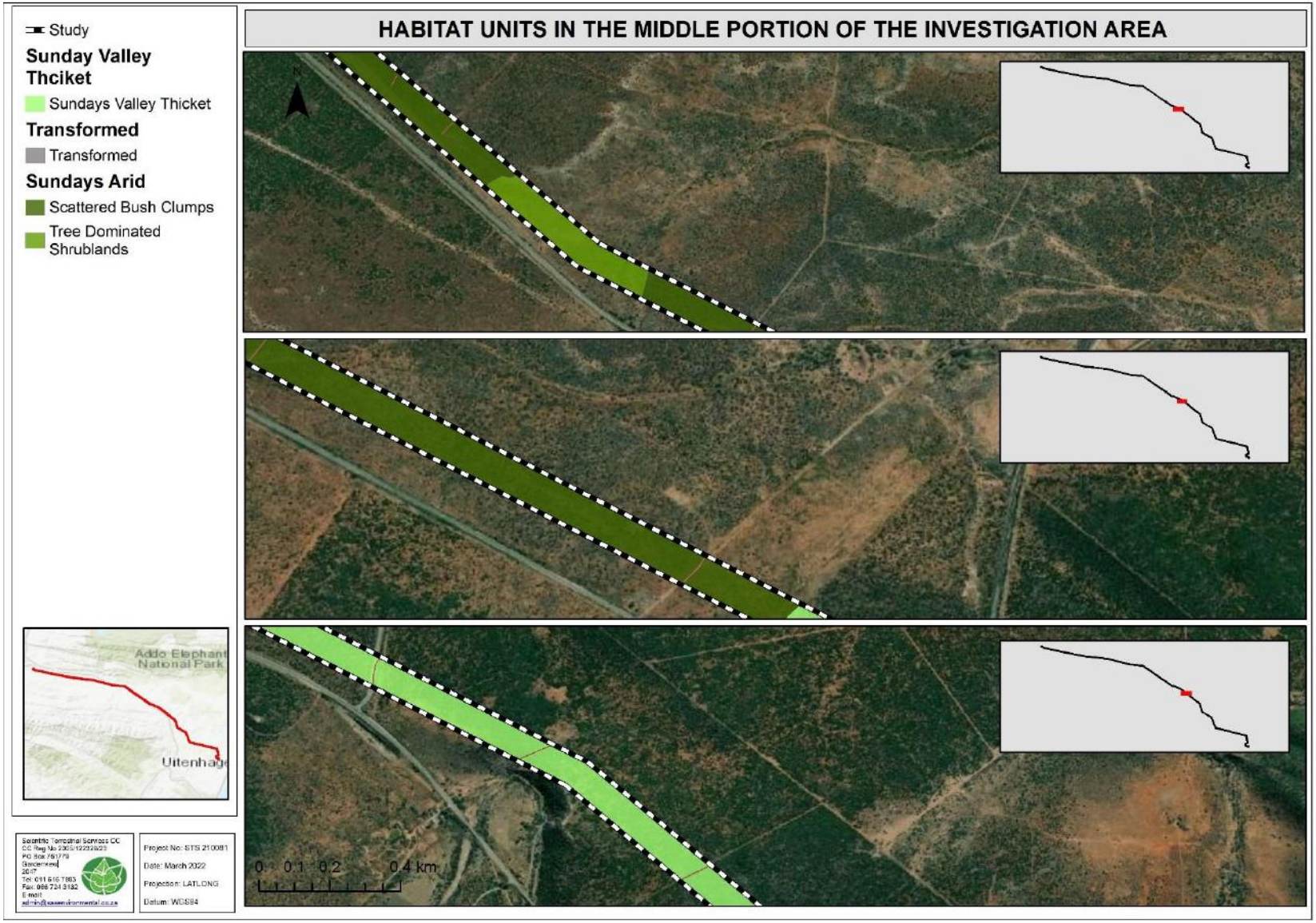


Figure 8: Distribution of the Habitat- and Sub-Units located in the Middle portion of the Investigation Area, section three.

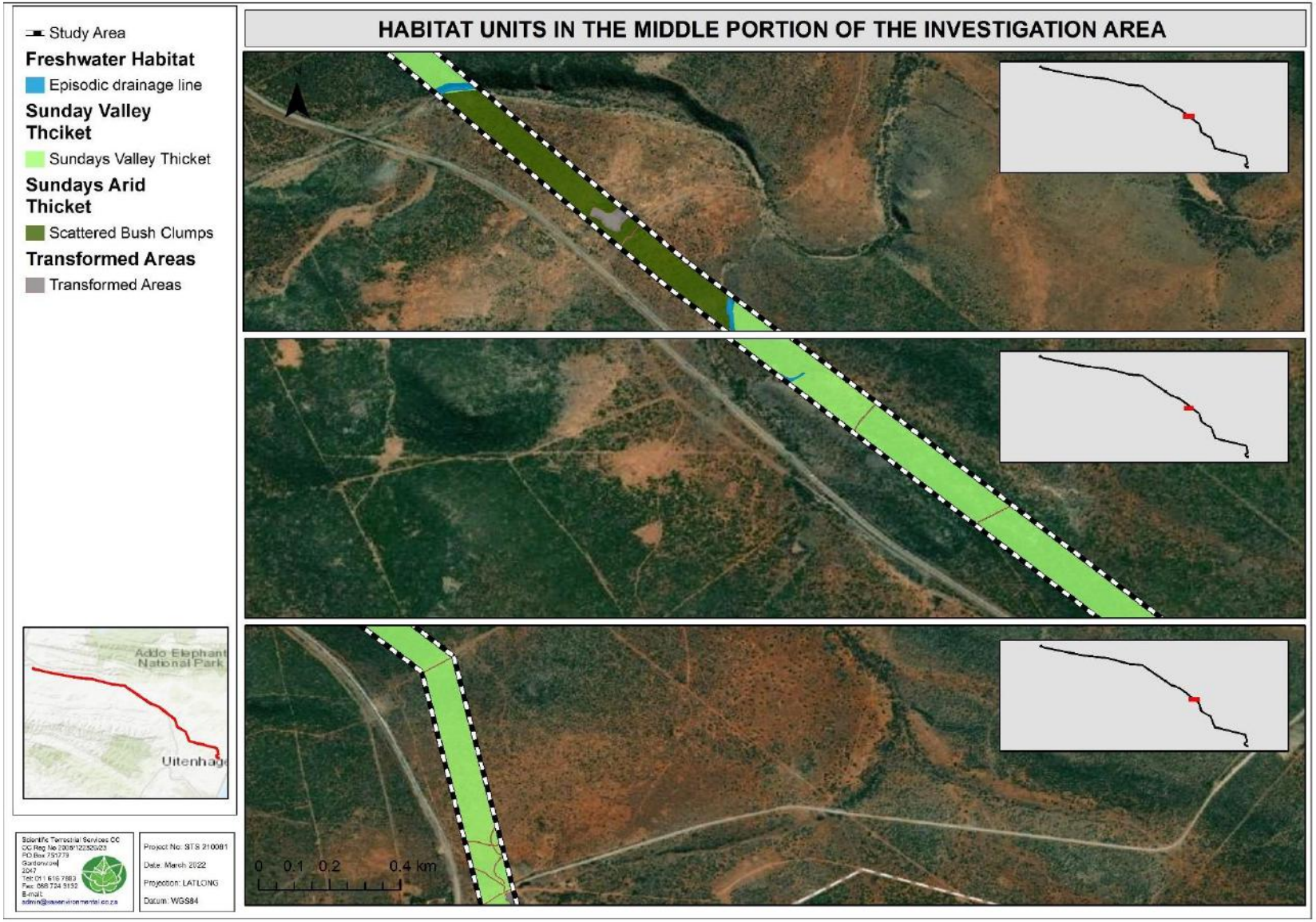


Figure 9: Distribution of the Habitat- and Sub-Units located in the Middle portion of the Investigation Area, section four.

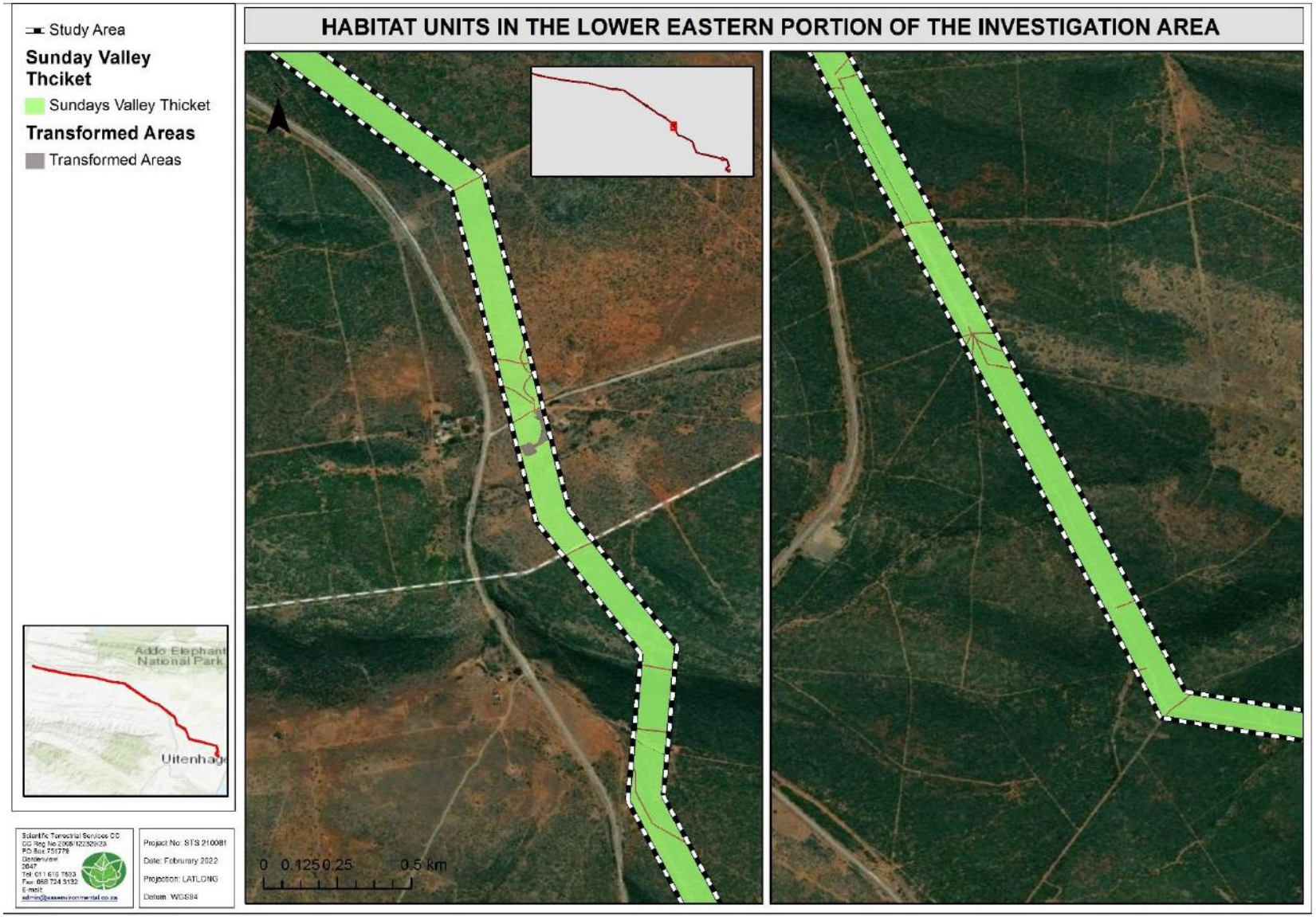


Figure 10: Distribution of the Habitat- and Sub-Units located in the Middle portion of the Investigation Area, section five.

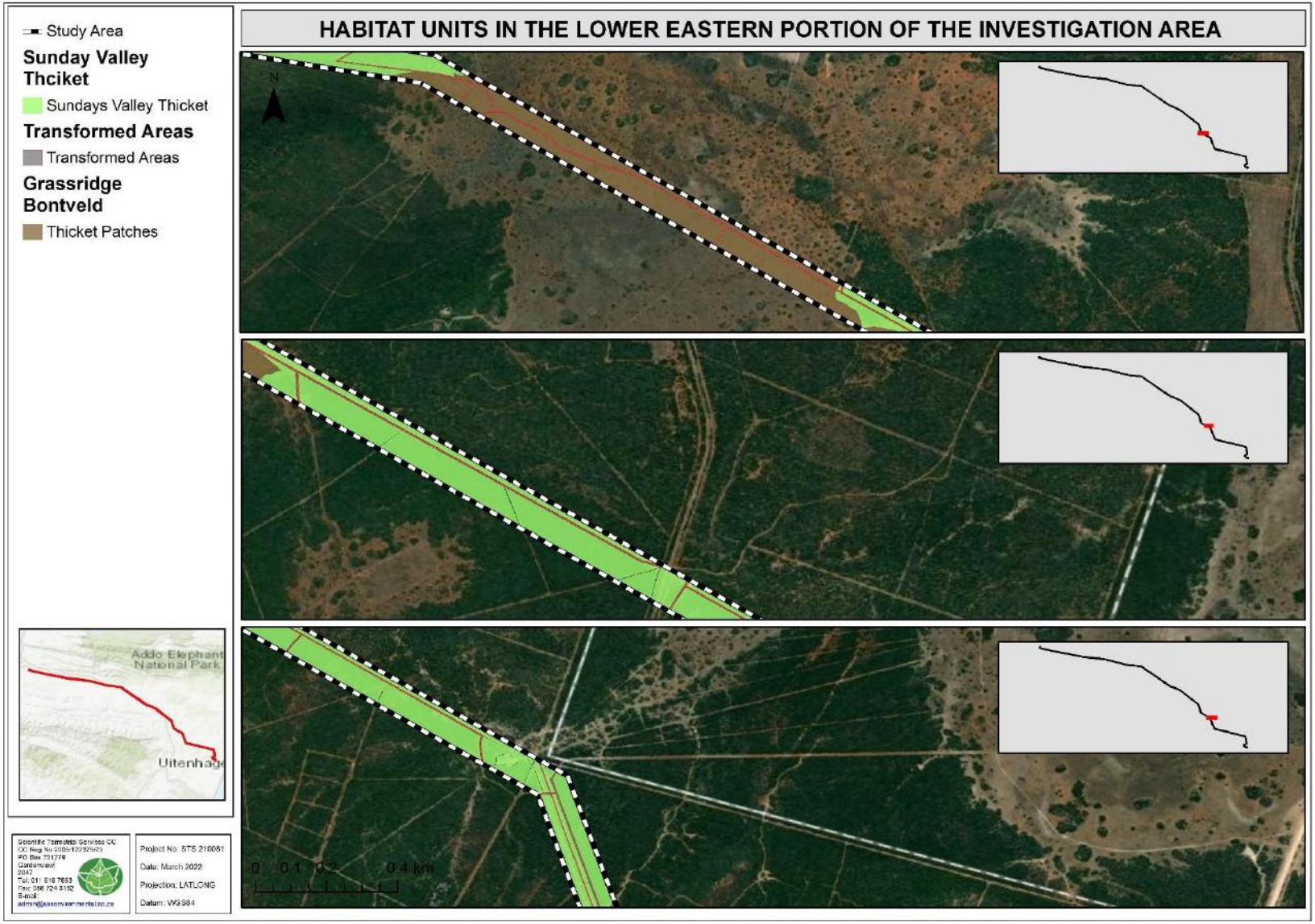


Figure 11: Distribution of the Habitat- and Sub-Units located in the Middle portion of the Investigation Area, section six.

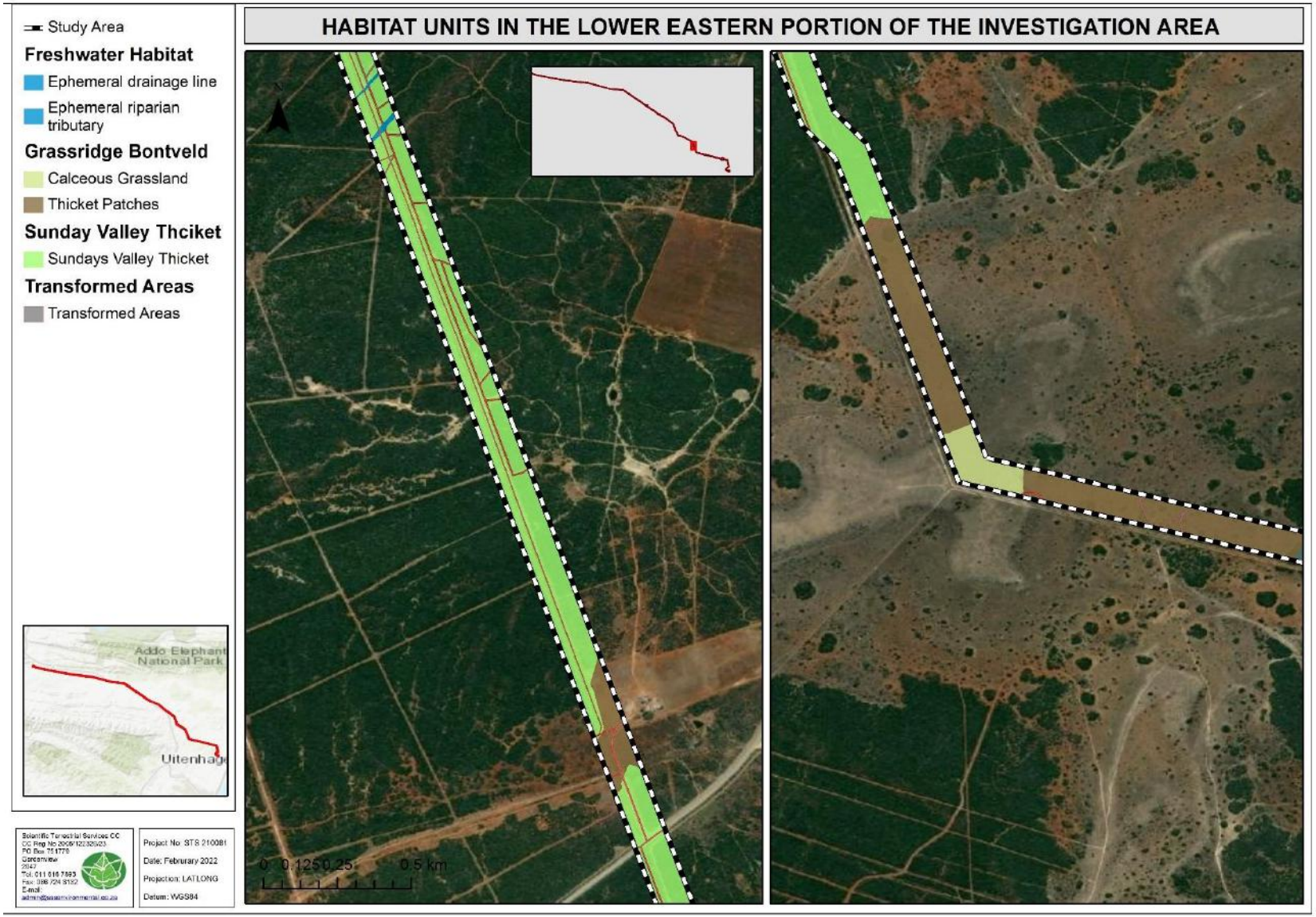


Figure 12: Distribution of the Habitat- and Sub-Units located in the Middle portion of the Investigation Area, section seven.

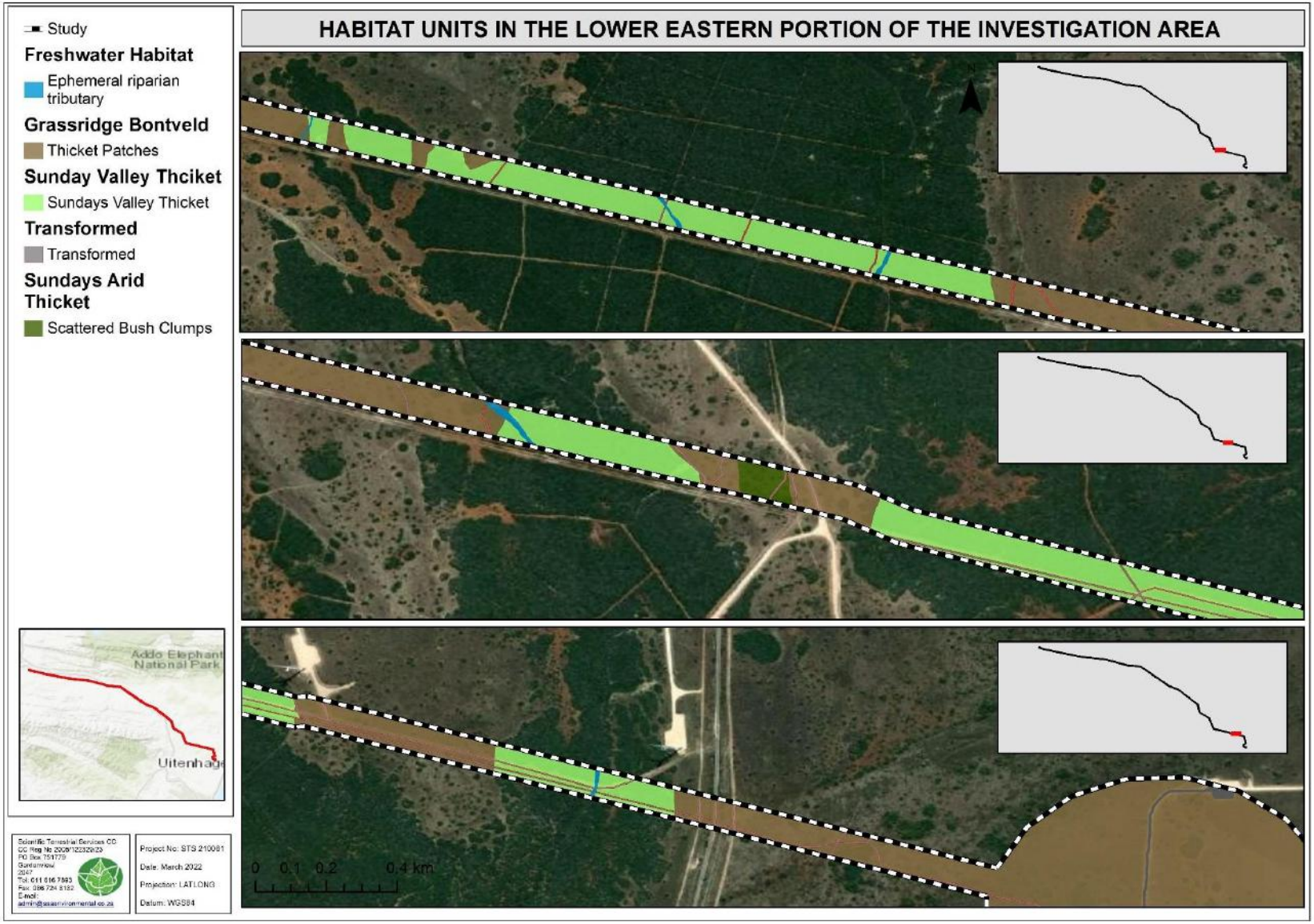


Figure 13: Distribution of the Habitat- and Sub-Units located in the Middle portion of the Investigation Area, section eight.

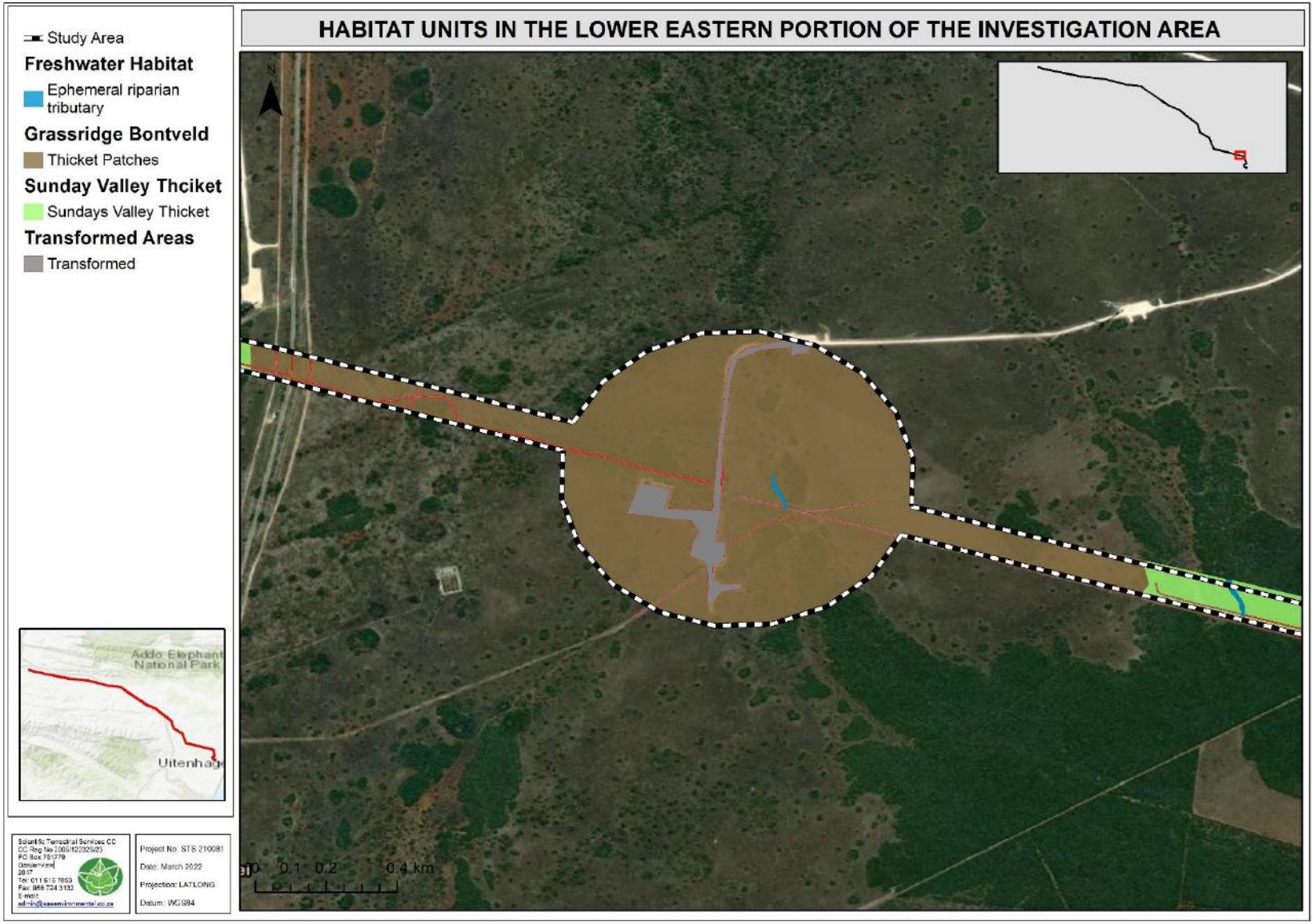


Figure 14: Distribution of the Habitat Units and Sub-Units located in the Lower Eastern Portion of the Investigation Area.

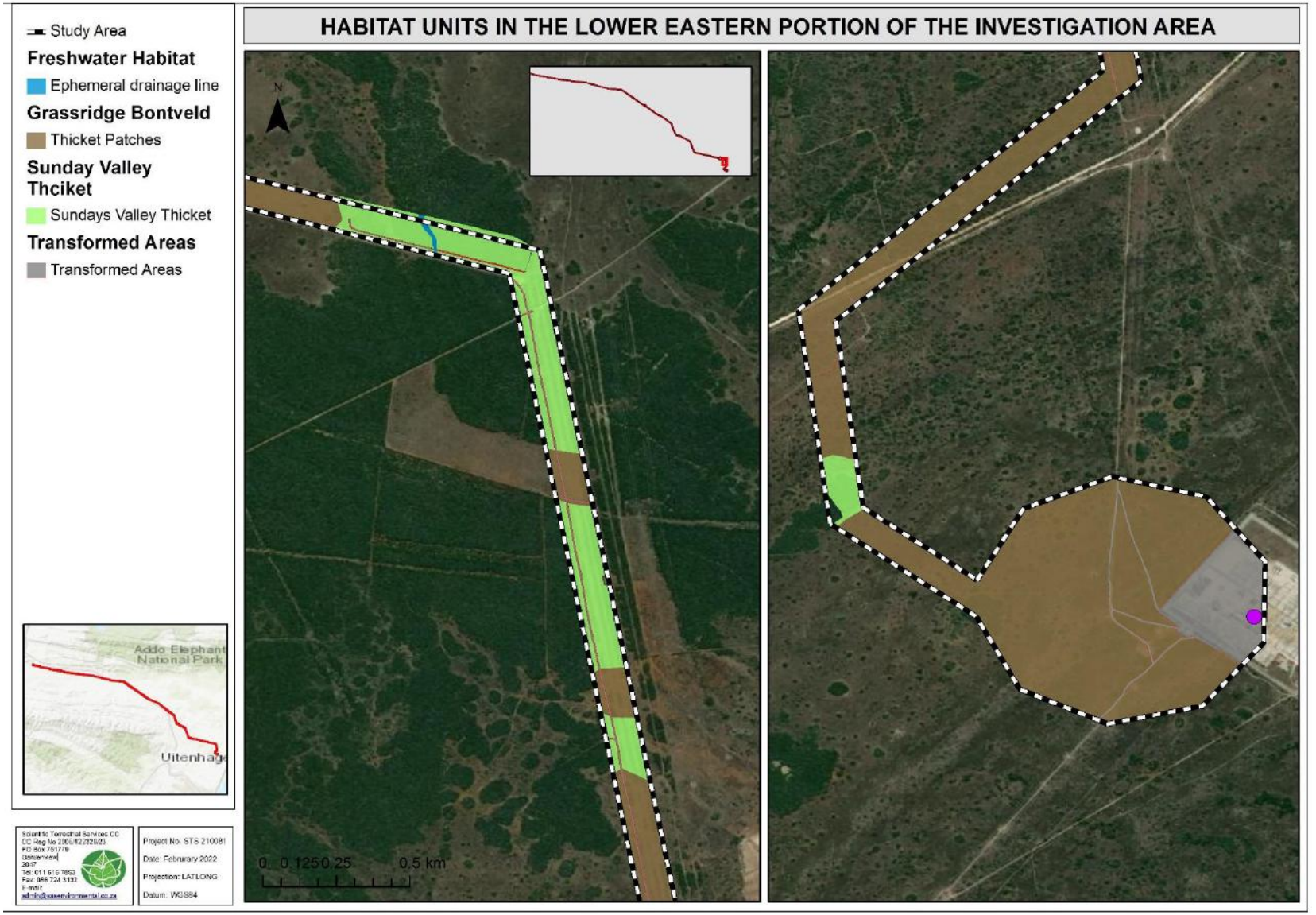


Figure 15: Distribution of the Habitat Units and Sub-Units located in the Lower Eastern Portion of the Investigation Area, section two.

3.2.1 Sundays Arid Thicket Habitat Unit

Sub-Units: Low Growing Shrubland, Scattered Bush Clumps, Tree Dominated Shrublands

<table>
<tr><th colspan="3">LOW-GROWING SHRUBLAND</th></tr>
<tr><td>Representative habitat photos</td><td colspan="2">    </td></tr>
<tr><th>SPECIES OVERVIEW</th><th colspan="2">HABITAT OVERVIEW</th></tr>
<tr><td>The species composition of this habitat Sub-Unit is not representative of the reference vegetation type:

➢ Dominant shrub species include Grewia robusta, Gymnosporia capitata, Carissa haematocarpa, Asparagus crassicladus, Asparagus subulatus, Azima tatracanth and Solanum tomentosum;
➢ Common herbaceous species include Rhoicissus digitata, Tribulus terrestris and Xanthanium spinosum;
➢ Succulent species were widespread yet and represented by Mesembryanthemum crystallinum and Delosperma cloeteae;
➢ Graminoid species, while not abundant, included Aristida congesta subsp. congesta, Tragus berteronianus, Cynodon dactylon, Eragrostis lehmanniana and Panicum maximum; and
➢ AIPs and Dominant Indigenous Encroacher species were widespread, but not abundant, in this Sub-Unit and consisted of Opuntia ficus-indica (an AIP species) and Vachellia karroo (an indigenous encroacher species).

The vegetation structure differed significantly from that of the reference state. Despite the species within this Sub-Unit consisting of some of the species expected</td><td colspan="2">This Sub-Unit occurred mostly on the Top Western portion of the OHPL with small, scattered sections around the middle and lower Eastern extent.

The main vegetation structure can be described as low-short, dense shrubland (Appendix A: Diagram A1) where low shrubs occurred in a high density, interspersed by some tall shrubs, and with an underrepresentation of grass species. This Sub-Unit supported a moderately high species richness which was best represented in the woody component. The most abundant species representing the semi-continues shrubland layer includes Grewia robusta, Asparagus crassicladus, Carissa haematocarpa and Azima tatracanth. Graminoid species were not well represented within this vegetation Sub-Unit and mostly included Tragus berteronianus and Setaria verticillata.

This Sub-Unit reflected moderate impacts from grazing and Alien Invasive Plants species (AIPs) infestations. Grazing pressures have resulted in some areas being more prone to erosion as was noted by the clear loss of stabilising vegetation within some sections. The presence and abundance of AIP species indicated a degrading/transformative effect possibly taking place within this Sub-Unit.

The vegetation surrounding the existing servitude is considered Indigenous vegetation (sensu National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) Listing Notices) since no previous clearing of these areas occurred within the last 10 years which could have significantly disturbed the natural vegetation.</td></tr>
</table>

for the reference vegetation type, the impacts from grazing have resulted in a structural shift from succulent thicket to a more-woody low shrub component.

Refer to **Appendix B – Table B1** for a list of species recorded within this Sub-Unit (and those to follow) by STS and **Appendix B – Table B2** for the list of species recorded for the relevant Quarter Degree Squares (QDS).

SOME REFERENCE PHOTOS OF FLORA WITHIN THIS SUB-UNIT

From Left to right: *Asparagus crassicladus, Blepharis capensis, Eragrostis lehmanniana, Azima tatracanth, Setaria verticillata, Pentzia incana.*

SCATTERED BUSH CLUMPS

Representative habitat photos

SPECIES OVERVIEW

The Sub-Unit conforms to the general description of the reference vegetation when considering the impact of local grazing:

- **Woody species layer** consists of *Boscia oleoides*, *Schotia afra, Euclea undulata, Pappea capensis* and *Vachelia karroo*; and
- **Tall shrub layer** is represented by *Grewia robusta, Gymnosporia polycantha* and *G. capitata, Searsia longispina, Azima tatracanth* and *Carissa haematocarpa*;

HABITAT OVERVIEW

This Sub-Unit occurred throughout the entire extent of the OHPL.

This vegetation unit can be described as **sparse-closed, short bushland.** This vegetation Sub-Unit has a higher density and abundance of tall shrubs when compared to Low Growing Shrubland, including some small tree species and a moderate abundance of low shrubs. This vegetation Sub-Unit exists in a matrix of graminoid species. The bush clumps are often dominated by either the invasive *Opuntia ficus-indica*, or encroaching *Vachellia karroo;* in extreme cases both are dominant.

- **Low shrub layer** included several species, namely *Asparagus crassicladus* and *A. striatus, Solanum tomentosum* and *Blepharis capensis;*
- **Graminoid species** are represented by *Tragus berteronianus, Cenchrus ciliaris, Eragrostis obtusa, Cynodon dactylon, Aristida diffusa* and *Panicum maximum*;
- **Succulent species** were limited to an area restricted to sandy soil. Several succent species were found, namely *Mesembryanthemum crystallinum, Mesembryanthemum rhizophorum, Delosperma cloeteae, Glottiphylum longum, Crassothonna cacaloides* and *Hereroa tenuifolia; and*
- **AIPs and Dominant Indigenous Encroacher species** present consisted of *Opuntia ficus-indica* and the indigenous encroacher *Vachellia karroo.*

This vegetation Sub-Unit has a higher species richness compared to that of the Low Growing Shrubland Sub-Unit, which is attributed to the increased presence of tree species associated with the bush clumps (a cluster of mostly woody species, >1.5 m radius). The species composition remains similar to the reference state.

Refer to **Appendix B – Table B1** for a list of species recorded within this Sub-Unit by STS and **Appendix B – Table B2** for the list of species recorded for the relevant QDS.

The density of these bush clumps can vary from sparse to relatively dense vegetation stands reflecting an almost thicket-like structure.

Despite the moderate to high presence and abundance of AIPs within this habitat Sub-Unit, and the localised effects of grazing, most of the Scattered Bush Clumps still conform to the general species composition of the reference state.

The vegetation surrounding the existing servitude is considered Indigenous vegetation (sensu National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) Listing Notices) since no previous clearing of these areas occurred within the last 10 years which could have significantly disturbed the natural vegetation.

SOME REFERENCE PHOTOS OF FLORA WITHIN THIS SUB-UNIT

Top From left to right: *Pappea capensis, Asparagus crassicladus, Euclea undulata, Schotia afra,*
Bottom From left to right : *Grewia robusta, and Azima tatracanth.*

TREE-DOMINATED SHRUBLANDS		
Representative habitat photos		 
SPECIES OVERVIEW		**HABITAT OVERVIEW**
The species composition minimally aligned with that from the reference state however several plant groups were underrepresented (e.g., low shrubs, tall shrubs and succulent species): ➢ **Dominant tree layer** was represented by *Pappea capensis*, *Euclea undulata, Boscia oleoides, Schotia afra* and *Vachellia karroo*; ➢ **Herbaceous and graminoid groundcover species** mostly consisted of *Tragus berteronianus* and *Cynodon dactylon* (graminoids) and *Gomphrena celosioides*; ➢ **Low Shrubs** while limited were present, namely *Asparagus crassicladus* and *Blepharis capensis*; and ➢ **AIPs and Dominant Indigenous Encroacher species** included Opuntia ficus-indica and encroacher species *Vachellia karroo, Tribulus terrestris* and *Agave americana.* The ground cover vegetation cover, which included *T. berteronianus* and *G. celosioides* are indicative of land degradation and heavy grazing practices taking place within this vegetation Sub-Unit (Bromilow, 2018). The vegetation structure does not conform to the expectation of that from the reference state. This is confirmed by the low abundance of shrubs and dominance of tree species within this Sub-Unit.		This Sub-Unit was limited to the top Western and Middle portion of the OHPL . This Sub-Unit can be described as **short, sparse woodland,** where the vegetation comprised of a dominant (but scattered) tree layer: *Boscia oleoides* and *Euclea undulata*, with some isolated low shrubs within a graminoid matrix. The lack of a grassy ground layer could be due to recent drought conditions and/or potentially extensive grazing pressures. While the existing powerline stretches across a large expanse of this vegetation Sub-Unit, no visual effect of the servitude from the previous powerline can be discerned on the floristic composition in the surrounding vegetation. Due to the low species richness and abundance, this vegetation Sub-Unit could potentially be more vulnerable to disturbance than the rest of this habitat unit. AIPs are not wide-spread or abundant within this habitat unit yet present, but extensive effects of grazing were observed. These areas are characterised by indigenous vegetation (as per NEMA Listings) since no significant destruction these areas occurred within the last 10 years and have therefore not significantly disturbed this Sub-Unit.

Refer to **Appendix B – Table B1** for a list of species recorded within this Sub-Unit by STS and **Appendix B – Table B2** for the list of species recorded for the relevant QDS.	
SOME REFERENCE PHOTOS OF FLORA WITHIN THIS HABITAT SUB-UNIT	
 **From left to right:** *Gomphrena celosioides*, *Euclea undulata*, *Pappea capensis, Schinus polygama, Asparagus crassicladus* and *Schotia afra.*	
SPECIES OF CONSERVATION CONCERN AND PRESENCE OF UNIQUE LANDSCAPES (CBAs, ESAs, PROTECTED AREAS, INDIGENOUS FOREST, ETC.)	
Presence of Unique Landscapes	According to the Screening Tool, the Terrestrial Sensitivity for the entire Investigation Area is considered to be **Very High**. The triggered sensitivity features include: - **CBA**: For which the screening tool identified the Sundays Arid Thicket Habitat Unit to be in a CBA1 and CBA2. The CBA classification was based on the presence of Critically Endangered Ecosystems, the presence of "irreplaceable sites" for conservation and important vegetation types, species, or points (Eastern Cape Biodiversity and Conservation Plan; ECBCP). For the Scattered Bush Clump Sub-Unit, this can be confirmed as it is representative of the reference vegetation type, which is regarded as a Vulnerable (**VU)** vegetation type. However, for the Low Growing Shrubland and Tree Dominated Bush Clump Sub-Units, these results suggested that these Sub-Units are not representative of the CBAs anymore since this area is greatly overgrazed (i.e., transformed) and is no longer a good representative of the reference vegetation type. - **ESA**: The Screening Tool also identified this Habitat Unit as an ESA1, based on the presence of an ecological corridor required to connect an ecological network and a possible climate change refugia offering resilience against climate change. However, due to separation of independent farms through the placement of fences, thereby promoting a fragmented landscape, this is no longer an important corridor. These results indicated that these Sub-Units are not ESAs. - **Centres of Plant Endemism**: The full extent of the OHPL is located within the Albany Centre of endemism (ECBCP, 2007). With a low, to negligible, presence of endemic species from this centre of endemism present on site, along with the current state of the habitat units and immediate surrounding anthropogenic influences, this habitat unit and all three Sub-Units are unlikely to provide suitable habitat for a decent representation of important endemics. Due to the confirmed CBA for the Scattered Bush Clump Sub-Unit, the Screening Tool outcome was confirmed only for this Sub-Unit.
Species of Conservation Concern	The Screening Tool identified the majority of the proposed OHPL to be in a **high sensitivity** area for the Plant Species Theme. The medium sensitivity was triggered by the **potential occurrence** of 11 floral SCCs (please refer to Appendix C and Part A: Section 3), several of which obtained a medium Probability of Occurrence (POC) within this Habitat Unit namely: *Cotyledon tomentosa* subsp. *tomentosa* (**VU**) and Sensitive Species 997 (Endangered; **EN**). The medium sensitivity outcome of the Screening Tool is therefore confirmed for Scattered Bush Clumps Sub-Unit but not for Low Growing Shrubland and Tree Dominated Shrublands Sub-Units. However, no additional threatened SCC (i.e., Red Data Listed plants), in terms of Section 56(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA), nationally protected species in terms of the NEMBA Threatened or Protected Species (TOPS) Regulations (General Notice (GN) R152 of 2007, as amended),or nationally protected tree species under the National Forest Act, 1998 (Act No. 84 of 1998, as amended in September 2011) (NFA) were recorded during the site assessment. The POC for these species were low.

	Permits from the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) and authorisation from the Department of Forestry, Fisheries, and the Environment (DFFE) should be obtained to remove, cut, or destroy any of the above-mentioned protected and/or threatened species before any vegetation clearing may take place. Refer to **Appendix C** for the complete floral SCC assessment results.

CONCLUDING REMARKS

Based on the species composition and richness of the Low Growing Shrubland and Scattered Bush Clump Sub-Units, these areas are considered to be representative natural environments of the reference vegetation type. These areas are in a near natural condition and is therefore important from a floral ecological perspective. However, the Tree Dominated Bush Clump Sub-Unit has experienced heavy grazing pressures and land degradation that was noted to be extensive. As such, this Sub-Unit is of a low importance from a floral ecology perspective.

Important considerations:

- The POC for SCCs is low within the Low Growing Shrubland and Tree Dominated Shrubland Sub-Units, which can be attributed to unsuitable soil conditions, the visible effects of erosion and the presence of AIPs. The POC for SCC's are higher for the Scattered Bush Clump Sub-Unit than the other Sub-Units, due to this Sub-Unit most closely conforming to the structure and composition of the Sundays Arid Thicket reference vegetation type.
- The floral diversity was relatively high within the Low Growing Shrubland and Scattered Bush Clump Sub-Units due to an abundance of thicket species and presence of more unique succulent species. Compared to the other Sub-Units within this habitat unit, the Tree Dominated Shrubland Sub-Unit has a low species richness and more distinct impacts noted from grazing and land degradation.
- The Sundays Arid Thicket Habitat Unit occurs within a **VU** vegetation type where a target of 19% conservation is required. However, Addo Elephant National Park and Noorsveld Protected Environment is currently actively conserving part of this vegetation unit as part of the Sundays Arid Thicket Vegetation Type.

If the proposed activities for this OHPL is approved, the following key considerations should be adhered to;

- Due to the proliferation of AIPs and encroachment by indigenous woody species within this habitat unit, especially within the Scattered Bush Clumps Sub-Unit, there is an increased risk that these species could be introduced to the surrounding, more sensitive habitat during the construction and operational phases of the proposed project. It is therefore important that edge effects be mitigated, and an AIP management plan must be devised and implemented. Refer also to **Section 3.3**.
- Due to the potential presence of SCC within the Scattered Bush Clumps Sub-Unit, it will be necessary to undertake a walkdown of the servitude areas as well as the approved sites for pylon erection. During this walkdown, floral SCC must be searched and marked, and their eligibility for rescue and relocation investigated (not all threatened species can be relocated without compromising population genetics). For species that can easily be relocated, such species would need to be relocated to similar, suitable habitat within close proximity of the source population.

Please refer to **Section 4** for a description of habitat sensitivity and **Section 5** for the anticipated impacts to this habitat unit.

3.2.2 Sundays Valley Thicket

<table>
<tr><th colspan="3">SUNDAYS VALLEY THICKET</th></tr>
<tr><td>Representative habitat photos</td><td colspan="2">    </td></tr>
<tr><th>SPECIES OVERVIEW</th><th colspan="2">HABITAT OVERVIEW</th></tr>
<tr><td>Within this habitat unit it is difficult to distinguish between different strata of vegetation as understory plants (graminoids, succulents and herbaceous species), shrubs and trees form a dense (impenetrable) thicket – which is a characteristic of the reference vegetation type.
➢ Dominant succulent shrub species observed in this Sub-Unit included Portulacaria afra, Euphorbia caerulescens, Crassula capitella subsp. capitella, Crassula cordata, Crassula ovata, Euphorbia mauritanica, Kalanchoe rotundifolia and Rhigozum obovatum;
➢ Small trees observed in this Habitat Unit included Euclea undulata, Pappea capensis, Schotia afra, Cussonia gamtoosensis and C. spicata;
➢ Low shrubs species were common in this vegetation type, namely Asparagus crassicladus, Asparagus subulatus and Solanum tomentosum;
➢ Tall shrubs were identified within the dense thicket, for example Azima tetracantha, Gymnosporia capitata, Gymnosporia polyacantha, Plumbago auriculata, Searsia longispina and Scutia myrtina;
➢ Succulent trees that were observed are Aloe africana, Aloe ferox, Aloe speciosa, Euphorbia grandidens and the alien Opuntia ficus-indica; and
➢ Graminoid species observed in this Sub-Unit included: Cynodon dactylon, Eragrostis obtusa, Panicum maximum, Sporobolus fimbriatus, Themeda triandra and Eragrostis curvula.</td><td colspan="2">This Habitat Unit occurred mostly within the Middle and Lower Eastern portions of the OHPL.

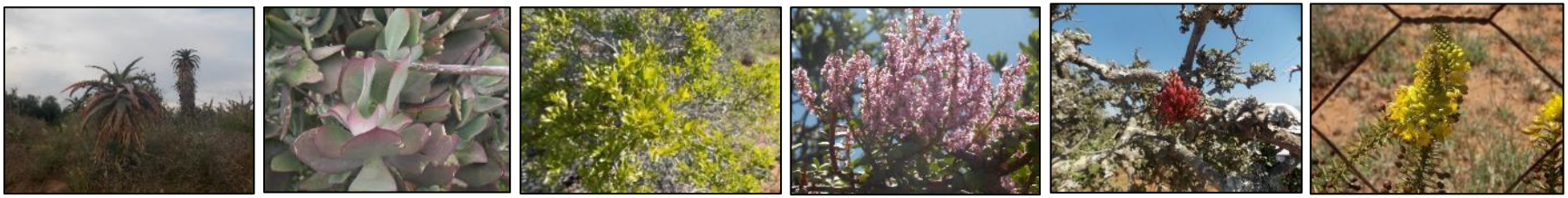
The main vegetation structure can be described as short Thicket. The high density and/or abundance of succulent trees, shrubs, some tall shrubs, woody climbers and some graminoid species contribute to the dense thicket structure of the vegetation. The vegetation structure of the Sundays Valley Thicket is known to be variable depending on the soil type. For the Investigation Area, a continuous distribution (only fragmented by existing roads and fences) existed for a large proportion of the proposed OHPL.

Due to the dense thicket nature of this Habitat Unit, only the edges of the thicket could be investigated along the existing powerline (which was only possible up to 1.5 m into the thicket) to ascertain the composition of this vegetation community. Limited access was gained (for large sections of this specific habitat unit) during the February 2022 field assessment and therefore where observations could be made on site, these were used to inform the conditions of other similar stands of vegetation (i.e., data was extrapolated for much of this habitat unit).However, during the March field assessment access to sections of the OHPL within the Sundays Valley Thicket was unimpeded and full assessment of floral community was indeed possible. The vegetation is in a good natural state with high presence of spekboom (P. affra and succulents suggesting it is not degraded and natural process are intact) as suggested by the Albany Thicket Biodiversity Guidelines. Furthermore, the good natural condition provided favourable habitat for the presence of several SCC.

The field assessment revealed that this habitat unit is a good representative of the reference vegetation type, with the only deviation being the presence and extent of AIPs, which are abundant where they were</td></tr>
</table>

➢ **AIPs** are widespread especially Opuntia ficus-indica, especially surrounding construction sites and disturbed areas (i.e., fence lines and access roads). The vegetation structure conforms to the reference state. Refer to **Appendix B – Table B1** for a list of species recorded within this habitat unit by STS and **Appendix B – Table B2** for the list of species recorded for the relevant QDS.	present yet have a limited extent. The area can be described as indigenous vegetation (as per NEMA description) as no previous clearing of these areas occurred within the last 10 years which could have significantly disturbed the natural vegetation.

SOME REFERENCE PHOTOS OF FLORA WITHIN THIS HABITAT UNIT



From Left to right: *Aloe ferox, Crassula ovata, Euclea undulata, Portulacaria afra, Schotia affra* and *Bulbine frutescens.*

SPECIES OF CONSERVATION CONCERN AND PRESENCE OF UNIQUE LANDSCAPES (CBAs, ESAs, PROTECTED AREAS, INDIGENOUS FOREST, ETC.)

Presence of Unique Landscapes	According to the Screening Tool, the Terrestrial Sensitivity for the entire study area is considered to be **Very High**. The triggered sensitivity features include: - **CBA**: For which the screening tool identified this Habitat Unit to be in a CBA1. As mentioned previously, the CBA classification was based on the presence of Critically Endangered Ecosystems and the presence of "irreplaceable sites" for conservation and important vegetation types (ECBCP). Based on the good natural state of the vegetation and indicators of ecological stability, along with high abundances of several SCC (of which one species is endangered and protected) this Habitat Unit can be as a confirmed CBA 1; - **ESA**: The Screening Tool also identified this Habitat Unit as an ESA1, based on the presence of an ecological corridor required to connect an ecological network and a possible climate change refugia offering resilience against climate change. This Habitat Unit was observed as a continues strip of Sundays Valley Thicket and can therefore act as a sufficient natural corridor. The results from the Screening tool can be confirmed. - **Centres of Plant Endemism**: the full extent of the OHPL is located within the Albany Centre of endemism (ECBCP, 2007), the POC for endemic species are medium-high within this Habitat Unit therefore this is a possible representative of the Albany Centre of Endemism. The presence of important biodiversity and conservation features, as mentioned above, confirms the outcome of the Screening Tool.
Species of Conservation Concern	The Screening Tool identified most of the proposed OHPL route to be in a **high sensitivity** area for the Plant Species Theme. The medium sensitivity is triggered by the potential occurrence of several floral SCCs (Refer to Appendix C). A medium-high POC was determined within this Habitat Unit for the following triggered species: *Argyrolobium barbatum* (**VU**), *Rhombophyllum rhomboideum (***EN***), Apodolirion macowani* (**VU**), *Corpuscularia lehmannii* (**CR**), Sensitive Species 1268 (**EN; confirmed**), Sensitive Species 570 (**EN**), *Strelitzia junce* (**VU: confirmed**) and *Syncarpha recurvata* (**EN**). The outcome of the Screening Tool for the plant species theme is therefore confirmed.

	No additional threatened SCC, in terms of Section 56(1) of the NEMBA, nationally protected species in terms of the NEMBA TOPS list, or nationally protected tree species under the NFA were recorded during the site assessment. There is a medium POC for some NFA and NEMBA TOPS species (see Appendix **C**), therefore the Screening Tool for the plant species theme is confirmed. Permits from the Eastern Cape DEDEAT and authorisation from the DFFE should be obtained to remove, cut, or destroy any of the above-mentioned protected and/or threatened species before any vegetation clearing may take place.

CONCLUDING REMARKS

The Sundays Valley Thicket vegetation type is in a good natural condition and is identified as an ESA1 and is therefore of significant importance from a floral ecologist's perspective.

Important considerations:

- The POC for SCC was medium- high for this habitat unit, based on soil type and possible favourable micro-climate conditions created within the dense canopies and thicket vegetation types. This habitat unit can provide favourable conditions for the presence of some SCCs like *Strelitzia juncea Asparagus spinescens* and *Justica orchioides* subsp. *orchioides.*
- The floral diversity was high within this habitat unit due to the presence of many different plant taxa and different growth-forms.
- The Sundays Valley Thicket Habitat Unit occurs within a **LC** vegetation type where a target of 19% conservation is required, and part of this vegetation unit is actively conserved by Addo Elephant National Park and Noorsveld Protected Environment. However, due to good natural condition of this Habitat unit and the high abundance of important species this Habitat Unit was classified as a CBA 1;
- The Habitat Unit has a few restricted localities with a high abundance of invasive species and therefore habitat integrity is affected. However, considering the extent and largely natural state of this habitat unit, the effect of AIPs is minimal.
- No additional presence of unique landscapes was identified within this habitat unit.

If the proposed activities for this OHPL is approved, the following key considerations should be considered:

- Since this habitat unit has some AIPs present the threat of spread and introduction into the surrounding, more sensitive habitats during the construction and operational phases of the proposed project., is high. It is therefore important that edge effects be mitigated, and an AIP management plan must be devised and implemented. Refer also to **Section 3.3**.
- Due to the potential presence of SCC within the Sundays Valley Thicket Habitat Unit, it will be necessary to undertake a walkdown of the servitude areas as well as the approved sites for pylon erection. During this walkdown, floral SCC must be searched and marked, and their eligibility for rescue and relocation investigated (not all threatened species can be relocated without compromising population genetics). For species that can easily be relocated, such species would need to be relocated to similar, suitable habitat within close proximity of the source population.

Please refer to **Section 4** for a description of habitat sensitivity and **Section 5** for the anticipated impacts to this habitat unit.

3.2.3 Grassridge Bontveld

Habitat Sub-Units: Calcareous Grasslands and Thicket Patches

	CALCAREOUS GRASSLANDS
Representative habitat photos	 

SPECIES OVERVIEW	HABITAT OVERVIEW
The species composition did not compare well to that of the reference state: ➢ **Dominant grasses** identified within this habitat unit include *Aristida diffusa, Cynodon dactylon, Themeda triandra, Cymbopogon pospichilli, Eragrostis obtusa, Eragrostis curvula* and *Panicum maximum;* ➢ **Succulent shrubs** were also a dominant feature within this vegetation Sub-Unit with *Crassula expansa, Crassula ericoides, Crassula perforate* and *Crassula tetragona* present; ➢ **Forb species** including *Indogofera sessilifolia, Jamesbrittenia microphylla, Berkheya heterophylla, Tephrosia capensis, Hermannia althaeoides, Chascanum hederaceum, Eriosema kraussianum* and *Chironia baccifera* were observed within this Sub-Unit; and ➢ **Succulent trees** species while limited in abundance consisted of some Aloe species (*A. ferox* and *A. africana*) identified in the vicinity of this Sub-Unit. ➢ **AIP's** was limited to the presence of *Opuntia ficus-indica* This Sub-Unit has a no tall woody species or low shrubs which is expected to be a dominant habitat structure compared to Mucina and Rutherford's description of the reference state	This Sub-Unit occurred only on the lower Eastern portions of the proposed OHPL. The main vegetation structure can be described as **short-tall, closed Grassland,** and comprises a high abundance of graminoid species intermitted with various herbaceous species. There are some low shrubs and succulent trees also scattered within this habitat unit (yet limited). The presence of AIP species (e.g., *Opuntia ficus-indica*) within this habitat unit is cause for concern as there are several sections that are considered heavily degraded due to the extensive proliferation of the AIPs that have replaced native species.). The vegetation structure does not conform to the reference state, with the presence and abundance of expected bush clumps being limited. This under-representation of bush clumps can potentially be due to previous activities relating to mining and wind farm installations or the distinctive soil properties. The vegetation surrounding the existing servitude is considered Indigenous vegetation (sensu National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) Listing Notices) since no previous clearing of these areas occurred within the last 10 years which could have significantly disturbed the natural vegetation.

Refer to **Appendix B – Table B1** for a list of species recorded within this habitat unit by STS and **Appendix B – Table B2** for the list of species recorded for the relevant QDS.	

SOME REFERENCE PHOTOS OF FLORA WITHIN THIS HABITAT SUB-UNIT

From Left to right: *Tephrosia grandiflora, Tephrosia capensis, Leonotis listii, Oxalis smithian, Aloe ferox, Crassula perforata,* and *Crassula expansa.*

THICKET PATCHES

Representative habitat photo

SPECIES OVERVIEW	HABITAT OVERVIEW
The species composition of this Sub-Unit is representative of the reference state: ➢ **Dominant tree** layer consists of *Schotia afra, Euclea undulata* and *Sideroxylon inerme;* ➢ **Succulent trees** included *Aloe africana* and *Aloe ferox;* ➢ **Tall shrubs** species observed in this Sub-Unit consisted of *Carissa bispinossa* and *Gymnosporia capitata*; ➢ **Low shrubs** present in these dense thicket areas included *Asparagus striatus, Blepharis capensis, Hermannia althaeoides, Helicrysum anomalum, Tephrosia capensis* and *Agathosoma capensis*;	This Sub-Unit occurred on the lower Eastern portions of the OHPL. This Sub-Unit's structure can be described as **tall, open shrubland** with a high density and abundance of tall shrubs, succulent trees, small trees, and low shrubs within a grassy matrix. In some areas of this Sub-Unit, the presence of AIP species is limited; however, within most of the remaining extent, there was significant habitat transformation resulting from AIP proliferation which resulted in a degraded natural state of the surrounding vegetation.

➢ **Graminoid** species included *Tragus berteronianus, Eragrostis obtusa, Themeda triandra* and *Panicum maximum*; and ➢ **AIPs** dominant in this habitat unit included *Acacia cyclops* and *Opuntia ficus-indica,* which are both abundant and widespread. Refer to **Appendix B – Table B1** for a list of species recorded within this vegetation Sub-Unit (and those to follow) by STS and **Appendix B – Table B2** for the list of species recorded for the relevant QDS.	The vegetation structure remains representative of the reference vegetation type. The abundance of *T. berteronianus* along with the extent of AIPs indicate severe land degradation taking place within this Sub-Unit. The vegetation surrounding the existing servitude is considered Indigenous vegetation (sensu National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) Listing Notices) since no previous clearing of these areas occurred within the last 10 years which could have significantly disturbed the natural vegetation.

SOME REFERENCE PHOTOS OF FLORA WITHIN THIS HABITAT SUB-UNIT

From left to right: *Acacia cyclops* (NEMA Category 1b)*, Crassula perfoliata, Euclea undulata, Hypoxis hemerocallidea, Pelargonium reniforme, Sideroxylon inerme* (a NFA Protected species) and *Opuntia ficus-indica* (NEMBA Category 1b).

SPECIES OF CONSERVATION CONCERN AND PRESENCE OF UNIQUE LANDSCAPES (CBAs, ESAs, PROTECTED AREAS, INDIGENOUS FOREST, ECT)

Presence of Unique Landscapes	According to the Screening Tool, the Terrestrial Sensitivity for the entire study area is considered to be **Very High**. The triggered sensitivity features include: - **CBA**: The Thicket Patches Sub-Unit are representative of the reference vegetation type which is considered a LC vegetation type that is therefore not regarded as an "irreplaceable site" nor a Critically Endangered Ecosystem (ECBCP). Furthermore, the Calcareous Grasslands was not representative of the reference vegetation state as such, the CBA 1 was not confirmed for these habitat sub-units; and - **ESA**: Thicket Patches and Calcareous Grasslands did not represent significant natural corridors or potential climate refugia sites therefore neither of these Sub-Units can be identified as ESA's. Therefore, the expected ESA 1 is not confirmed. - **Centres of Plant Endemism**: the full extent of the OHPL is located within the Albany Centre of endemism (ECBCP, 2007); after the field assessment no endemic species were identified and therefore based on these results, these Sub-Units were not identified as important representatives of the Albany Centre. Since the Thicket Patches was identified as a CBA the Screening Toll outcome can be confirmed for this Sub-Unit however not for the Calcareous Grasslands.
Species of Conservation Concern	The Screening Tool identified the majority of the proposed OHPL route to be in a **high sensitivity** area for the Plant Species Theme. The medium sensitivity is triggered by the POC of potential SCCs (refer to Appendix **C** for the full species list); since one of these SCCs Sensitive Species 1268 (**EN**) are now confirmed to occur within the Thicket Patches Sub-Unit and have a medium POC for *Zugophyllum divaricatum* (**EN) .** The medium sensitivity outcome of the Screening Tool is therefore confirmed for Thicket Patches Sub-Unit but not for Calcareous Grasslands Sub-Unit. This confirms the outcome of the screening tool analysis.

	One threatened/endangered species was found within this Habitat Unit (due to the sensitivity of this species we cannot divulge its name), in terms of Section 56(1) of the NEMBA. The suggested buffer zone for exclusion of developmental activities for species with an **EN** status is 200 m (SANBI Red List of South Africa) therefore a safety perimeter should be created around the sensitive species to ensure adequate avoidance and, in turn, protection of this species. Considering the cumulative effects of the powerline (transportation, construction and maintenance activities), mitigation efforts will have to be implemented within all phases namely: construction and maintenance phase. The outcome of the Screening Tool for the plant species theme is therefore confirmed. One additional threatened species were identified from the nationally protected tree species list under the (NFA), namely *Sideroxylon inerma* (**LC: P**). Therefore, the screening tool outcome for the plant species theme is supported. Permits from the Eastern Cape DEDEAT and authorisation from the DFFE should be obtained to remove, cut, or destroy any of the above-mentioned protected and/or threatened species before any vegetation clearing may take place.

CONCLUDING REMARKS

The Thicket Patches Sub-Unit is currently experiencing major threats from AIPs and the Calcareous Grassland is experiencing transformation, to a lesser extent from AIPs but also anthropogenic activities (e.g., roads and wind farm infrastructure), therefore this habitat unit as a whole is not in a good ecological condition. However, the presence and/or high POC for SCC's makes this Habitat Unit of significant importance from a floral ecological and resource management perspective.

Important considerations:

- The POC for SCC is medium-high with one confirmed SCCs within this Habitat Unit. Based on the observation of a sensitive species within the Thicket Patches Sub-Unit and the expected favourable conditions within this Habitat-Unit, the potential occurrence of this SCC within this Habitat Unit this Habitat Unit has an higher floral importance than the other Habitat Units discussed.
- The floral diversity was high within this particular habitat unit due to the presence of dense patches of vegetation.
- The Habitat Unit is experiencing some extreme effects of AIPs, this could lead to further encroachment contaminating larger extents of this Habitat Unit creating an area for concern.
- No additional presence of unique landscapes was identified within this habitat unit.

If the proposed activities for this OHPL is approved, the following key considerations should be considered:

- The extent and abundance of AIPs is widespread within this habitat unit. For this reason, concern of spread and/or introduction within the surrounding habitat units during the construction and operational phases of the proposed project is higher. It is therefore important that edge effects be mitigated, and an AIP management plan must be devised and implemented.
- Loss of significant biodiversity elements and protected species is a concern during all phases of the OHPL proposed activities. The sensitive species found on site require the acquisition of a permits

Please refer to **Section 4** for a description of habitat sensitivity and **Section 5** for the anticipated impacts to this habitat unit.

3.2.4 Transformed Areas

HABITAT OVERVIEW	
Representative habitat photos	   

SPECIES OVERVIEW	HABITAT OVERVIEW
While the areas surrounding the transformed habitat (> 2 meters away from the current servitude and other built-up areas) show the same characteristics of their parent Habitat Unit which is not representative of the vegetation unit in which they occur, these areas have a noticeable abundance of AIPs. ➢ **AIPs** included the particularly prominent *Acacia cyclops, Opuntia ficus-indica* and other problem plant species such as *Vachelia karroo* (an indigenous encroacher) and *Gomphrena celosiodes* (problematic weed in disturbed and especially overgrazed habitat).	This Sub-Unit occurred throughout the extent of the proposed OHPL . Most of the vegetation cover within this habitat unit has been removed (i.e., cleared). These areas are a threat to the surrounding habitat units since the abundance and mobility of AIPs are more pronounced within these areas. Surrounding each "**Transformed Area**" there is a 1 m impact buffer which can account for continuous disturbance or high probability of disturbance due to the proposed OHPL activities through either spread of AIPs and/or presence of erosion (throughout construction and operational phases).

Refer to **Appendix B – Table B1** for a list of species recorded within this Sub-Unit (and those to follow) by STS and **Appendix B – Table B2** for the list of species recorded for the relevant QDS.	This habitat unit refers to all the roads, fences, built-up areas, and power within the Investigation Area. The habitat unit thus includes all areas which are no longer in a natural or near natural state. The presence of AIPs and problem plants are indicative of land degradation taking place within this Habitat Unit.

SPECIES OF CONSERVATION CONCERN AND PRESENCE OF UNIQUE LANDSCAPES (CBAs, ESAs, PROTECTED AREAS, INDIGENOUS FOREST, ECT)	
Presence of Unique Landscapes	According to the Screening Tool, the Terrestrial Sensitivity for the entire study area is considered to be **Very High**. The triggered sensitivity features include: - **CBA**: The Transformed Areas are not representative of any reference vegetation type which they occur in and is therefore not regarded as an "irreplaceable site" nor a Critically Endangered Ecosystem (ECBCP). Therefore, the CBA 1 was not confirmed for these habitat sub-units; and - **ESA**: Transformed Areas do not represent significant natural corridors or potential climate refugia sites therefore they can not be identified as ESAs. Therefore, the expected ESA 1 is not confirmed. - **Centres of Plant Endemism**: the full extent of the OHPL is located within the Albany Centre of endemism (ECBCP, 2007), after the field assessment no endemic species were identified and therefore based on these results, these Sub-Units were not identified as important representatives of the Albany Centre. No CBA or ESA was identified for the Transformed Areas therefore the Screening Toll outcome was not confirmed for this Sub-Unit
Species of Conservation Concern	No threatened/endangered species was found within this Habitat Unit (not one from the Screening Tool), in terms of Section 56(1) of the NEMBA, TOPS List for South Africa, or nationally protected tree species under the NFA. The medium sensitivity for the plant species theme (screening tool outcome) is triggered by the POC of plant SCC: however due to the degraded nature of these areas, the POC was negligible-low and therefore this result did not confirm the Screening Tool outcome.

CONCLUDING REMARKS

From a floral ecological and resource management perspective, this habitat unit is not important, nor does it contribute to important ecological processes in the landscape.

- The Habitat Unit is experiencing some extreme effects regarding AIPs, which could lead to further encroachment contaminating larger extends of this Habitat Unit, creating area for concern.

If the proposed activities for this OHPL is approved, the following key considerations should be considered:

- The abundance of AIPs represented by *Opuntia ficus-indica* (NEMBA Category 1b) and *Acacia cyclops* (NEMBA Category 1b) without proper management and monitoring can potentially become wide-spread and be introduced to surrounding natural areas. It is therefore important that edge effects be mitigated, and an AIP management plan be devised and implemented. For the proposed activities of the OHPL.

Please refer to **Section 4** for a description of habitat sensitivity and **Section 5** for the anticipated impacts to this habitat unit.

3.2.5 Freshwater Habitat

Habitat Sub-Units: Other Drainage Features (including preferential flow paths); and Watercourse Habitat (including various river systems, their associated tributaries episodic drainage lines, and ephemeral drainage lines).

<table>
<tr><th colspan="3">FRESHWATER HABITAT</th></tr>
<tr><td>Representative habitat photos</td><td colspan="2">   </td></tr>
<tr><th>SPECIES OVERVIEW</th><th colspan="2">HABITAT OVERVIEW</th></tr>
<tr><td>The Other Drainage Feature Sub-Unit had a high graminoid cover but overall low species diversity.

➢ Woody species mainly absent with Vachellia karroo being the dominant tree cover;
➢ Graminoid species include Setaria verticillata, Digitatria eranthia, Chloris virgata and Eragrostis ciliansis;</td><td colspan="2">The Other Drainage Feature Sub-Unit occurred within the middle sections of the proposed OHPL and the Watercourse Sub-Unit throughout the entire extent of the OHPL.

The outcome of the Freshwater Ecological Report (SAS 202292, 2022) indicate that the Investigation Area is associated with several watercourses as defined in the National Water Act, 1998 (Act No. 36 of 1998) (NWA)[10], which include the various river systems and their associated tributaries, as well as episodic drainage lines and ephemeral drainage lines with riparian vegetation[11].</td></tr>
</table>

[10] In terms of the definition contained within the National Water Act, 1998 (Act No. 36 of 1998), a watercourse means:

- A river or spring; and
- A natural channel which water flows regularly or intermittently; and
- A wetland, dam, or lake into which, or from which, water flows; and
- Any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse; and

[11] **Riparian habitat** as per the National Water Act, 1998 (Act No. 36 of 1998): includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas.

➢ **Herbaceous** component was made up form *Cyperus congestus, Zannichellia palustris, Oncosiphon pilulifer* and *Datura stramonium;* and ➢ **Low Shrubs** included *Asparagus crassicladus* and *Azima tatracantha*. Due to restricted access to Watercourse areas, accurate species composition information regarding these sites could not be collected. Recent drought experienced in this region along with specific land management styles, may further explain the degraded state of the water catchment/collection areas. Only within the larger ephemeral riparian tributaries and rivers were changes in riparian vegetation noted from that of the surrounding terrestrial vegetation, where a mix of low tree and shrub species such comprised: ➢ **Tree and Shrubs** species was represented by *Vachellia karroo* and *Azima tetracantha.* The shrub species such as *Azima tetracantha* were also observed within the ephemeral drainage lines. Additionally, within this Sub-Unit the invasive *Opuntia ficus-indica* was abundant; and ➢ **Graminoid and Herbaceous** species such as *Setaria verticillate*, *Eragrostis cilianensis* and *Chloris virgata* were observed. *Plumbago auriculata*, was also present within the ephemeral drainage lines observed within the Thicket Patches Sub-Unit. Refer to **Appendix B – Table B1** for a list of species recorded within these Sub-Units by STS and SAS (Freshwater ecological assessment as part of the environmental authorisation process for the proposed 132kv overhead powerline associated with the existing Wolf, Skilpad and Grassridge substations, near Kariega and Kirkwood in the eastern cape province, by FEN Consulting 2022) and Appendix B – Table B2 for the list of species recorded for the relevant QDS.	The dense grass-dominated stands (associated with the Watercourse Habitat) occurring within undulating depressions in the landscape, differed in vegetation structure and species composition from the surrounding, more terrestrial habitat units. The dominant growth form within this Watercourse Sub-Unit is characterised by graminoid species with some shrub encroachment in especially the drier and more degraded sections of this habitat unit. Similar features to the Watercourse Habitat were encountered within the Investigation Area but these do not meet the definition of a watercourse as per the NWA. The Other Drainage Features habitat referred to the preferential flow paths. The Other Drainage Features habitat include low-lying areas where water will preferentially move during rain events, but the floral communities lacked typical wetland indicator vegetation. Soil forms also differed between the Watercourse and Other Drainage Features habitat – for more details refer to the FEN 20-2155 (2022) report. The areas surrounding Other Drainage Features Habitat Units were representative of surrounding Sub-Units with lower abundance of shrubs and trees present and a higher density of grasses. The desktop analysis identified several wetlands or water catchment areas for the Investigation Area; however, after ground truthing, most of these were dry or eroded from the placement of historic roads/fences and river impoundments thereby creating preferential flow paths. For more information regarding the Freshwater Habitat Units please refer to the Freshwater Ecological Assessment done by FEN Consulting for this proposed OHPL.
SPECIES OF CONSERVATION CONCERN AND PRESENCE OF UNIQUE LANDSCAPES (CBAs, ESAs, PROTECTED AREAS, INDIGENOUS FOREST, ECT)	
Presence of Unique Landscapes	According to the Screening Tool, the Terrestrial Sensitivity for the entire study area is considered to be **Very High**. The triggered sensitivity features include: - **CBA**: Since Freshwater Habitats are considered "irreplaceable sites", this confirms the presence of CBAs for the Freshwater Habitat Unit;(ECBCP) - **ESA**: The Screening Tool also identified this Habitat Unit as an ESA1, based on the presence of an ecological corridor required to connect an ecological network and a possible climate change refugia offering resilience against climate change. The Watercourse Habitat is by definition a corridor; therefore, the presence of an ESA is confirmed. However, the Other Drainage Features Sub-Unit was not considered functioning ESAs; and - **Centres of Plant Endemism**: the full extent of the OHPL is located within the Albany Centre of endemism (ECBCP, 2007), the POC for endemic species low within this Habitat Unit therefore this is possibly not a representative of the Albany Centre of Endemism. The presence of important biodiversity and conservation features as mentioned above, confirms the outcome of the Screening Tool.

Species of Conservation Concern	The Screening Tool identified the majority of the proposed OHPL route is assigned to be in a **high sensitivity** for the Plant Species Theme. The medium sensitivity is triggered by the POC of plant SCC. Since the POC is low within this habitat unit for the triggered SCC, the result from the Screening Tool cannot be confirmed. No threatened/endangered species was found within this Habitat Unit, in terms of Section 56(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) or protected trees under the NFA The POC was low for these species and therefore the Screening Tool results can not be confirmed for this Sub-Unit.

CONCLUDING REMARKS

The Other Drainage Features Sub-Unit is in a poor ecological state since it has largely been transformed (by poor land management activities or drought) therefore this area is of low floral significance. The Watercourse Sub-Unit is protected under the NWA and provides important habitat and resources in the region, thus considered of floral and ecological importance.

Important considerations:

- The POC for SCC is low within this Habitat Unit due to the degraded nature of this Habitat Unit and unsuitable environmental conditions to sustain SCCs
- The floral diversity was very low within this particular Habitat Unit;
- This Habitat Unit remains an Important ecological feature as wetlands are protected within the NWA; and
- The Habitat Unit is experiencing some effects of encroachers which considerably impact on the natural state of this Habitat Unit.

If the proposed activities for this OHPL is approved, the following key considerations should be considered:

- Wetland areas (Other Drainage Features and Watercourse Sub-Units) are protected under the NWA and therefore significant alteration and transformation is strongly discouraged.
- The presence of AIPs and encroacher species surrounding this habitat unit can be introduced to other surrounding Habitat Units during the construction and operational phases of the proposed project. It is therefore important that edge effects be mitigated, and an AIP management plan must be devised and implemented. Refer also to **Section 3.3**.

Please refer to **Section 4** for a description of habitat sensitivity and **Section 5** for the anticipated impacts to this habitat unit.

3.3 Alien and Invasive Plant (AIP) Species

South Africa is home to an estimated 759 naturalised or invasive terrestrial plant species (Richardson et al., 2020), with 327 plant species, most of which are invasive, listed in national legislation[12]. Many introduced species are beneficial, e.g., almost all agriculture and forestry production are based on alien species, with alien species also widely used in industries such as horticulture. However, some of these species manage to "escape" from their original locations, spread and become invasive. Although only a small proportion of introduced species become invasive (~0.1–10%), those that do proceed to impact negatively on biodiversity and the services that South Africa's diverse natural ecosystems provide (from ecotourism to harvesting food, cut flowers, and medicinal products) (van Wilgen and Wilson, 2018).

3.3.1 Legal Context

South Africa has released several articles of legislation that are applicable to the control of alien species. Currently, invasive species are controlled by the NEMBA Alien and Invasive Species Regulations, 2020, in Government Gazette 43735 dated 25 September 2020. AIPs defined in terms of NEMBA are assigned a category and listed within the NEMBA List of Alien and Invasive Species (2020) in accordance with Section 70(1)(a) of the NEMBA:

- **Category 1a** species are those targeted for urgent national eradication; and
- **Category 1b** species must be controlled as part of a national management programme, and cannot be traded or otherwise allowed to spread; and
- **Category 2** species are the same as category 1b species, except that permits can be issued for their usage (e.g., invasive tree species can still be used in commercial forestry, providing a permit is issued that specifies where they may be grown and that permit holders "*Unless otherwise specified in the Notice, any species listed as a Category 2 Listed Invasive Species that occurs outside the specified area contemplated in sub-regulation (1), must, for purposes of these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to Regulation 3*"); and
- **Category 3** are listed invasive species that can be kept without permits, although they may not be traded or further propagated, and must be considered a Category 1b species if they occur in riparian zones.

[12] Government Notice number 1003: Alien and Invasive Species Lists, 2020, in Government Gazette 43726 dated 18 September 2020, as it relates to the National Environmental Management Biodiversity Act, 2004 (Act No 10 of 2004).

Duty of care related to listed invasive species are referred to in NEMBA Section 73[13]. The motivation for this duty of care is both environmentally and economically driven. Management of alien species in South Africa is estimated to cost at least ZAR 2 billion (US$142 million) each year - this being the amount currently spent by the national government's DFFE - i.e., the Working for Water programme (van Wilgen, 2020). Managing AIPs early on will reduce clearing costs in the long run.

3.3.2 Site Results

The assessed areas for the Investigation Area had low diversity of AIPs. The density of most of the AIPs were moderately low; however, within the Scattered shrubland, Tree Dominated Shrubland, Thicket patches and Transformed Habitat Units, the AIP abundance was medium-high. Most of the species recorded on site (including those recorded during previous assessments) are listed category invaders for which control is required.

An AIP Control and Management Plan is recommended to accompany the proposed activities in to ensure no loss of native floral communities occur as a result of continued AIP spread.

Table 1 below lists the AIPs associated with the Investigation Area.

[13] Section 73(2): A person who is the owner of land on which a listed invasive species occurs must-

a) notify any relevant competent authority, in writing, of the listed invasive species occurring on that land;
b) take steps to control and eradicate the listed invasive species and to prevent it from spreading; and
c) take all the required steps to prevent or minimise harm to biodiversity.

Table 1: Dominant alien floral species identified during the field assessment with their invasive status as per NEMBA: Alien and Invasive Species Lists, GN R1003 of 2020.

Scientific name (Common Name)	Origin	NEMBA Category	Habitat Unit Species Occurred in	Environmental Impacts[14]
Acacia cyclops	**Southern Western Australia**	**1b**	Thicket Patches	A. cyclops produces large quantities of litter which leads to increased soil nitrogen content (Weber, 2003), and Witkowski, (1991) concluded that the nitrogen status of the fynbos and strandveld ecosystems is elevated by the invasion of alien Acacia species. A. cyclops is also reported to use high volumes of water, ranking highest in its water consumption among the top twenty-five invader plant species in South Africa (Anon., 2003), and Working for Water (2003) suggest that the loss of native plants to A. cyclops thickets leaves the soil bare and vulnerable to wind and water erosion.
Opuntia ficus-indica	**The Americas**	**1b**	Low Growing Shrublands, Scattered Bush clumps, Sundays Valley Thicket, Calcareous Grasslands and Thicket Patches	*O. ficus-indica* can out-compete all other vegetation. The invasion process is exacerbated by selective grazing of stock on the few remaining native plants which eventually results in monocultures of O. ficus-indica with a dramatic loss of biodiversity

List of Problem Plant species and species considered indicators of veld degradation identified during the field assessment (Brimilow, 2018).

- *Vachellia karroo*
- *Tragus berteronianus*
- *Tribulus terrestris*
- *Gomphrena celosiodes*
- *Agave americana*

[14] Data sourced from the Invasive Species South Africa (ISSA) website: http://invasives.org.za/

4 SENSITIVITY MAPPING

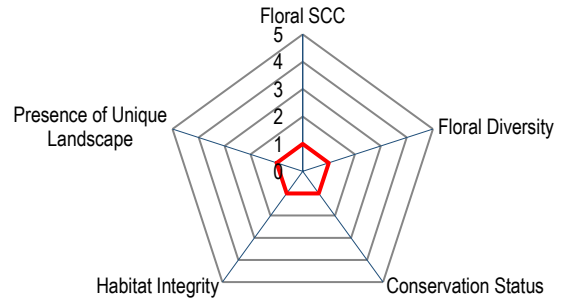
The Screening Tool identified the Investigation Area to be within a **Medium Sensitivity** area for the Plant Species Theme this sensitivity is based on the presence of suitable habitat areas for threatened and/or rare species. The outcome of the Screening Tool was confirmed for only the Scattered Bush Clumps, Sundays Valley Thicket and Thicket Patches Sub Units.

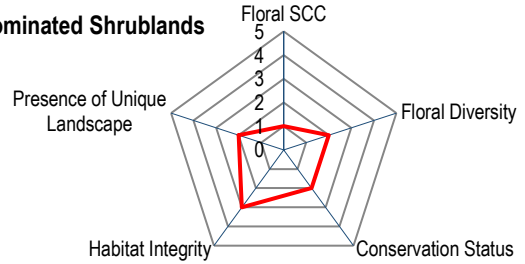
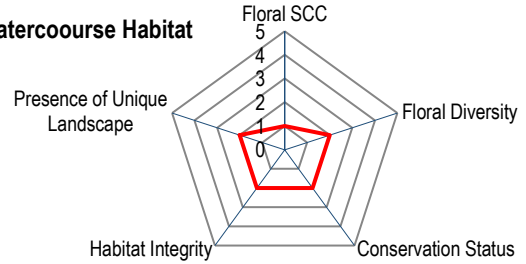
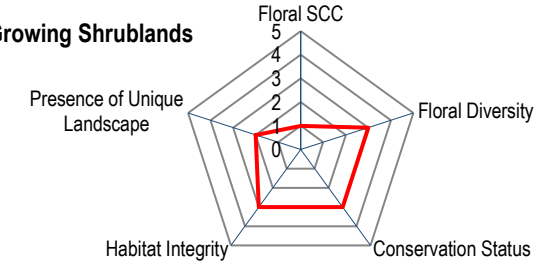
Majority of the western and mid-portion of the Investigation Area is assigned a **Very High** terrestrial sensitivity by the Screening Tool. The very high sensitivity is attributed to the presence of a CBA 1, a CBA 2, an ESA 1, Freshwater Ecosystem Priority Area (FEPA) Sub-catchments and an EN ecosystem. A smaller area in the eastern portion is of low terrestrial sensitivity. The presence of CBAs and ESAs could not be confirmed for most of the habitat units however, for Scattered Bush Clumps, Thicket Patches Sub-Units and Freshwater Habitat Unit CBA of the Screening Tool was confirmed. Based on the ECBCP areas within a CBA 1 or Biodiversity Land Management Classes (BLMC 2 based on the ECBCP) the recommended land use objective is stated as follows: “Maintain biodiversity in near natural state with minimal loss of ecosystem integrity. No transformation of natural habitat should be permitted”. Furthermore, only the Sundays Valley Thicket and Watercourse Habitat Units could be confirmed as a possible ESA.

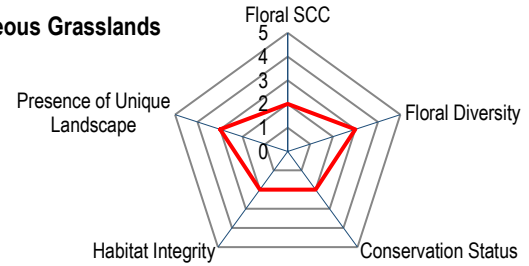
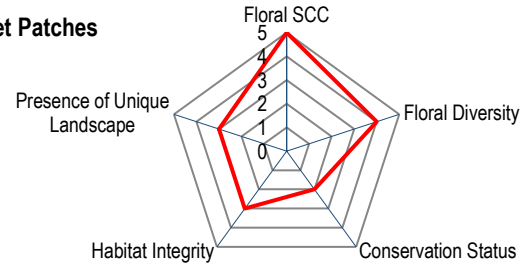
After ground truthing of the Investigation Area, a sensitivity rating was determined for each of the Habitat Units identified on site. This was based on the confirmed habitat for SCC (SCC species listed on the IUCN Red List of Threatened Species or South African’s National Red List website as CR, EN or VU according to the IUCN Red List 3.1. Categories and Criteria), Floral Diversity within the Habitat Unit compared to a reference state, Conservation Status, Habitat Integrity (presence of AIP, fragmentation, disturbance etc.) and the Presence of Unique Landscapes.

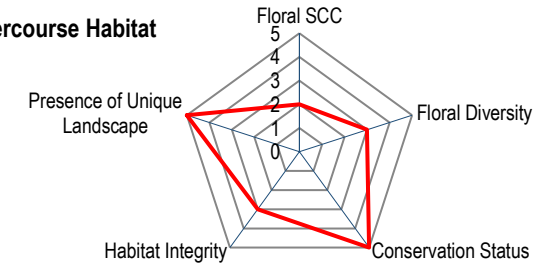
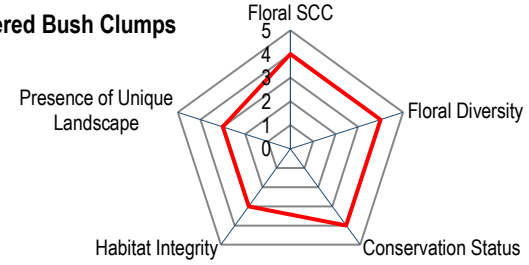
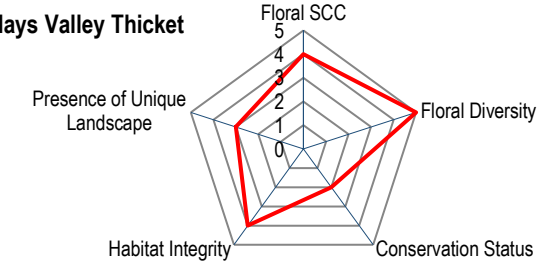
Based on the ground-truthed results of the site visit, Table 2 below presents the sensitivity of each identified habitat Sub-Unit along with an associated conservation objective. Figures 16 - 29 conceptually illustrates the areas considered to be of varying ecological sensitivity and how they will be impacted by the proposed OHPL.

Table 2: A summary of the sensitivity of each habitat unit and implications for development.

HABITAT SENSITIVITY	CONSERVATION OBJECTIVE	HABITAT UNIT	KEY HABITAT CHARACTERISTICS
Low 	Optimise development potential.	**Transformed Areas**	- Presence of AIP species common and often abundant. - No habitat of conservation concern associated with these sections. - Habitat often lacking vegetation cover. - Low to negligeable potential for SCC to establish viable populations.

HABITAT SENSITIVITY	CONSERVATION OBJECTIVE	HABITAT UNIT	KEY HABITAT CHARACTERISTICS
Moderately Low **Tree Dominated Shrublands**  **Non-Watercoourse Habitat**  **Low Growing Shrublands**  	Optimise development potential while improving biodiversity integrity of surrounding natural habitat and managing edge effects.	**Tree Dominated Shrublands** **Other Drainage Features** **Low Growing Shrublands** **Calcareous Grasslands**	- No floral SCC observed within this habitat unit, and low POC. - Grazing pressures have impacted graminoid abundance altering the habitat integrity. - AIPs present and have the potential to spread. - No CBA or ESA areas within these Sub-Units

HABITAT SENSITIVITY	CONSERVATION OBJECTIVE	HABITAT UNIT	KEY HABITAT CHARACTERISTICS
Clacareous Grasslands 			
Intermediate **Thicket Patches** 	Preserve and enhance biodiversity of the habitat unit and surrounds while optimising development potential.	**Thicket Patches**	- POC for SCC medium (with additional threatened species presence confirmed). - Due to presence of encroacher species and AIPs the habitat integrity is compromised as a result of the transformed habitat conditions. - This vegetation Sub-Unit is representative of the reference state and was therefore confirmed as CBA's.

HABITAT SENSITIVITY	CONSERVATION OBJECTIVE	HABITAT UNIT	KEY HABITAT CHARACTERISTICS
Moderately high			
Watercourse Habitat  **Scattered Bush Clumps**  **Sundays Valley Thicket**  	Preserve and enhance the biodiversity of the habitat unit, limit development and disturbance.	**Watercourse Habitat** **Scattered Bush Clumps** **Sundays Valley Thicket**	- Suitable habitat for SCCs is typically present within these habitat sub-units. - Habitat confirmed to be of conservation significance due to the presence of CBAs and ESAs with Watercourse Sub-Unit confirmed as both CBA and ESA and Scattered Bush Clump only being a confirmed CBA and Sundays Valley Thicket only a confirmed ESA (sometimes in a modified state, but still contributing towards meeting biodiversity targets). - Threatened ecosystem confirmed for the Scattered Bush Clumps. - AIPs are present within these Sub-Units but not dominant or abundant within these units. - Habitat integrity largely intact, supporting near natural ecological processes.

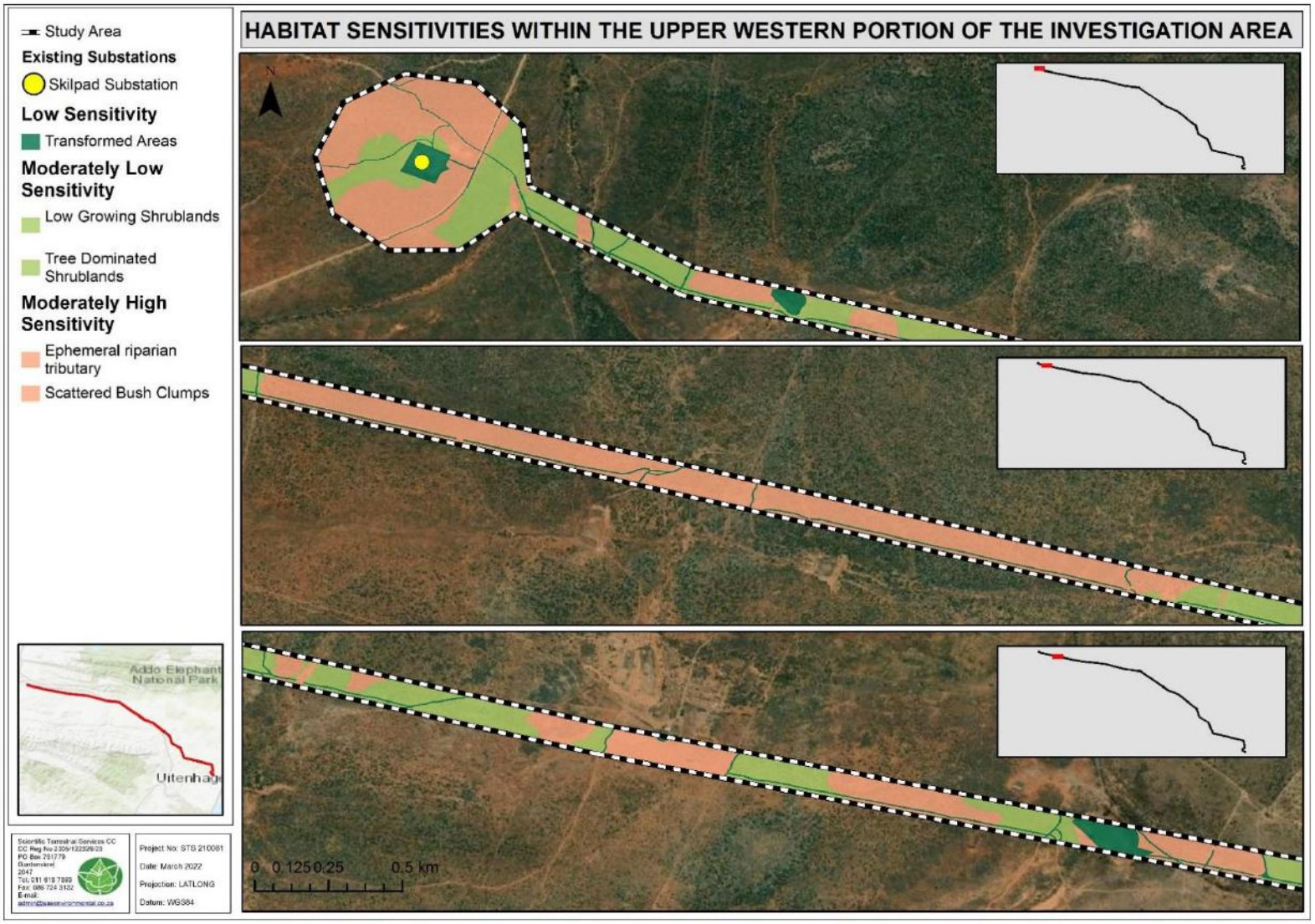


Figure 16: Distribution of Sensitivity Habitat Units along the OHPL upper Western portion

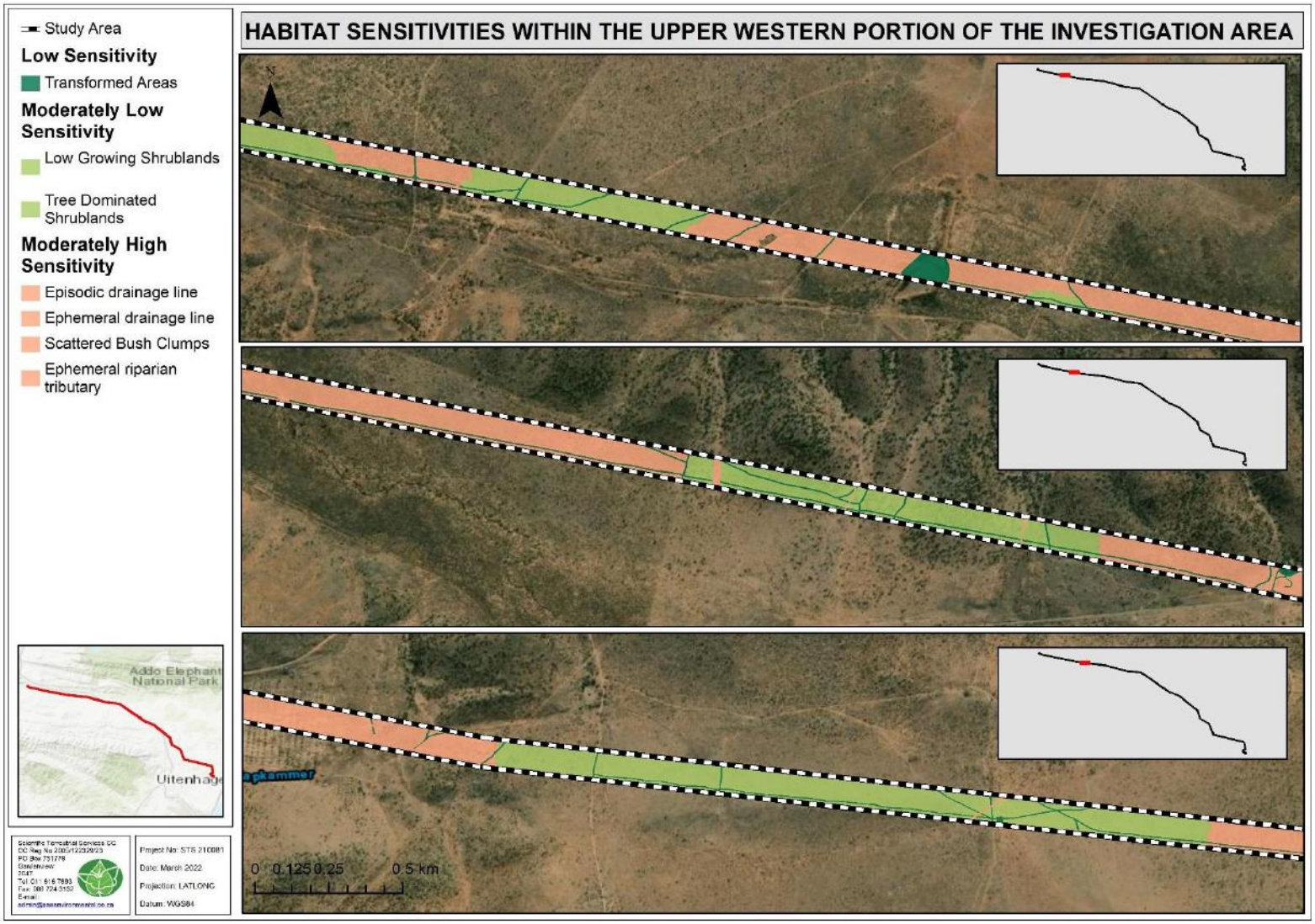


Figure 17: Distribution of Sensitivity Habitat Units along the OHPL upper Western portion

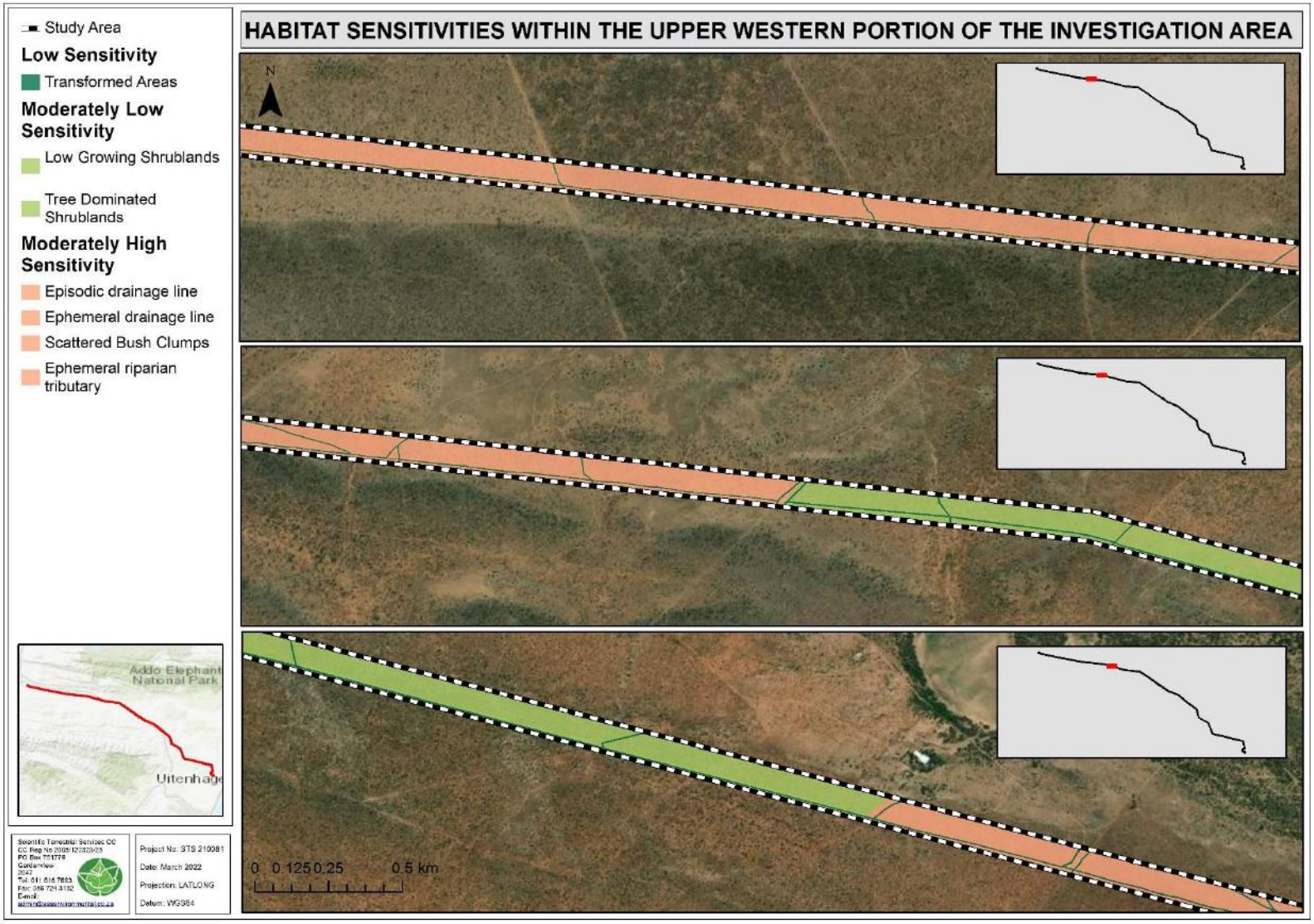


Figure 18: Distribution of Sensitivity Habitat Units along the OHPL upper Western portion.

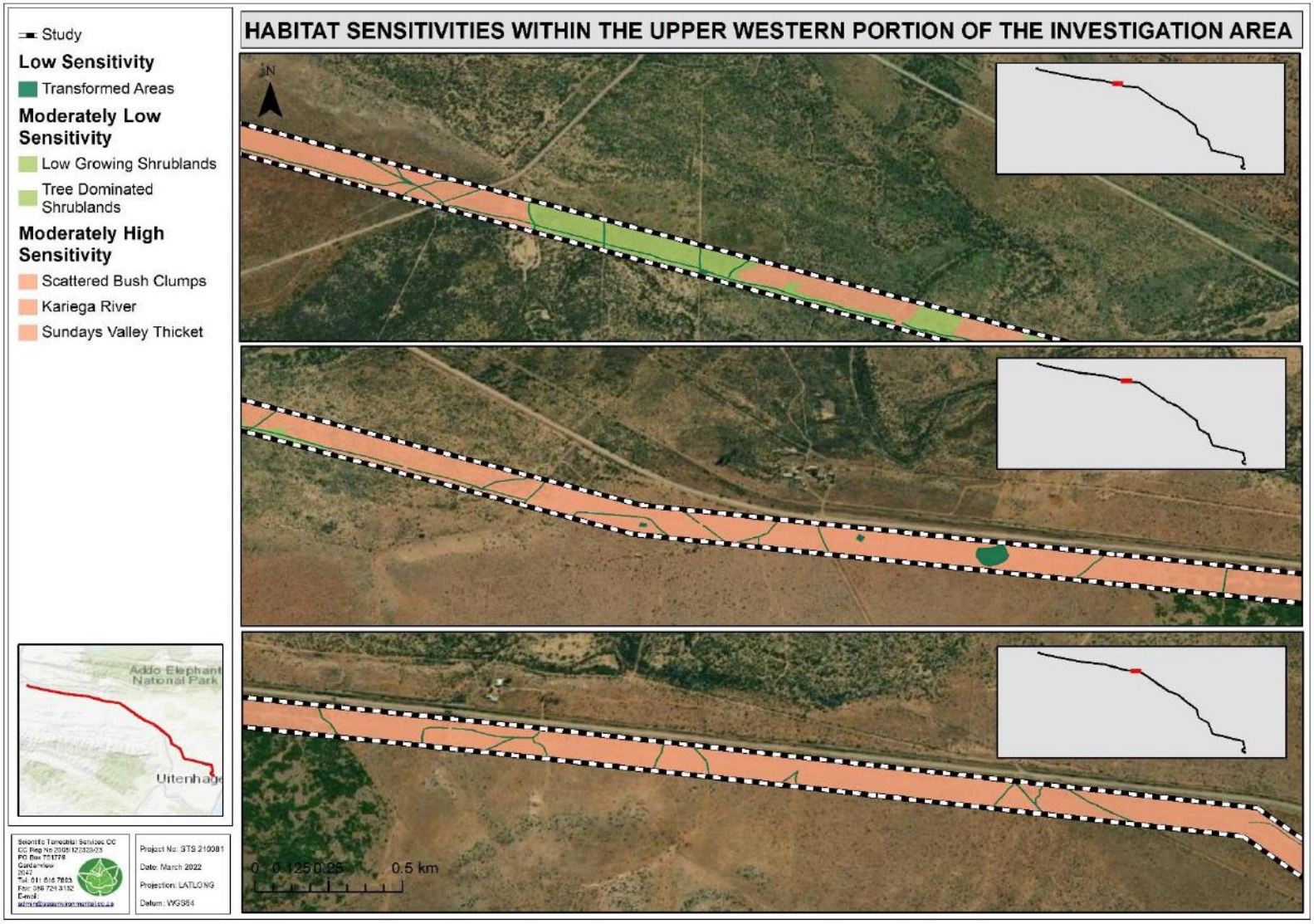


Figure 19 Distribution of Sensitivity Habitat Units along the OHPL upper Western portion section two.

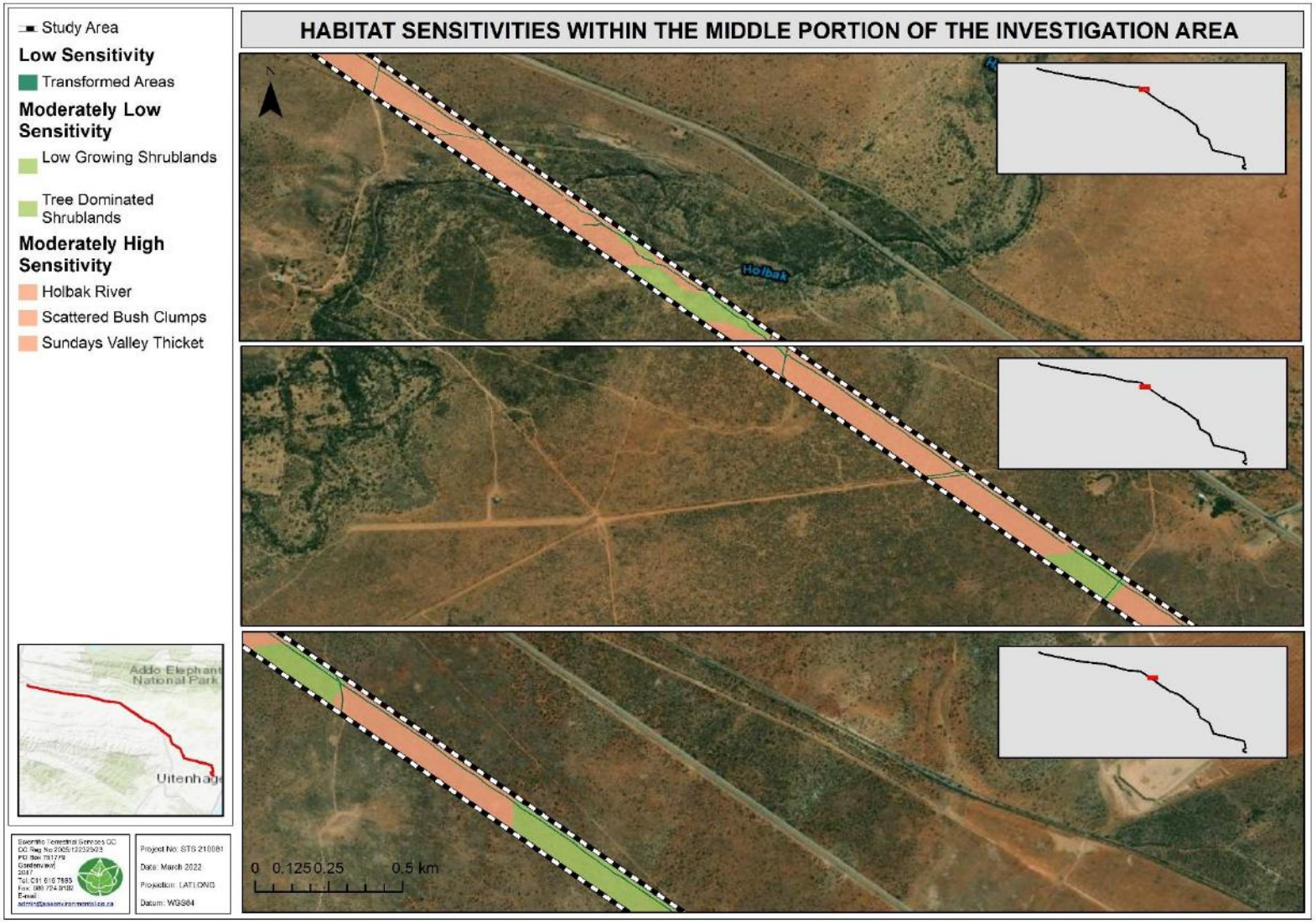


Figure 20: Distribution of Sensitivity Habitat Units along the OHPL upper Western portion section three.

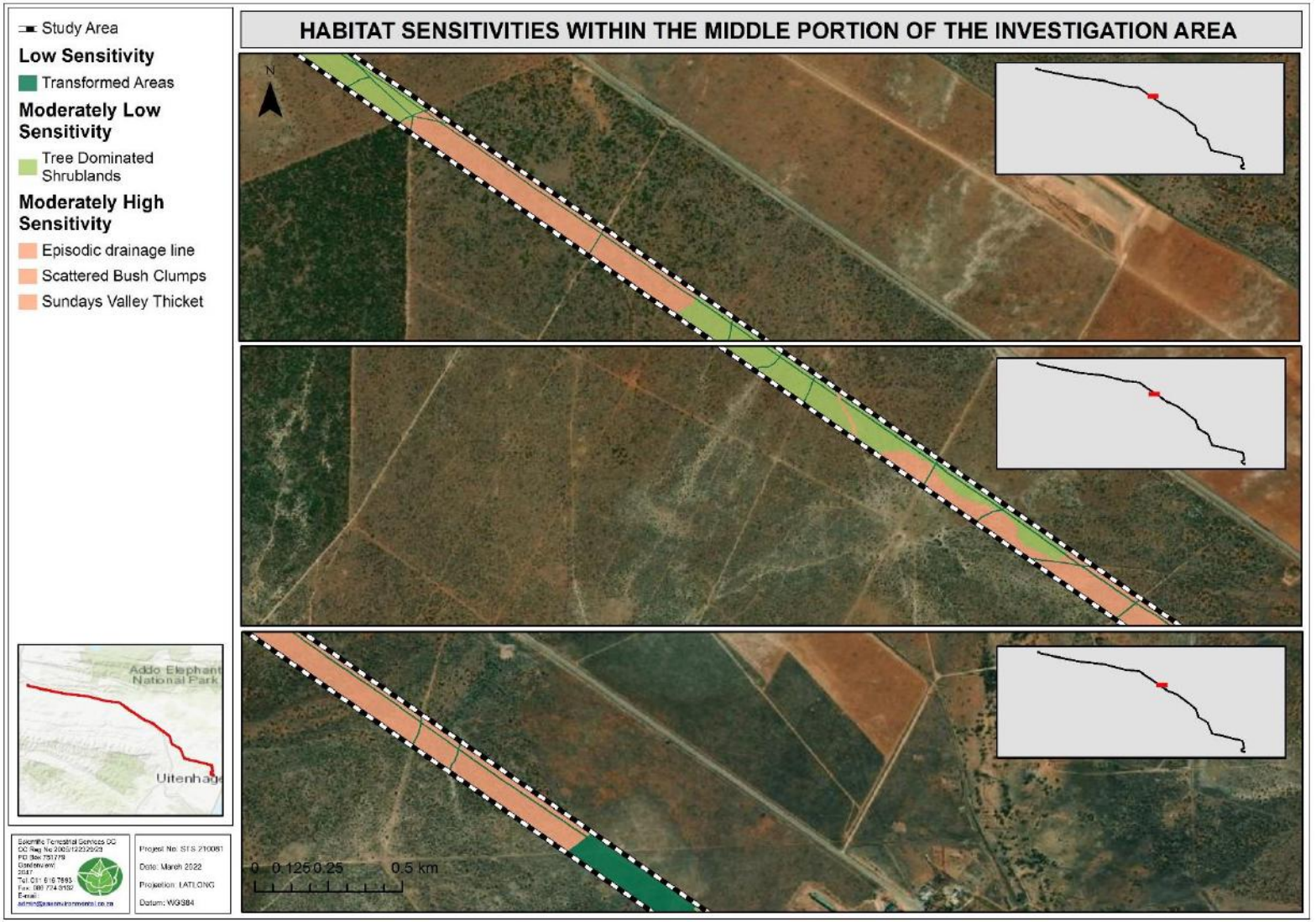


Figure 21: Distribution of Sensitivity Habitat Units along the OHPL upper Western portion section four.

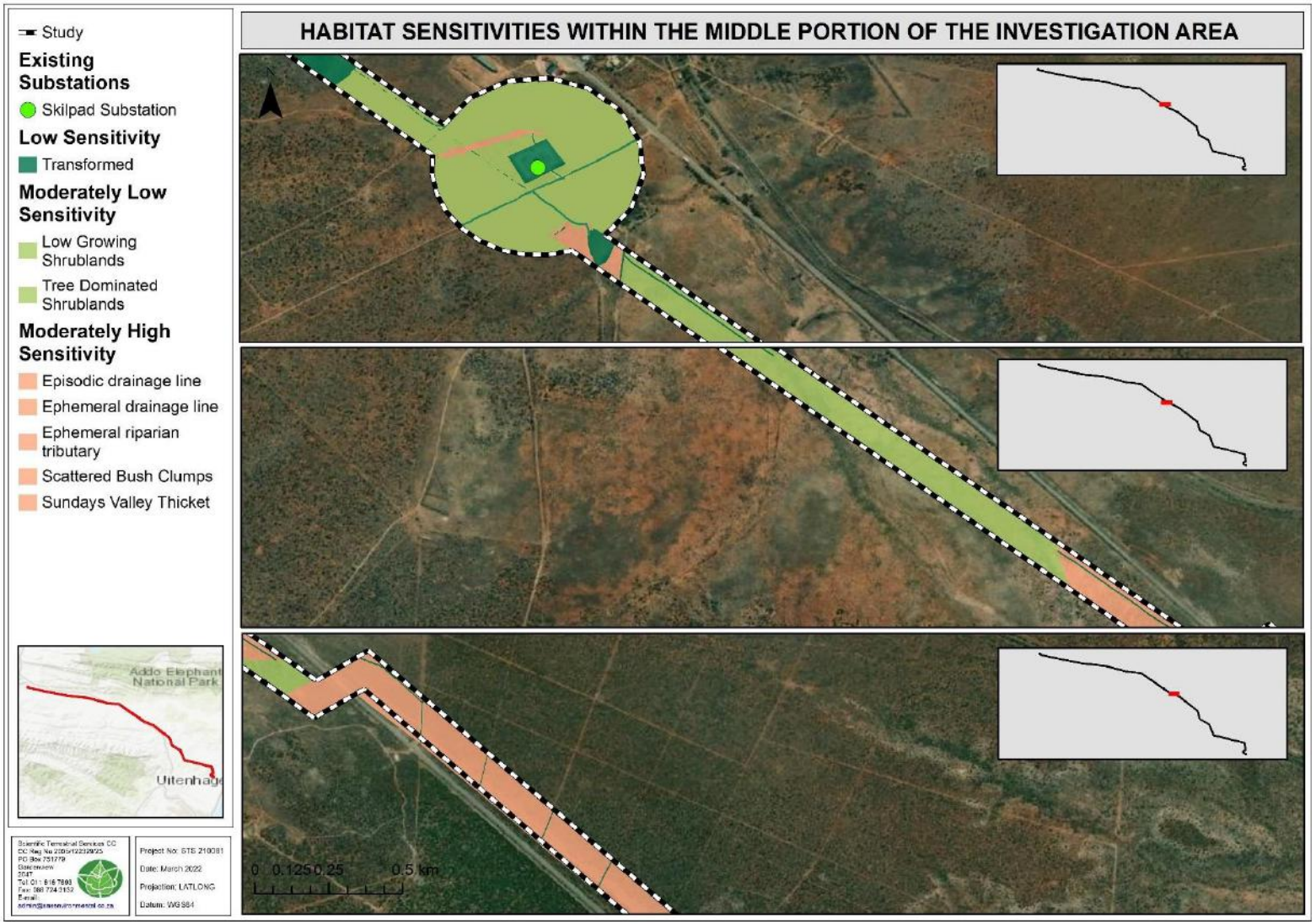


Figure 22: Distribution of Sensitivity Habitat Units along the OHPL upper Western portion section five.

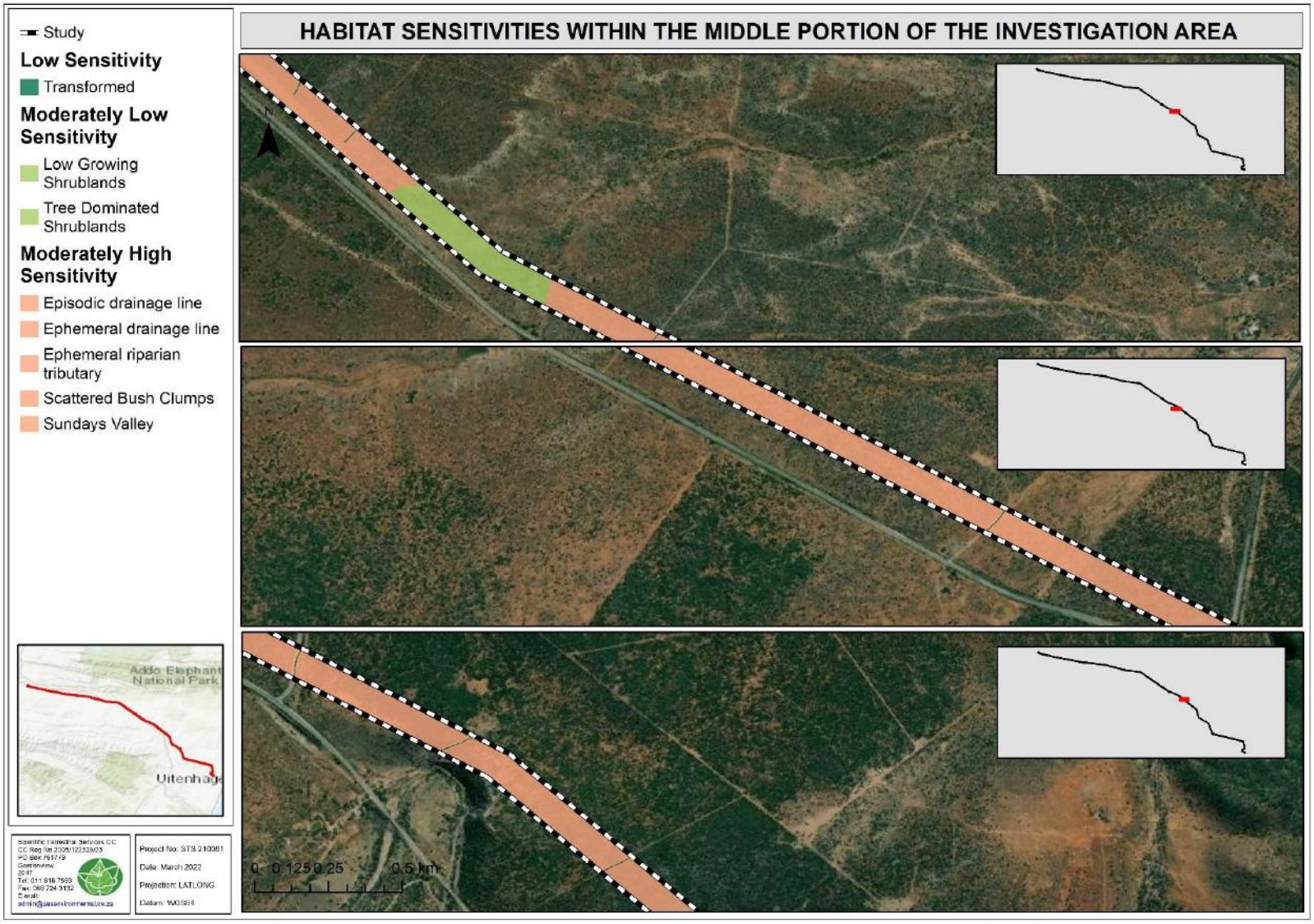


Figure 23: Distribution of Sensitivity Habitat Units along the OHPL located in the Middle portion.

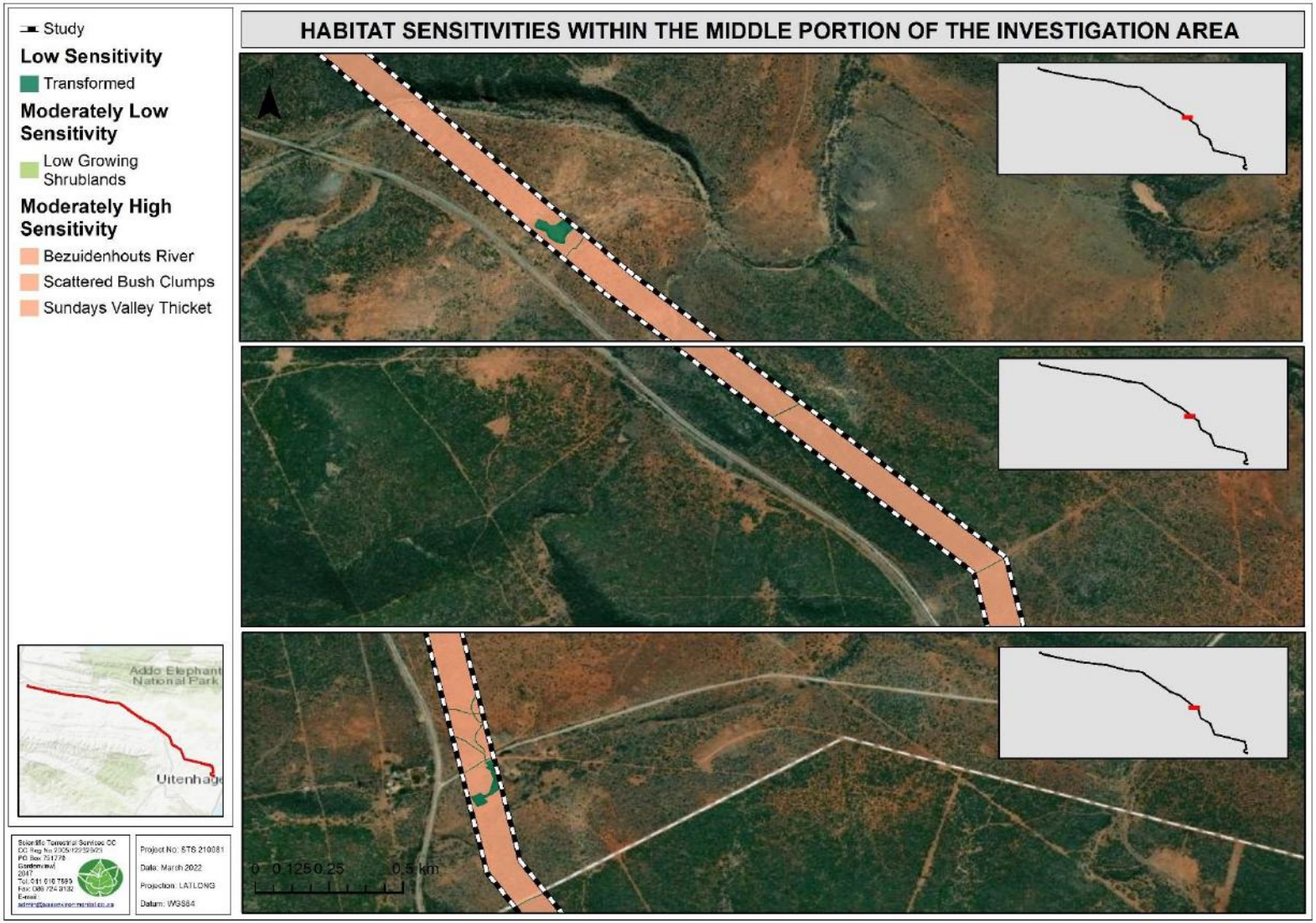


Figure 24: Distribution of Sensitivity Habitat Units along the OHPL located in the Middle portion section two.

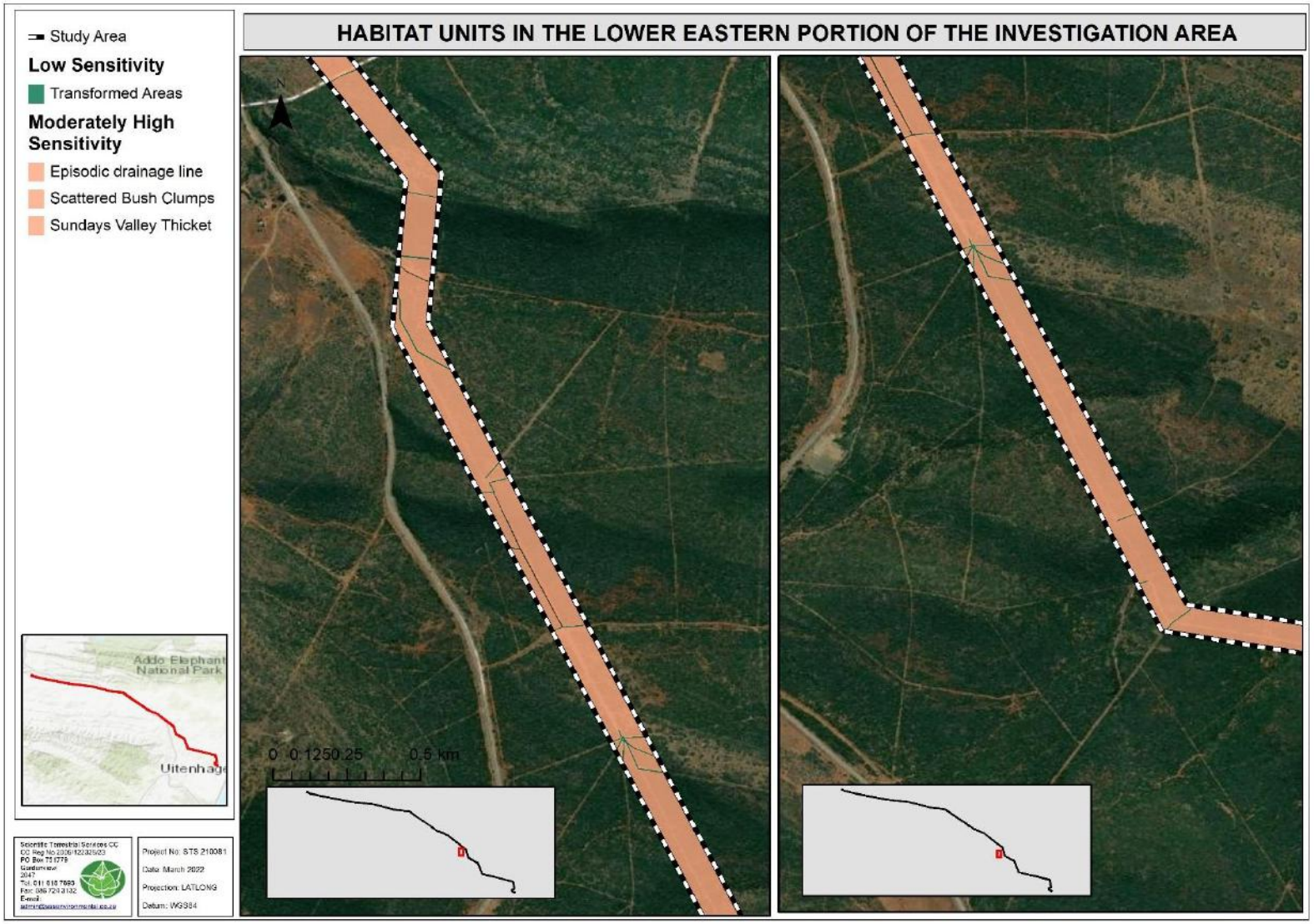


Figure 25: Distribution of Sensitivity Habitat Units along the OHPL located in the Middle portion section three.

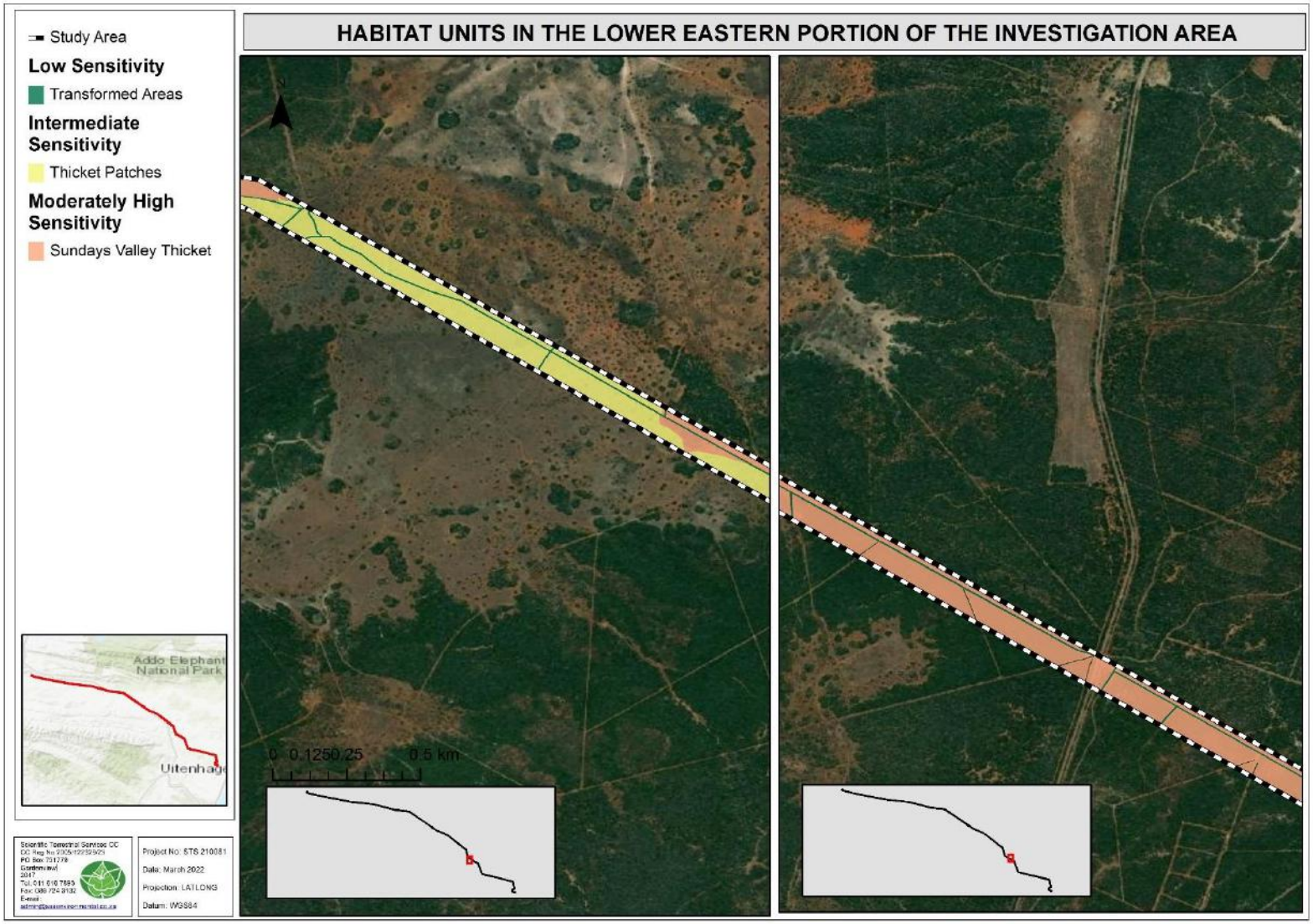


Figure 26: Distribution of Sensitivity Habitat Units along the OHPL located in the Lower Eastern portion .

Figure 27: Distribution of Sensitivity Habitat Units along the OHPL located in the Lower Eastern portion section two.

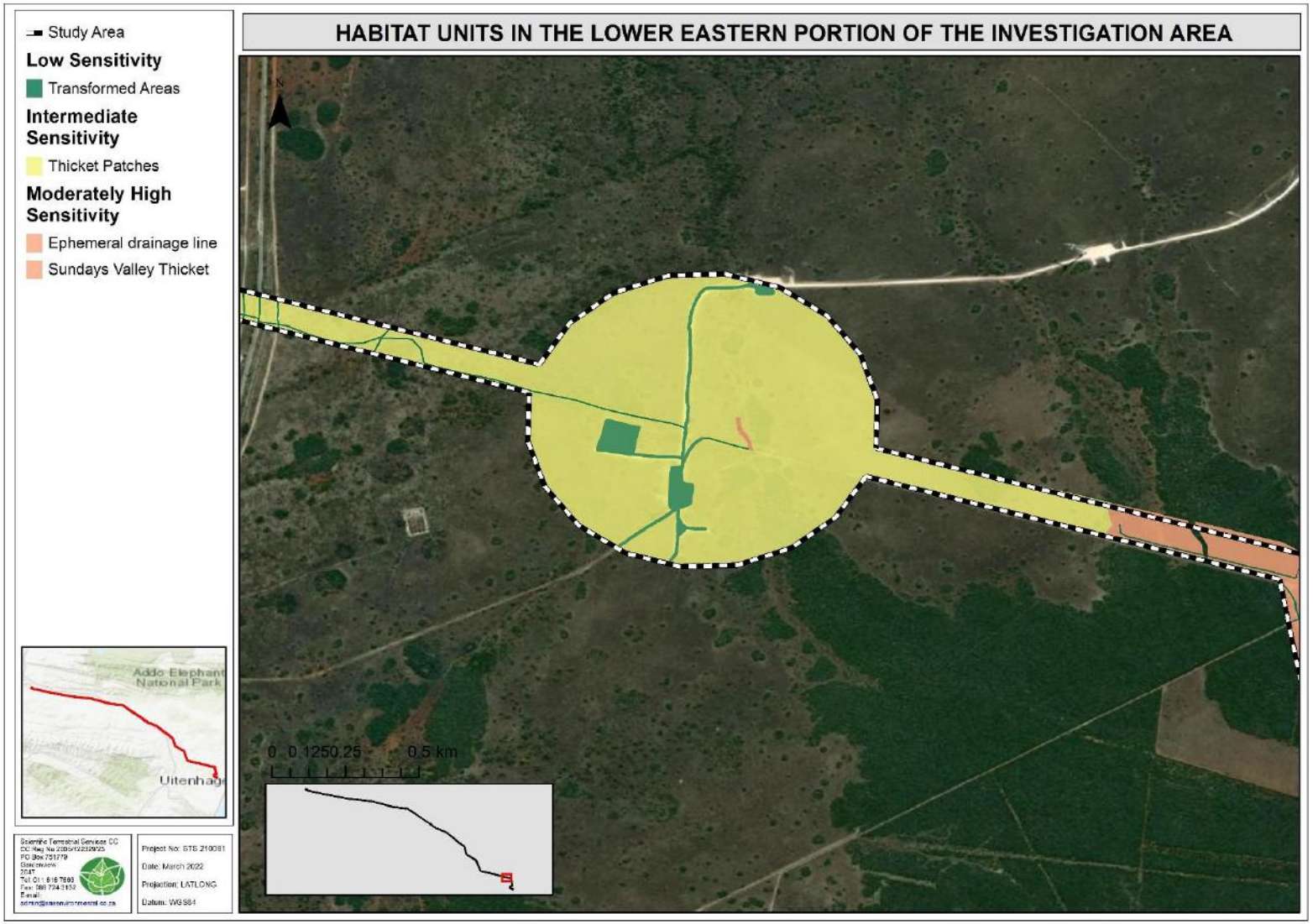


Figure 28: Distribution of Sensitivity Habitat Units along the OHPL located in the Lower Eastern portion section three.

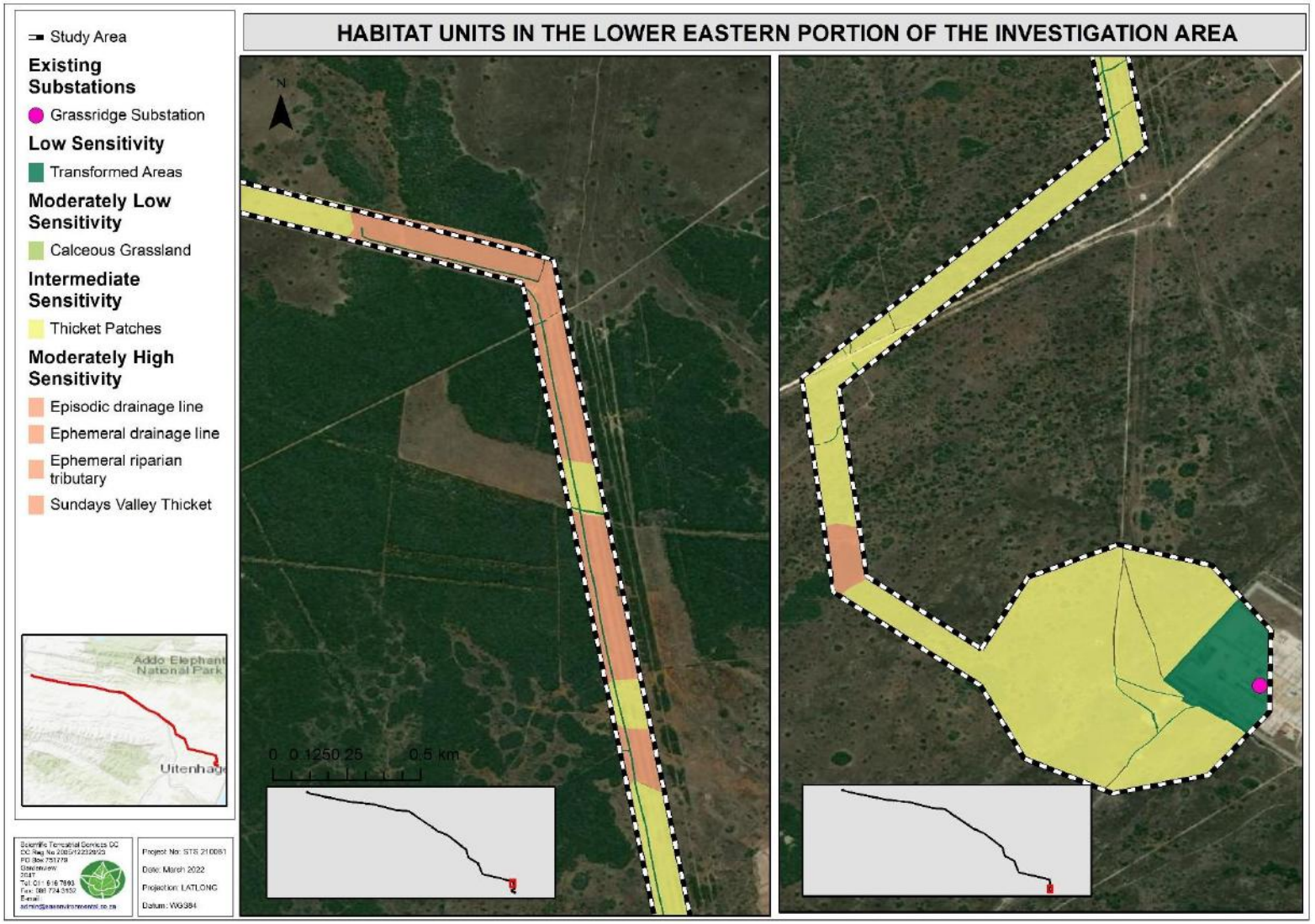


Figure 29: Distribution of Sensitivity Habitat Units along the OHPL located in the Lower Eastern portion section four.

5 IMPACT ASSESSMENT

The sections below provide the significance of perceived impacts arising from the proposed development for the Investigation Area.

An impact discussion and assessment of the construction and operational/maintenance activities are provided in Section 5.2. All mitigatory measures required to minimise the perceived impacts are presented at the bottom of each impact analysis table.

Proposed Activity Description**:**

The current update of the Terrestrial Biodiversity solely focused on the Investigation Area and the potential impacts within each delineated habitat unit. For a depiction of the proposed layout, refer to **Figure 1 in Part A**.

5.1. Floral Impact Assessment Results

The below tables indicate the perceived risks to the floral ecology associated with all phases of the proposed project. The table also provides the findings of the impact assessment undertaken with reference to the perceived impacts prior to the implementation of mitigation measures and following the implementation of mitigation measures. Key integrated mitigation measures that are applicable to the proposed project are presented in the below tables and are required to suitably manage and mitigate the ecological impacts that are associated with all phases of the proposed activities.

The mitigated results of the impact assessment have been calculated on the premise that all mitigation measures as stipulated in this report are adhered to and implemented. Should such actions not be adhered to, it is highly likely that post-mitigation impact scores will increase.

5.2. Impact Discussion

The sections below provide the significance of perceived impacts arising from the proposed development of the OHPL powerline construction and maintenance process.

The proposed OHPL Activities will inevitably impact the terrestrial ecology within the footprint areas as a result of vegetation clearance and earthworks. A large extent of the proposed OHPL (especially the upper western and middle portion of the OHPL) will occur within current servitude areas with minimal additional disturbance. Within these areas, the expansion activities are expected to have minimal impacts to the receiving environment and the species therein; instead, with mitigation measures implemented, the impacts can be adequately minimised to remain site-specific to local in extent. However, some areas within the proposed distribution of the OHPL is considered CBA and/or ESA and some include the presence of a Sensitive Species (SS, i.e., protected and/or threatened). These habitat units are therefore of

more concern during each phase of the proposed OHPL activities. Habitat units of particular concern especially those relating to pre-mitigation conditions is the Watercourse Habitat (e.g., wetlands), Sundays Valley Thicket and Thicket Patches vegetation Sub-Unit (especially during the construction and operation/maintenance phases). However, most habitat units will only experience negligible-minor negative effects post mitigation.

For floral habitat and diversity, the construction phase will have the greatest direct and immediate impacts on the surrounding environment. Impacts on protected floral species will be higher during the construction and operational phases. Avoidance of impacts on SCC population genetics and dynamics will, however, not be entirely possible. Impacts during the construction and operational phase can be reduced to lower impact significance on floral SCC given that sufficient monitoring of these individuals is implemented. To be sure that none of these SSCs are present within sites with a medium-high POC a more in-depth assessment of the flora needs to be undertaken or at least a walk down once final footprint locations have been decided especially in Habitat Units with higher POC.

5.2.1. Impacts on Floral Diversity and Habitat Integrity

Most significant impacts to affect the floral habitat integrity and species diversity associated with the OHPL Activities include, but are not limited to, the following (also see Table 4-6):

- Vegetation clearing within areas not previously cleared (i.e,. new pylon footprint), especially concerning the presence of a SS within the Thicket Patches Habitat Unit;
- Increase risk of erosion - resulting in loss of soils, the down-slope sedimentation of habitat and the consequent loss of habitat beyond the planned footprint; and
- AIP proliferation and woody encroachment into natural vegetation, displacing indigenous flora and altering favourable habitat conditions for the establishment of indigenous species; and

The below tables (Table 3-6) provides the extent of each habitat unit that will be impacted by the various aspects of the Investigation Area.

5.2.2. Impacts on Floral SCC

Activities which are likely to negatively affect the flora of conservation concern within and around the OHPL Activities include, but are not limited to, the following (refer to Table 7-9):

- Placement of infrastructure within floral SCC habitat; and
- Construction (i.e., of the new infrastructure) and operation and maintenance removing or harvesting of floral SCC during construction and operational activities; and
- Potentially poorly implemented and monitored and protection of the Sensitive Species that will be affected by the proposed project.

- Areas transformed either temporarily and/or permanently by the activities limit suitable habitat sites for the occurrence of SCC and risk of future AIP introductions threatened the continue safety of these individuals.

Two threatened species, Sensitive Species 1268 (EN) and Strelitzia junce (VU), was recorded on site (Thicket Patches Sub-Unit and Sundays Valley Thicket Habitat Unit), the habitat was deemed suitable to support threatened floral species and this aligned with the outcome of the Screening Tool which produced a High Sensitivity for the Plant Species Theme.

The Investigation Area is, however, associated with habitat that supports provincially and nationally protected floral SCC. The proposed activities will therefore directly impact on these species' numbers within the footprint area. The SCC recorded on site includes species protected under the NCNCA (Schedule 1 and 2) and the NFA. Schedule 1 and 2 Protected Species require permits from the DENC before vegetation clearing can commence. Species of geophytes and succulents are good candidates for rescue and relocation, and it is recommended that where these species will be cleared as part of site preparation activities or maintenance activities, they rather be relocated to suitable, similar habitat outside of the proposed footprint area.

However, in the case of the Sensitive Species found on site this is not an appropriate management option, it is recommended that the area surrounding this species throughout construction and operation and monitoring phase of the OHPL project be avoided. According to the Transkei Environmental Conservation Decree of 1992 all *Encephalartos* species are considered Endangered under Schedule five. The protection of endangered flora, no person shall pick or otherwise possess or be in possession of any endangered flora unless duly authorised by the Minister acting on advice of the council. Furthermore, any person contravening the provisions of subjection (1) shall be guilty of an offense and liable on conviction to a fine of not more than twenty five thousand rand or to imprisonment not exceeding two years or to both such fine and imprisonment in respect of each plant associated with the offence and the court convicting such person may in addition declare all the endangered flora in his possession, whether or not associated with the offence, forfeit to the State.

Furthermore, within the Ciskei Nature Conservation Act 1987 all *Encephalartos* species as included under Schedule 5 as specially protected Flora. The protection of specially protected flora is subject to the provisions of this Act, no person shall without permit be in possession of any specially protected flora; sell, buy, donate or receive as a donation any specially protected flora; pick any specially protected flora or introduce into, move from, or transport in or through

Ciskei any specially protected flora. Nothing in subjection to the previously mentioned regulations contained shall be construed as prohibiting the possession without a permit by any owner of private land or specially protected flora growing in a natural state on such land.

If avoiding areas with confirmed SCC localities and/or high POC of SCC is not a feasible option an alternative protection plan should be implemented to ensure the safety of this species throughout the different stage of this project.

- Alternative route and or access routes (for construction and operation/maintenance) should be considered to avoid disturbance of the area surrounding the Sensitive Species.
- The perimeter should be established as an indicator of susceptible areas that have a high POC for more/similar Sensitive Species which should be avoided and/or disturbance in this area minimised.
- Regular site visit should be maintained to ensure the effective safety protocols are in place to prevent theft or illegal relocation of Sensitive Species.

Furthermore, the Investigation Area will impact on a CBA 1, based on the suggestion from the ECBCP the following is suggested: *Maintain in a natural state (or near-natural state if this is the current condition of the site) that secures the retention of biodiversity pattern and ecological processes. For areas classified as CBA1, the following objectives must apply; Ecosystem and species must remain intact and undisturbed, since these areas demonstrate high irreplaceability, if disturbed or lost, biodiversity targets will not be met and Important: these biodiversity features are at, or beyond, their limits of acceptable change.* Therefore, although the ECBCP suggests that if land use activities are unavoidable in these areas and depending on expert opinion of the condition of the site, a Biodiversity Offset must be designed and implemented, it is the opinion of the specialist that due to the limited extend of footprint and disturbance taking place within CBA 1 and the implementation of mitigation measures as recommended in this report, lowering the impact significance on these specific CBA's, an offset investigation is not recommended.

The activities have also been determined to impact an ESA 1. This relates mostly to the **Sundays Valley Thicket** as it is recognised as an important ecological corridor by provincial conservation datasets. Based on the ECBCP, activities should maintain ecological function within the localised and broader landscape. A functional state in this context means that the area must be maintained in a semi-natural state such that ecological function and ecosystem

services are maintained. For areas classified as ESA1, the following objectives apply; These areas are not required to meet biodiversity targets, but they still perform essential roles in terms of connectivity, ecosystem service delivery and climate change resilience; these systems may vary in condition and maintaining function is the main objective. Therefore ecosystems still in natural, near natural state should be maintained and ecosystems that are moderately disturbed/degraded should be restored. In the case with the Sundays Valley Thicket, it has a high abundance of AIPs and transformed areas restoration is possible.

5.2.3. Probable Latent Impacts

Even with extensive mitigation, residual impacts on the receiving floral ecological environment are deemed likely. The following points highlight the key residual impacts that have been identified:

- Permanent loss of and altered floral species diversity;
- Edge effects such as further habitat fragmentation and AIP proliferation;
- Permanent loss of protected floral species and suitable habitat for such species;
- Ongoing bush encroachment in the adjacent natural vegetation communities; and
- Disturbed areas not rehabilitated to an ecologically functioning state with resulting significant loss of floral habitat, species diversity and SCC/protected floral species likely to be permanent.

5.2.4. Cumulative Impacts

The proposed project could further impact on the floral habitat and diversity as well as floral SCC through fragmentation of habitat units with increased biodiversity importance and sensitivity (specific reference is made to ingoing disturbance and transformation of the ESA).

AIP spread can potentially become severe if these species are not monitored and managed, especially along linear developments that typically serve as a corridor for spread. These species can potentially spread to adjacent natural areas, thus impacting on the indigenous biodiversity of the region. The abundance of **Opuntia ficus-indica, *Acacia Cyclops* and *Vachellia karroo (encroacher)* within the majority of the Investigation Area, if not cleared and controlled, will continue to spread and displace floral communities outside of the proposed impact area.

Table 3: The construction phase impacts on the floral habitat and diversity from the proposed development activities.

Vegetation Sub-Units are represented by LGS (Low Growing Shrublands), SB (Scattered Bush Clumps), TDS (Tree Dominated Shrublands), SVT (Sundays Valley Thicket), CG (Calcareous Grasslands), TP (Thicket Patches), TA (Transformed Areas), ODF (Other Drainage Features) and WC (Watercourse) Sub-Units.

Project phase	Impact	Without mitigation						With mitigation					
		Nature	Duration	Extent	Intensity	Probability	Significance	Nature	Duration	Extent	Intensity	Probability	Significance
Construction	Low Growing Shrubland- • Vegetation clearing results in a decrease in biodiversity functioning and habitat integrity due to vegetation clearing, • Spread of AIP; and • Soil erosion and degradation	Negative	Short term	Limited	Low	Certain / definite	Minor - negative	Negative	Short term	Very limited	Low	Certain / definite	Minor - negative
Construction	Scattered Bush Clumps- • Vegetation clearing results in a decrease in biodiversity functioning and habitat integrity due to vegetation clearing, • Spread of AIP; and • Soil erosion and degradation	Negative	Short term	Limited	Moderate	Certain / definite	Minor - negative	Negative	Short term	Very limited	Low	Certain / definite	Minor - negative
Construction	Tree Dominated Shrublands- • Vegetation clearing results in a decrease in biodiversity functioning and habitat integrity due to vegetation clearing, • Spread of AIP; and • Soil erosion and degradation	Negative	Short term	Limited	Moderate	Certain / definite	Minor - negative	Negative	Short term	Very limited	Low	Certain / definite	Minor - negative

Project phase	Impact	Without mitigation						With mitigation					
		Nature	Duration	Extent	Intensity	Probability	Significance	Nature	Duration	Extent	Intensity	Probability	Significance
Construction	Sundays Valley Thicket- • Vegetation clearing, decrease in biodiversity functioning and habitat integrity due to loss of vegetation cover; • Fragmentation of this Sub -Unit; • Spread of AIP ; • Loss of significant and specialised habitat conditions; and • Loss of downslope vegetation communities beyond the approved footprint areas	Negative	Short term	Municipal area	High	Certain / definite	Moderate - negative	Negative	Short term	Municipal area	Moderate	Certain / definite	Moderate - negative
Construction	Calcareous Grasslands- • Vegetation clearing results in a decrease in biodiversity functioning and habitat integrity due to vegetation clearing, • Spread of AIP; and • Soil erosion and degradation	Negative	Short term	Local	Low	Certain / definite	Minor - negative	Negative	Short term	Very limited	Very low	Certain / definite	Minor - negative
Construction	Thicket Patches- • Vegetation clearing, decrease in biodiversity functioning and habitat integrity due to loss of vegetation cover; • Spread of AIP ; and • Soil erosion and degradation	Negative	Short term	Local	High	Certain / definite	Moderate - negative	Negative	Short term	Limited	Moderate	Certain / definite	Minor - negative

Project phase	Impact	Without mitigation						With mitigation					
		Nature	Duration	Extent	Intensity	Probability	Significance	Nature	Duration	Extent	Intensity	Probability	Significance
Construction	Transformed Areas- • Vegetation clearing, decrease in biodiversity functioning and habitat integrity due to loss of vegetation cover; • Spread of AIP ; and • Soil erosion and degradation	Negative	Short term	Local	Low	Certain / definite	Minor - negative	Negative	Short term	Limited	Low	Certain / definite	Minor - negative
Construction	Other Drainage Features- • Vegetation clearing, decrease in biodiversity functioning and habitat integrity due to loss of vegetation cover; • Spread of AIP ; and • Soil erosion and degradation	Negative	Short term	Local	Moderate	Certain / definite	Minor - negative	Negative	Short term	Limited	Low	Certain / definite	Minor - negative
Construction	Watercourse- • Vegetation clearing, decrease in biodiversity functioning and habitat integrity due to loss of vegetation cover; • Spread of AIP ; and • Soil erosion and degradation	Negative	Short term	Local	High	Almost certain / Highly probable	Minor - negative	Negative	Short term	Limited	Moderate	Probable	Minor - negative

Table 4: Maintenance / Operational phase impacts on the floral habitat and diversity from the proposed development activities.

Vegetation Sub-Units are represented by LGS (Low Growing Shrublands), SB (Scattered Bush Clumps), TDS (Tree Dominated Shrublands), SVT (Sundays Valley Thicket) CG (Calcareous Grasslands), TP (Thicket Patches), TA (Transformed Areas), ODF (Other Drainage Features) and WC (Watercourse) Sub-Units

Project phase	Impact	Without mitigation						With mitigation					
		Nature	Duration	Extent	Intensity	Probability	Significance	Nature	Duration	Extent	Intensity	Probability	Significance
Operation	Low Growing Shrublands- • Regular vegetation clearing; • Decrease in biodiversity and habitat integrity due to AIP proliferation; and • Continuing erosion as a result of ongoing activities	Negative	Long term	Local	Very low	Probable	Minor - negative	Negative	Long term	Very limited	Negligible	Probable	Negligible - negative
Operation	Scattered Bush Clumps- • Regular vegetation clearing; • Decrease in biodiversity and habitat integrity due to AIP proliferation; and • Continuing erosion as a result of ongoing activities	Negative	Long term	Limited	Very low	Almost certain / Highly probable	Minor - negative	Negative	Long term	Very limited	Negligible	Likely	Negligible - negative
Operation	Tree Dominated Shrublands- • Regular vegetation clearing; • Decrease in biodiversity and habitat integrity due to AIP proliferation; and • Continuing erosion as a result of ongoing activities	Negative	Long term	Limited	Low	Almost certain / Highly probable	Minor - negative	Negative	Long term	Very limited	Very low	Likely	Minor - negative
Operation	Sundays Valley Thicket- • Regular vegetation clearing; • Decrease in biodiversity and habitat integrity due to AIP proliferation; and • Continuing erosion as a result of ongoing activities	Negative	Long term	Local	Moderate	Almost certain / Highly probable	Minor - negative	Negative	Long term	Limited	Moderate	Likely	Minor - negative

Project phase	Impact	Without mitigation						With mitigation					
		Nature	Duration	Extent	Intensity	Probability	Significance	Nature	Duration	Extent	Intensity	Probability	Significance
Operation	Calcareous Grasslands- • Regular vegetation clearing; • Decrease in biodiversity and habitat integrity due to AIP proliferation; and • Continuing erosion as a result of ongoing activities	Negative	Long term	Limited	Low	Almost certain / Highly probable	Minor - negative	Negative	Long term	Very limited	Very low	Likely	Minor - negative
Operation	Thicket Patches- • Regular vegetation clearing; • Decrease in biodiversity and habitat integrity due to AIP proliferation; and • Continuing erosion as a result of ongoing activities	Negative	Long term	Limited	Low	Almost certain / Highly probable	Minor - negative	Negative	Long term	Very limited	Very low	Likely	Minor - negative
Operation	Transformed Areas- • Decrease in biodiversity and habitat integrity due to AIP proliferation; and • Continuing erosion as a result of ongoing activities	Negative	Long term	Limited	Very low	Almost certain / Highly probable	Minor - negative	Negative	Long term	Very limited	Negligible	Likely	Negligible - negative
Operation	Other Drainage Features- • Regular vegetation clearing; • Decrease in biodiversity and habitat integrity due to AIP proliferation; and • Continuing erosion as a result of ongoing activities	Negative	Long term	Local	Moderate	Almost certain / Highly probable	Minor - negative	Negative	Long term	Limited	Very low	Likely	Minor - negative

Project phase	Impact	Without mitigation						With mitigation					
		Nature	Duration	Extent	Intensity	Probability	Significance	Nature	Duration	Extent	Intensity	Probability	Significance
Operation	Low Growing Shrublands- • Regular vegetation clearing; • Decrease in biodiversity and habitat integrity due to AIP proliferation; and • Continuing erosion as a result of ongoing activities	Negative	Long term	Local	Very low	Probable	Minor - negative	Negative	Long term	Very limited	Negligible	Probable	Negligible - negative

Table 5: Construction phase impacts on the floral SCC from the proposed development activities.

Vegetation Sub-Units are represented by LGS (Low Growing Shrublands), SB (Scattered Bush Clumps), TDS (Tree Dominated Shrublands), SVT (Sundays Valley Thicket), CG (Calcareous Grasslands), TP (Thicket Patches), TA (Transformed Areas), ODF (Other Drainage Features) and WC (Watercourse) Sub-Units

Project phase	Impact	Without mitigation						With mitigation					
		Nature	Duration	Extent	Intensity	Probability	Significance	Nature	Duration	Extent	Intensity	Probability	Significance
Construction	Low Growing Shrublands- • Loss of vegetation due to vegetation clearing compromising possible habitats for SCC; and • Spread of AIPs limiting the natural extent for SCC.	Negative	Short term	Limited	Low	Probable	Negligible - negative	Negative	Short term	Very limited	Very low	Unlikely	Negligible - negative
Construction	Scattered Bush Clumps- • Loss of vegetation due to vegetation clearing compromising possible habitats for SCC; and • Spread of AIPs limiting the natural extent for SCC.	Negative	Short term	Local	Moderate	Almost certain / Highly probable	Minor - negative	Negative	Short term	Limited	Low	Likely	Minor - negative
Construction	Tree Dominated Shrublands- • Loss of vegetation due to vegetation clearing compromising possible habitats for SCC; and • Spread of AIPs limiting the natural extent for SCC.	Negative	Short term	Limited	Very low	Probable	Negligible - negative	Negative	Short term	Very limited	Negligible	Unlikely	Negligible - negative
Construction	Sundays Valley Thicket- • Loss of SCC and RDL; • Restriction of habitat extent and favourable sites for other SCC that have a high POC; and • Spread of AIPs replacing natural vegetation;	Negative	Short term	Local	High	Certain / definite	Moderate - negative	Negative	Short term	Local	Moderate	Almost certain / Highly probable	Minor - negative

Project phase	Impact	Without mitigation						With mitigation					
		Nature	Duration	Extent	Intensity	Probability	Significance	Nature	Duration	Extent	Intensity	Probability	Significance
Construction	Calcareous Grasslands- • Loss of vegetation due to vegetation clearing compromising possible habitats for SCC; and • Spread of AIPs limiting the natural extent for SCC.	Negative	Short term	Local	Low	Probable	Minor - negative	Negative	Short term	Very limited	Very low	Probable	Negligible - negative
Construction	Thicket Patches- • Loss of SCC and RDL; • Restriction of habitat extent and favourable sites for other SCC that have a high POC; and • Spread of AIPs replacing natural vegetation;	Negative	Short term	Local	High	Certain / definite	Moderate - negative	Negative	Short term	Local	Moderate	Almost certain / Highly probable	Minor - negative
Construction	Transformed Areas- • Spread of AIPs; and • vegetation clearing	Negative	Short term	Local	Moderate	Likely	Minor - negative	Negative	Short term	Limited	Low	Probable	Negligible - negative
Construction	Other Drainage Features- • Vegetation clearing, loss of potential SCC habitat; and • Spread of AIPs	Negative	Short term	Limited	Moderate	Probable	Minor - negative	Negative	Short term	Limited	Low	Probable	Negligible - negative
Construction	Watercourse- • Vegetation clearing, loss of potential SCC habitat; and • Spread of AIPs	Negative	Short term	Limited	Very low	Probable	Negligible - negative	Negative	Short term	Very limited	Negligible	Unlikely	Negligible - negative

Table 6: Maintenance / Operational phase impacts on the floral SCC from the proposed development activities.

Vegetation Sub-Units are represented by LGS (Low Growing Shrublands), SB (Scattered Bush Clumps), TDS (Tree Dominated Shrublands), SVT (Sundays Valley Thicket),CG (Calcareous Grasslands), TP (Thicket Patches), TA (Transformed Areas), ODF (Other Drainage Features) and WC (Watercourse) Sub-Units

Project phase	Impact	Without mitigation						With mitigation					
		Nature	Duration	Extent	Intensity	Probability	Significance	Nature	Duration	Extent	Intensity	Probability	Significance
Operation	Low Growing Shrubland- • Regular vegetation clearing removing possible SCC habitat; and • Loss of available habitat for SCC due to AIP proliferation and potential harvesting.	Negative	Long term	Local	Very low	Likely	Minor - negative	Negative	Long term	Very limited	Negligible	Probable	Negligible - negative
Operation	Scattered Bush Clumps- • Regular vegetation clearing removing possible SCC habitat; and • Loss of available habitat for SCC due to AIP proliferation and potential harvesting.	Negative	Long term	Limited	Moderate	Likely	Minor - negative	Negative	Long term	Limited	Low	Likely	Minor - negative
Operation	Tree Dominated Shrublands- • Regular vegetation clearing removing possible SCC habitat; and • Loss of available habitat for SCC due to AIP proliferation and potential harvesting.	Negative	Long term	Limited	Low	Probable	Minor - negative	Negative	Long term	Very limited	Very low	Unlikely	Negligible - negative
Operation	Sunday Valley Thicket – • Regular vegetation clearing destroying SCC and SCC habitat; and • Loss of available habitat for SCC due to AIP proliferation and potential harvesting.	Negative	Long term	Local	Moderate	Certain / definite	Moderate - negative	Negative	Long term	Local	Moderate	Almost certain / Highly probable	Minor - negative

Project phase	Impact	Without mitigation						With mitigation					
		Nature	Duration	Extent	Intensity	Probability	Significance	Nature	Duration	Extent	Intensity	Probability	Significance
Operation	Calcareous Grasslands- • Regular vegetation clearing removing possible SCC habitat; and • Loss of available habitat for SCC due to AIP proliferation and potential harvesting.	Negative	Long term	Limited	Low	Likely	Minor - negative	Negative	Long term	Very limited	Very low	Probable	Negligible - negative
Operation	Thicket Patches- • Regular vegetation clearing; and • Loss of available habitat for SCC due to AIP proliferation and potential harvesting.	Negative	Long term	Local	Moderate	Certain / definite	Moderate - negative	Negative	Long term	Limited	Moderate	Almost certain / Highly	Minor - negative
Operation	Transformed Areas- • Regular vegetation clearing removing possible SCC habitat; and • Loss of available habitat for SCC due to AIP proliferation and potential harvesting.	Negative	Long term	Limited	Very low	Unlikely	Negligible - negative	Negative	Long term	Very limited	Negligible	Unlikely	Negligible - negative
Operation	Other Drainage Features- • Regular vegetation clearing removing possible SCC habitat; and • Loss of available habitat for SCC due to AIP proliferation and potential harvesting.	Negative	Long term	Local	Low	Unlikely	Negligible - negative	Negative	Long term	Limited	Very low	Unlikely	Negligible - negative
Operation	Watercourse- • Regular vegetation clearing removing possible SCC habitat; and • Loss of available habitat for SCC due to AIP proliferation and potential harvesting.	Negative	Long term	Limited	Low	Probable	Minor - negative	Negative	Long term	Very limited	Negligible	Unlikely	Negligible - negative

6. CONCLUSION

STS was appointed to conduct a Biodiversity Assessment as part of the IEA process for the proposed overhead powerline, between Qqeberha and Kleinpoort in the Eastern Cape province. The intention of this project is to replace the existing powerline, by constructing additional/new infrastructure and removing the current infrastructure when installation is complete. The impact of the proposed construction of new infrastructure, access roads and maintenance of servitude was studied.

Habitat summaries and sensitivities:

Based on the results of the field investigation of February 2022 by STS, nine broad habitat units were distinguished for the Investigation Area:

- **Low Growing Shrublands.** This habitat unit is considered to be in a poor natural condition based on a floral perspective. This habitat Unit did not confirm to the reference vegetation state and therefore did not confirm the results from the Screening Tool. Based on field assessment this Habitat Unit was classified as **Moderately Low** sensitivity due to the habitat integrity, effect of grazing and extent of AIPs; and
- **Scattered Bush clumps.** This habitat unit was determined to have a medium-high POC for SCCs therefore this Sub-Unit is considered important from a floristic perspective. Furthermore, this Sub-Unit was confirmed to be CBA1 therefore its designated sensitivity is **Moderately High**; and
- **Tree Dominated Shrublands.** From field assessment this habitat unit was observed to be in a poor natural state, due to the high abundance of AIPs and extensive grazing effects therefore the designated sensitivity was **Moderately Low**; and
- **Sundays Valley Thicket.** This habitat unit was confirmed to be an ESA and had two confirmed SCC and a medium-high POC for other SCCs therefore this habitat unit was identified as **Moderately High** sensitivity. Dense thicket vegetation with a high abundance of *Aloe species*, *Euphorbia species*, various succulent species and many herbaceous species, and could therefore possibly also reflect true endemic species relating to the Albany Centre of Endemism; and
- **Calcareous Grasslands.** Due to a small extent of this Sub-Unit and level of transformation this Sub-Unit was classified as **Moderately Low** sensitivity. This vegetation type has a relatively high species richness and is therefore of moderate importance from a floral and ecological perspective; and
- **Thicket Patches.** Representative of **Sundays Valley Thicket** (SVT) distributed within the Grassridge Bontveld vegetation unit this Sub-Unit is described as having a

Intermediate sensitivity. This is based on the presence of AIPs which are widespread and decreasing the habitat integrity. However, one confirmed SCC was found on site which require some monitoring and management to ensure adequate protection.

- **Other Drainage Features Habitat Unit.** These habitat units were severely degraded by the recent drought, AIP invasions and poor land management and was therefore classified as **Moderately Low** sensitivity; and
- **Watercourse Habitat Unit.** Protected under the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA), and the National Forest Act, 1998 (Act No. 84 of 1998, as amended in September 2011) (NFA) they remain of ecological importance and was therefore classified as a **Moderately High** sensitive Sub-Unit. While these areas are in a degraded state, they remain areas of concern and should be avoided. Since ground truthing took place during/following drought conditions the true extent and conditions of the wetlands could not be properly assessed.
- **Transformed Areas.** These areas are of low concern since they have been cleared of vegetation and was therefore this area was considered as a **Low** sensitivity area, however proper maintenance and or monitoring need to be in place to ensure that these areas do not become centres with high AIPs or distribution centres for future invasions.

Impact summary

The proposed OHPL proposed powerline will inevitably impact the terrestrial ecology within the footprint areas as a result of vegetation clearance and regular disturbance during operational phase. Much of the proposed expansion will occur within habitat that is either already transformed, or which is currently in poor conditions with floral communities notably degraded. Within these areas, the expansion activities are expected to have minimal impacts to the receiving environment and the species therein; instead, with mitigation measures implemented, the impacts can be adequately minimised to remain site-specific to local in extent. Some concerns include the presence of Sensitive Species within Thicket Patches Habitat Unit.

Most significant impacts to affect the floral habitat integrity, species diversity and SCC associated with the OHPL project, but are not limited to, the following:

- Placement of infrastructure within floral SCC habitat; and
- Destruction, removal or harvesting of floral SCC during construction and operational activities; and

- Potentially poorly implemented and monitored rescue and relocation of SCC that will be affected by the proposed project, leading to unsuccessful rescue efforts and loss of SCC individuals.
- Continued expansion resulting in increasingly fragmented habitat; and
- Increase risk of erosion - resulting in loss of soils, the down-slope sedimentation of habitat and the consequent loss of habitat beyond the planned footprint; and
- AIP proliferation and woody encroachment into natural vegetation, displacing indigenous flora and altering favourable habitat conditions for the establishment of indigenous species; and

It is the opinion of the ecologists that this study provides the relevant information required to implement Integrated Environmental Management (IEM) and to ensure that the best long-term use of the ecological resources in the Investigation Area will be made in support of the principle of sustainable development.

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APPENDIX A: Floral Method of Assessment

Floral Species of Conservational Concern Assessment

Prior to the site visit, a record of floral SCC and their habitat requirements was developed for the Investigation Area, which includes consulting the National Web-based Environmental Screening Tool. Because not all SCC have been included in the Screening Tool layers (e.g., NT and Data Deficient taxa), it remains important for the specialist to be on the lookout for additional SCC. For this study, two primary sources were consulted and are described below.

The National Web-Based Environmental Screening Tool

The Screening Tool was accessed to obtain a list of potentially occurring species of conservation concern for the Investigation Area. Each of the themes in the Screening Tool consists of theme-specific spatial datasets which have been assigned a sensitivity level namely, "*low*", "*medium*", "*high*" and "*very high*" sensitivity. The four levels of sensitivity are derived and identified in different ways, e.g., for **confirmed** areas of occupied habitat for SCC a Very High and High Sensitivity is assigned and for areas of suitable habitat where SCC may occur based on spatial models only, a Medium Sensitivity is assigned. The different sensitivity ratings pertaining to the Plant [and Animal] Protocols are described below[15]:

- **Very High**: Habitat for species that are endemic to South Africa, where all the known occurrences of that species are within an area of 10 km^2 are considered Critical Habitat, as all remaining habitat is irreplaceable. Typically, these include species that qualify under Critically Endangered (CR), Endangered (EN), or Vulnerable (VU) D criteria of the IUCN or species listed as Critically/ Extremely Rare under South Africa's National Red List Criteria. For each species reliant on a Critical Habitat, all remaining suitable habitat has been manually mapped at a fine scale.

- **High**: Recent occurrence records for all threatened (CR, EN, VU) and/or rare endemic species are included in the high sensitivity level. Spatial polygons of suitable habitat have been produced for each species by intersecting recently collected occurrence records (those collected since the year 2000) that have a spatial confidence level of less than 250 m with segments of remaining natural habitat.

- **Medium**: Model-derived suitable habitat areas for threatened and/or rare species are included in the medium sensitivity level. Two types of spatial models have been included. The first is a simple rule-based habitat suitability model where habitat attributes such as vegetation type and altitude are selected for all areas where a species has been recorded to occur. The second is a species distribution model which uses species occurrence records combined with multiple environmental variables to quantify and predict areas of suitable habitat. The models provide a probability-based distribution indicating a continuous range of habitat suitability across areas that have not been previously surveyed. A probability threshold of 75% for suitable habitat has been used to convert the modelled probability surface and reduce it into a single spatial area which defines areas that fall within the medium sensitivity level.

- **Low**: Areas where no SCC are known or expected to occur.

[15] More details on the use of the Screening Tool for Species of Conservation Concern can be found in the below resources:
- South African National Biodiversity Institute (SANBI). 2020. Draft Species Environmental Assessment Guideline. Guidelines for the implementation of the Terrestrial Flora (3c) & Terrestrial Fauna (3d) Species Protocols for environmental impact assessments in South Africa. South African National Biodiversity Institute, Pretoria. Version 1.0.
- The National Web based Environmental Screening Tool website: https://screening.environment.gov.za/screeningtool/#/pages/welcome

BRAHMS Online Website (or the new Plants of Southern Africa (POSA))

The Botanical Database of Southern Africa (BODATSA) is accessed to obtain plant names and floristic details (http://posa.sanbi.org/) for species of conservation concern within a selected boundary;

- This website provides access to South African plant names (taxa), specimens (herbarium sheets) and observations of plants made in the field (botanical records). Data is obtained from the Botanical Database of Southern Africa (BODATSA), which contains records from the National Herbarium in Pretoria (PRE), the Compton Herbarium in Cape Town (NBG & SAM) and the KwaZulu-Natal Herbarium in Durban (NH).
- Information on habitat requirements etc. is obtained from the SANBI Red List of South African Plants website (http://redlist.sanbi.org/).
- Typically, data is extracted for the Quarter Degree Square (QDS) in which the Investigation Area is situated but where it is deemed appropriate, a larger area can be included.

NEMBA TOPS Species

The Threatened or Protected Species (TOPS) Regulations (2007) under Section 56(1) of the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) (NEMBA), were taken into consideration.

Provincial: Specially Protected and Protected Species

The Eastern Cape Environmental Management Bill (2019) as a further amendment to the Cape Nature and Environmental Conservation Ordinance 19 of 1974 with our specific focus being on Endangered Flora (Schedule 3) and Protected Flora (Schedule 4). Chapter 5 of the Cape Nature and Environmental Conservation Ordinance 19 or 1974 referring to the Protection of Flora is of particular importance considering the nature of our ground truth results.

Nationally Protected Trees

The National Forest Act, 1998 (Act No. 10 of 1998), as amended in September 2011 (NFA), affords protection to a list of tree species. All nationally protected trees were included as SCC in this report.

Throughout the floral assessment, special attention was paid to the identification of any of these SCC as well as the identification of suitable habitat that could potentially support these species.
The Probability of Occurrence (POC) for each floral SCC is described:

- "**Confirmed'**: if observed during the survey; and
- "**High**": if within the species' known distribution range and suitable habitat is available; and
- "**Medium**": if either within the known distribution range of the species or if suitable habitat is present; or
- "**Low**": if the habitat is not suitable and falls outside the distribution range of the species.

Low POC	Medium POC	High POC	Confirmed

The accuracy of the POC is based on the available knowledge about the species in question, with many of the species lacking in-depth habitat research.

Vegetation Surveys

When planning the timing of a floristic survey, it is important to remember that the primary objective is not an exhaustive species list but rather to ensure that sufficient data are collected to describe all the vegetation communities present in the area of interest, to optimise the detection of SCC and to assess habitat suitability for other potentially occurring SCC (SANBI, 2020).

The vegetation survey incorporates the subjective (or stratified) sampling method. Subjective sampling is a sampling technique in which the specialist relies on his or her own professional experience when

choosing sample sites within the Investigation Area. This allows representative recordings of floral communities and optimal detection of SCC. Subjective sampling is used to consider different areas (or habitat units) which are identified within the main body of a habitat/Investigation Area.

One of the problems with random sampling, another popular sampling method, is that random samples may not cover all areas of a Investigation Area equally and thus increase the potential to miss floral SCC. Random sampling methods also tend to require more time in the field to locate the amount of SCC that can be detected using subjective sampling methods - In the context of an EIA where time constraints are often restrictive, priority needs to be given to collecting data in the shortest time possible without compromising the efficiency of locating SCC (SANBI, 2020).

Vegetation structure has been described following the guideline in Edwards (1983). Refer to Figure A1.

Floral Habitat Sensitivity

The floral habitat sensitivity of each habitat unit was determined by calculating the mean of five different parameters which influence floral communities and provide an indication of the overall floristic ecological integrity, importance and sensitivity of the habitat unit. Each of the following parameters are subjectively rated on a scale of 1 to 5 (1 = lowest and 5 = highest):

- **Floral SCC:** The confirmed presence or potential for floral SCC or any other significant species, such as endemics, to occur within the habitat unit; and
- **Unique Landscapes:** The presence of unique landscapes or the presence of an ecologically intact habitat unit in a transformed region; and
- **Conservation Status:** The conservation status of the ecosystem or vegetation type in which the habitat unit is situated based on local, regional and national databases. Whether the habitat is representative of a Critical Biodiversity Area or forms part of an Ecological Support Area is also taken into consideration; and
- **Floral Diversity:** The recorded floral diversity compared to a suitable reference condition such as surrounding natural areas or available floristic databases; and
- **Habitat Integrity:** The degree to which the habitat unit is transformed based on observed disturbances which may affect habitat integrity.

Each of these values contribute equally to the mean score, which determines the floral habitat sensitivity class in which each habitat unit falls. A conservation and land-use objective is also assigned to each sensitivity class which aims to guide the responsible and sustainable utilization of the habitat unit in question. In order to present the results use is made of spider diagrams to depict the significance of each aspect of floral ecology for each vegetation type. The different classes and land-use objectives are presented in the table below:

Table A1: Floral habitat sensitivity rankings and associated land-use objectives.

Score	Rating significance	Conservation objective
1 < 1.5	Low	Optimise development potential.
≥1.5 <2.5	Moderately low	Optimise development potential while improving biodiversity integrity of surrounding natural habitat and managing edge effects.
≥2.5 <3.5	Intermediate	Preserve and enhance biodiversity of the habitat unit and surrounds while optimizing development potential.
≥3.5<4.5	Moderately high	Preserve and enhance the biodiversity of the habitat unit, limit development and disturbance.

≥4.5 ≤5.0	High	Preserve and enhance the biodiversity of the habitat unit, no-go alternative must be considered.

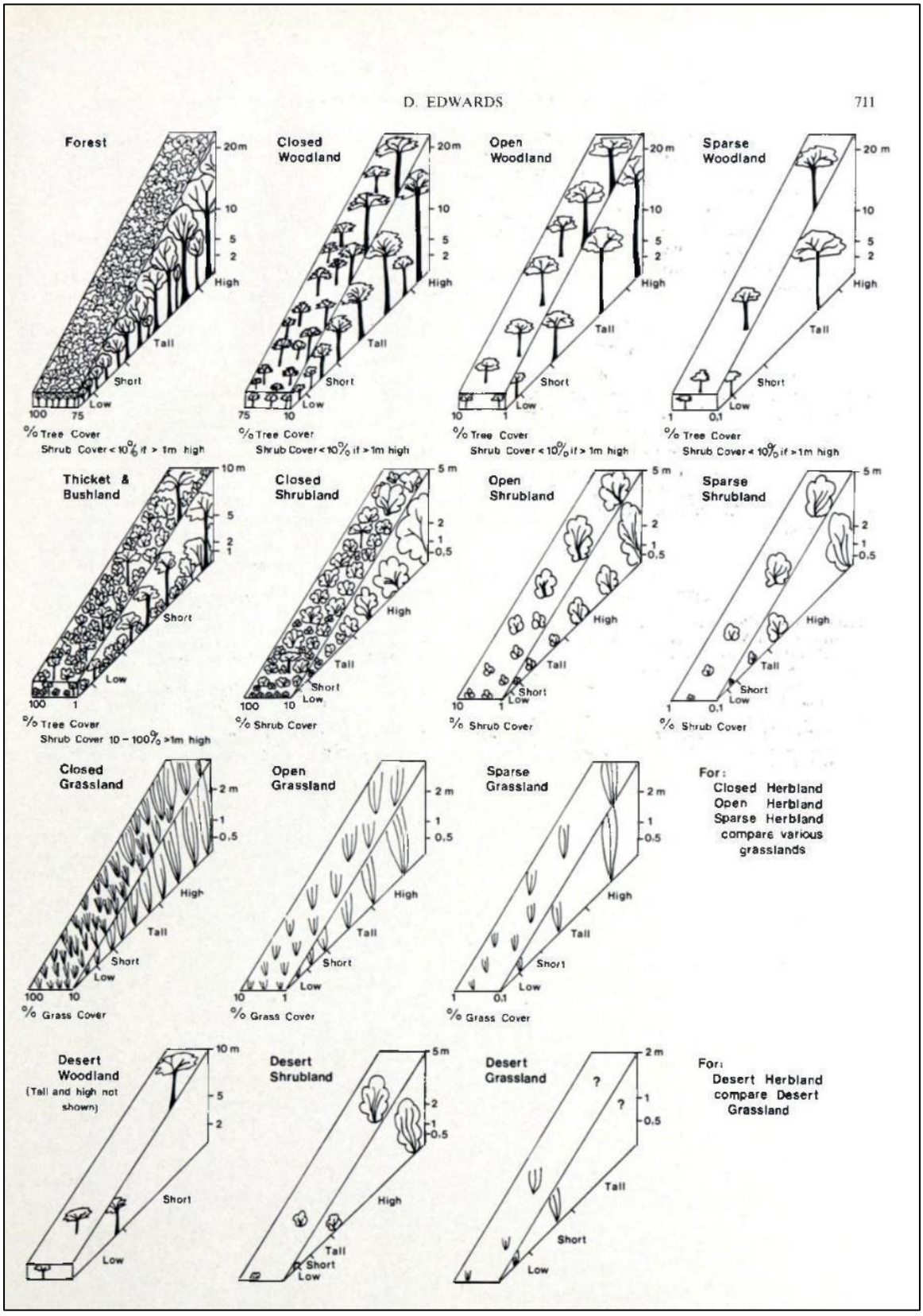


Figure A1: Diagrammatic representation of structural groups and formation classes. Only dominant growth forms are shown.

APPENDIX B: Floral Species List

Table B1: Dominant floral species encountered during the field assessment. Alien species identified during the field assessment are indicated with an asterisk (*). Protected species are emboldened.

Scientific name	Low Growing Shrubland	Scattered Bush Clumps	Tree Dominated Shrublands	Sundays Valley Thicket	Calcareous Grasslands	Thicket Patches	Freshwater	Transformed Areas
WOODY SPECIES								
**Acacia cyclops*						x		
Agave americana		x					x	
**Opuntia ficus-indica*	x	x	x	x	x	x	x	x
Agathosoma capensis								
Agathosoma gonaquensis						x		
Aloe africana			x	x	x	x		
Aloe ferox		x		x	x	x		
Aloe speciosa				x	x			
Artiplex muelleri	x	x	x					
Asparagus crassicladus		x	x			x		
Asparagus striatus						x		
Asparagus subulatus			x					
Azima tetracantha	x	x	x	x		x	x	
Blepharis capensis	x	x				x		
Boscia oleoides		x	x					
Bulbine favosa	x					x		
Bulbine frutescens		x		x				
Caputia pyramidata								
Carissa bispinosa subsp. bispinosa		x		x		x		
Carissa haematocarpa		x						
Cotyledon berbeyi				x		x		
Cotyledon orbiculata								

Scientific name	Low Growing Shrubland	Scattered Bush Clumps	Tree Dominated Shrublands	Sundays Valley Thicket	Calcareous Grasslands	Thicket Patches	Freshwater	Transformed Areas
Crassula capitella subsp. capitella				x		x		
Crassula cordata				x				
Crassula cultrata				x				
Crassula ericoides					x	x		
Crassula expansa						x		
Crassula ovata				x				
Crassula perfoliata var. coccinea				x				
Crassula perforata						x		
Crassula tetragona						x		
Cussonia gamtoosensis				x				
Cussonia spicata				x				
Datura stramanum							X	
Diospyros austroafricana	x	x						
Encephalartos horridus				x		x		
Erithtrina lysistemon								
Euclea undulata		x	x	x		x		
Euphorbia caerulescens				x				
Euphorbia esculenta	x							
Euphorbia grandidens				x				
Euphorbia mauritanica		x		x				
Euphorbia radyeri	x	x	x					
Gomphocarpus fruticosus								
Grewia robusta		x	x					
Gymnosporia capitata		x		x		x		
Gymnosporia polyacantha		x	x	x				
Helichrysum anomalum						x		
Hermannia althaeoides					x	x		
Hypoxis hemerocallidea						x		

Scientific name	Low Growing Shrubland	Scattered Bush Clumps	Tree Dominated Shrublands	Sundays Valley Thicket	Calcareous Grasslands	Thicket Patches	Freshwater	Transformed Areas
Kalanchoe rotundifolia				x	x	x		
Mesembryanthemum articulatum	x	x	x	x				
Mesembryanthemum rhizophorum			x		x	x		
Pappea capensis		x	x	x				
Plumbago auriculata				x			x	
Portulacaria afra		x	x	x				
Rhigozum obovatum								
Schotia afra var. afra		x	x	x		x		
Schotia myrtina				x				
Searsia crenata	x	x						
Searsia longispina			x	x				
Sideroxylon inerme					x	x		
Solanum tomentosum	x	x	x			x		
Tephrosia capensis					x			
Vachellia karroo		x	x				x	x
Verbesina encelioides		x						
HERBACEOUS								
Abutilon sonneratianum					x			
Ammocharis coranica							x	
Argyrobium tomentosum					x			
Berkheya heterophylla		x						
Boophone disticha						x		
Chascanum hederaceum					x			
Chironia baccifera	x				x			
Commelina africana								
Corpuscularia lehmannii						x		
Cotelydon orbiculate						x		
Crassothonna cacaloides		x	x					

Scientific name	Low Growing Shrubland	Scattered Bush Clumps	Tree Dominated Shrublands	Sundays Valley Thicket	Calcareous Grasslands	Thicket Patches	Freshwater	Transformed Areas
Crassula expansa				x				
Cyanotis speciosa								
Cyphostemma cirrhosum					x			
Cyranthus helictus								
Delosperma cloeteae	x	x	x		x			
Eriosema kraussianum								
Eriospermum ornithogaloides				x				
Eulophia ovalis var. ovalis							x	
Felecia mossamedensis								
Felicia muricata					x			
Ficinia truncata								
Glottiphylum longum			x					
Gomphrena celosioides		x	x				x	
Indigofera sessilifolia			x		x			
Jamesbrittenia microphylla					x			
Ledebouria coriacea		x				x		
Leobordea divaricata								
Leonotis listii								
Mesembryanthemum crystallinum	x	x	x					
Morella cordifolia								
Nemesia dentriculata /Monopsis decipiens cf		x						
Oncosiphon pilulifer	x						x	
Oxalis smithiana						x		
Pachypodium succulentum	x							
Pelargonium reniforme					x	x		
Rhoicissus digitata				x				
Rhombophyllum dolabriforme						x		
Sansevieria Hyacinthoides				x		x		

Scientific name	Low Growing Shrubland	Scattered Bush Clumps	Tree Dominated Shrublands	Sundays Valley Thicket	Calcareous Grasslands	Thicket Patches	Freshwater	Transformed Areas
Senecio rowleyanus						x		
Tagetes minuta					x			
Tephrosia capenesis					x			
Tribulus terrestris	x	x	x	x	x	x		
Xanthanium spinosum	x	x	x					
Zannichellia palustris		x	x				x	
GRAMINOIDS								
Aristida congesta	x		x					
Aristida diffusa		x			x	x		
Aristida junciformes						x		
Cenchrus ciliaris	x	x	x					
Chloris virgata							x	
Corpuscularia lehmannii								
Cumbopogon marginatus								
Cymbopogon pospischilii					x	x		
Cynodon dactylon	x	x	x	x		x		
Cypris congestus		x						
Cypris cyperoides								
Digitaria eriantha							x	
Eragrostis capensis								
Eragrostis cilianensis							x	
Eragrostis curvula		x		x				
Eragrostis lehmanniana		x			x			
Eragrostis obtusa	x	x		x		x		
Festuca scabra		x						
Fingerhuthia africana								
Panicum maximum	x	x	x	x				
Setaria verticillata		x					x	

Scientific name	Low Growing Shrubland	Scattered Bush Clumps	Tree Dominated Shrublands	Sundays Valley Thicket	Calcareous Grasslands	Thicket Patches	Freshwater	Transformed Areas
Sporobolus fimbriatus				x				
Sporobolus nitens					x			
Themeda triandra					x	x		
Tragus berteronianus	x	x	x		x			

Table B2: Sensitive floral species and other common species identified by BRAHMS (Botanical Research And Herbarium Management System) and TOPS within the general vicinity of the proposed OHPL distribution area. Overlap between Table B1 might occur.

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Acalypha peduncularis	LC	herb; dwarf shrub;	Indigenous
Achyranthemum argenteum		dwarf shrub;	Indigenous; Endemic
Adromischus bicolor	LC	succulent; dwarf shrub;	Indigenous; Endemic
Adromischus cristatus	LC	succulent; dwarf shrub;	Indigenous; Endemic
Adromischus sphenophyllus	LC	succulent; dwarf shrub;	Indigenous; Endemic
Afroaster hispidus	LC		Indigenous
Agathosma venusta	LC	dwarf shrub;	Indigenous; Endemic
Agrostis lachnantha	LC	graminoid;	Indigenous
Ajuga ophrydis	LC	herb;	Indigenous
Albuca setosa	LC	geophyte;	Indigenous
Aloe africana	LC	succulent; shrub; tree;	Indigenous; Endemic
Aloe pluridens	LC	succulent; shrub; tree;	Indigenous; Endemic
Amellus strigosus	LC	herb;	Indigenous; Endemic
Anacampseros albidiflora	LC	succulent; herb;	Indigenous; Endemic
Anacampseros arachnoides	LC	succulent; herb;	Indigenous; Endemic
Andropogon appendiculatus	LC	graminoid;	Indigenous
Anginon rugosum	LC	shrub;	Indigenous; Endemic
Anthospermum galioides	LC	dwarf shrub;	Indigenous; Endemic
Apodytes dimidiata	LC	shrub; tree;	Indigenous
Aponogeton desertorum	LC	epihydate; hyperhydate; hydrophyte; geophyte; herb;	Indigenous
Argemone ochroleuca		herb;	Not indigenous; Naturalised; Invasive
Argyrolobium molle	LC	herb;	Indigenous; Endemic
Argyrolobium trifoliatum	EN		Indigenous; Endemic
Aristea abyssinica	LC	herb;	Indigenous
Aristea africana	LC	herb;	Indigenous; Endemic
Aristea anceps	LC	herb;	Indigenous; Endemic
Aristea schizolaena	LC	herb;	Indigenous; Endemic

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Aristida adscensionis	LC	graminoid;	Indigenous
Aristida congesta	LC	graminoid;	Indigenous
Aristida congesta	LC	graminoid;	Indigenous
Aristida junciformis	LC	graminoid;	Indigenous
Arundinella nepalensis	LC	graminoid;	Indigenous
Aspalathus chortophila	LC	dwarf shrub; shrub;	Indigenous
Aspalathus frankenioides	LC	dwarf shrub;	Indigenous; Endemic
Aspalathus kougaensis	LC	dwarf shrub; shrub;	Indigenous; Endemic
Aspalathus setacea	LC	shrub;	Indigenous; Endemic
Aspalathus spectabilis	LC	shrub;	Indigenous; Endemic
Aspalathus spinosa	LC	shrub;	Indigenous; Endemic
Aspalathus subtingens	LC	dwarf shrub;	Indigenous; Endemic
Asparagus aethiopicus	LC	climber;	Indigenous
Asparagus crassicladus	LC	dwarf shrub;	Indigenous; Endemic
Asparagus densiflorus	LC	dwarf shrub;	Indigenous
Asparagus krebsianus	LC	dwarf shrub;	Indigenous; Endemic
Asparagus macowanii	LC	shrub;	Indigenous; Endemic
Asparagus mucronatus	LC	shrub;	Indigenous; Endemic
Asparagus oxyacanthus	LC	shrub;	Indigenous; Endemic
Asparagus recurvispinus	LC	shrub;	Indigenous; Endemic
Asparagus spinescens	LC	shrub;	Indigenous; Endemic
Asparagus striatus	LC	dwarf shrub;	Indigenous; Endemic
Asparagus suaveolens	LC	shrub;	Indigenous
Asparagus volubilis	LC	climber;	Indigenous; Endemic
Aspidoglossum heterophyllum	LC	succulent; herb;	Indigenous; Endemic
Astroloba foliolosa	LC	succulent;	Indigenous; Endemic
Atalaya capensis	LC	tree;	Indigenous; Endemic
Atriplex lindleyi			Not indigenous; Naturalised; Invasive
Atriplex nummularia			Not indigenous; Naturalised

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Atriplex semibaccata		dwarf shrub;	Not indigenous; Naturalised; Invasive
Azima tetracantha	LC	succulent; climber; dwarf shrub; shrub;	Indigenous
Barleria pungens	LC	herb; dwarf shrub;	Indigenous; Endemic
Bergeranthus concavus	LC	succulent;	Indigenous; Endemic
Bergeranthus multiceps	DD	succulent;	Indigenous; Endemic
Bergeranthus sp.		succulent;	
Berkheya carduoides	LC	herb;	Indigenous; Endemic
Berzelia commutata	LC	shrub;	Indigenous; Endemic
Blepharis sinuata	LC	herb; dwarf shrub;	Indigenous; Endemic
Boscia oleoides	LC	tree;	Indigenous; Endemic
Brachiaria arrecta	LC	graminoid;	Indigenous
Brachiaria serrata	LC	graminoid;	Indigenous
Brachylaena elliptica	LC	shrub; tree;	Indigenous; Endemic
Brachylaena glabra	LC	shrub; tree;	Indigenous; Endemic
Brunsvigia grandiflora	LC	geophyte;	Indigenous
Brunsvigia striata	LC	geophyte;	Indigenous; Endemic
Buchnera dura	LC	parasite; herb;	Indigenous
Buddleja saligna	LC	shrub; tree;	Indigenous
Bulbine abyssinica	LC	succulent; geophyte; herb;	Indigenous
Bulbine frutescens	LC	succulent; dwarf shrub;	Indigenous
Bulbine narcissifolia	LC	succulent; geophyte; herb;	Indigenous
Calodendrum capense	LC	tree;	Indigenous
Capeochloa arundinacea	LC		Indigenous
Capparis sepiaria	LC	shrub; scrambler; climber;	Indigenous
Caputia pyramidata	LC	succulent; dwarf shrub; shrub;	Indigenous; Endemic
Carpobrotus deliciosus	LC	succulent;	Indigenous; Endemic
Cenchrus ciliaris	LC	graminoid;	Indigenous
Centella affinis	LC	herb;	Indigenous; Endemic
Centella asiatica	LC	climber; herb;	Indigenous

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Centella virgata	LC	suffrutex; herb;	Indigenous; Endemic
Ceropegia cancellata	LC	succulent; climber;	Indigenous; Endemic
Ceropegia zeyheri	LC	succulent; climber;	Indigenous; Endemic
Chaenostoma polyanthum	LC	herb;	Indigenous; Endemic
Chironia tetragona	LC	suffrutex; herb;	Indigenous; Endemic
Chlorophytum capense	LC	herb;	Indigenous; Endemic
Chrysocoma ciliata	LC	shrub;	Indigenous
Cineraria lobata	LC	suffrutex;	Indigenous
Clausena anisata	LC	shrub; tree;	Indigenous
Cliffortia arcuata	LC	shrub;	Indigenous; Endemic
Cliffortia drepanoides	LC	shrub;	Indigenous; Endemic
Cliffortia linearifolia	LC	shrub;	Indigenous
Cliffortia repens	LC	shrub;	Indigenous
Cliffortia serpyllifolia	LC	shrub;	Indigenous
Cliffortia strobilifera	LC	shrub;	Indigenous
Clutia dregeana	LC	shrub;	Indigenous; Endemic
Clutia laxa	LC	shrub;	Indigenous
Clutia polifolia	LC	shrub;	Indigenous; Endemic
Cotula nigellifolia	LC	hydrophyte; herb;	Indigenous; Endemic
Cotyledon velutina	LC	succulent; shrub;	Indigenous; Endemic
Cotyledon woodii	LC	succulent; shrub;	Indigenous; Endemic
Crassula capitella	LC	succulent; herb;	Indigenous
Crassula capitella	LC	succulent; herb;	Indigenous; Endemic
Crassula cordata	LC	succulent; herb;	Indigenous; Endemic
Crassula ericoides	LC	succulent; dwarf shrub;	Indigenous; Endemic
Crassula expansa	LC	succulent; herb;	Indigenous
Crassula lactea	LC	scrambler; succulent;	Indigenous; Endemic
Crassula mesembryanthoides	LC	succulent; dwarf shrub;	Indigenous; Endemic
Crassula muscosa	NE	succulent; herb;	Indigenous

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Crassula nudicaulis	LC	succulent; dwarf shrub;	Indigenous; Endemic
Crassula ovata	LC	succulent; shrub;	Indigenous; Endemic
Crassula pellucida	LC	scrambler; succulent; herb;	Indigenous; Endemic
Crassula pellucida	LC	scrambler; succulent; herb;	Indigenous
Crassula perforata	LC	scrambler; succulent; dwarf shrub;	Indigenous; Endemic
Crassula pubescens	LC	succulent; dwarf shrub;	Indigenous; Endemic
Crassula tetragona	LC	succulent; dwarf shrub;	Indigenous; Endemic
Crotalaria natalensis	LC	shrub;	Indigenous; Endemic
Croton rivularis	LC	shrub;	Indigenous; Endemic
Curio articulatus	LC	succulent; dwarf shrub;	Indigenous; Endemic
Cussonia spicata	LC	succulent; tree;	Indigenous
Cussonia thyrsiflora	LC	tree; succulent; shrub;	Indigenous; Endemic
Cymbopogon marginatus	LC	graminoid;	Indigenous
Cymbopogon nardus	LC	graminoid;	Indigenous
Cynanchum ellipticum	LC	climber;	Indigenous
Cynodon dactylon	LC	graminoid;	Indigenous
Cynodon incompletus	LC	graminoid;	Indigenous; Endemic
Cyperus fastigiatus	LC	helophyte; cyperoid; herb;	Indigenous
Cyperus marginatus	LC	helophyte; cyperoid; herb;	Indigenous
Cyperus pulcher	LC	mesophyte; cyperoid; helophyte; herb;	Indigenous; Endemic
Cyperus rotundus	LC	mesophyte; cyperoid; herb;	Indigenous
Cyrtanthus collinus	LC	geophyte;	Indigenous; Endemic
Cyrtanthus helictus	DD	geophyte;	Indigenous; Endemic
Dalechampia capensis	LC	dwarf shrub;	Indigenous
Deinbollia oblongifolia	LC	shrub; tree;	Indigenous
Delosperma frutescens	LC	succulent; dwarf shrub;	Indigenous; Endemic
Delosperma prasinum	LC	succulent; dwarf shrub;	Indigenous; Endemic
Didymodon xanthocarpus		bryophyte;	Indigenous
Dierama pendulum	LC	geophyte; herb;	Indigenous; Endemic

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Diosma acmaeophylla	LC	dwarf shrub; shrub;	Indigenous; Endemic
Diospyros dichrophylla	LC	shrub; tree;	Indigenous
Diospyros scabrida			Indigenous
Dipogon lignosus	LC	climber; herb;	Indigenous
Doellia cafra	LC	herb;	Indigenous
Drimia anomala	LC	succulent; geophyte;	Indigenous; Endemic
Drimia intricata	LC	geophyte;	Indigenous
Drimia karooica	LC	succulent; geophyte;	Indigenous; Endemic
Drimia uniflora	LC	succulent; geophyte;	Indigenous
Drosanthemum ambiguum	LC	succulent;	Indigenous; Endemic
Drosanthemum breve	DD	succulent;	Indigenous; Endemic
Drosanthemum delicatulum	LC	succulent;	Indigenous; Endemic
Drosanthemum hispidum	LC	succulent;	Indigenous
Duvalia pillansii	LC	succulent;	Indigenous; Endemic
Dysphania ambrosioides			Not indigenous; Naturalised; Invasive
Ehrharta erecta	LC	graminoid;	Indigenous
Ehrharta ottonis	LC	geophyte; graminoid;	Indigenous; Endemic
Ehrharta villosa	LC	graminoid;	Indigenous; Endemic
Elegia vaginulata	LC	restioid; dwarf shrub;	Indigenous; Endemic
Elionurus muticus	LC	graminoid;	Indigenous
Elodea densa		hydrophyte;	Not indigenous; Cultivated; Naturalised; Invasive
Emex australis	LC	herb;	Indigenous
Enneapogon scoparius	LC	graminoid;	Indigenous
Eragrostis capensis	LC	graminoid;	Indigenous
Eragrostis curvula	LC	graminoid;	Indigenous
Eragrostis gummiflua	LC	graminoid;	Indigenous
Eragrostis obtusa	LC	graminoid;	Indigenous
Erica affinis	NT	shrub;	Indigenous; Endemic
Erica cerinthoides	NE	shrub;	Indigenous

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Erica chamissonis	LC	shrub;	Indigenous; Endemic
Erica demissa			Indigenous
Erica nutans	LC	shrub;	Indigenous; Endemic
Erica simulans	LC	shrub;	Indigenous; Endemic
Erica uberiflora	LC	shrub;	Indigenous; Endemic
Eriocephalus africanus	LC	shrub;	Indigenous; Endemic
Eriospermum dyeri	LC	geophyte;	Indigenous; Endemic
Eriospermum zeyheri	LC	geophyte;	Indigenous; Endemic
Erucastrum strigosum	LC	herb;	Indigenous
Euchaetis cristagalli	LC	dwarf shrub;	Indigenous; Endemic
Euclea daphnoides	LC	shrub; tree;	Indigenous
Eulophia streptopetala	LC	succulent; geophyte; herb;	Indigenous
Euphorbia albipollinifera	NT	succulent; dwarf shrub;	Indigenous; Endemic
Euphorbia esculenta	LC	succulent; shrub;	Indigenous; Endemic
Euphorbia jansenvillensis	VU	succulent; shrub;	Indigenous; Endemic
Euphorbia mauritanica	LC	succulent;	Indigenous
Euphorbia polygona	LC	succulent; shrub;	Indigenous; Endemic
Euphorbia procumbens	LC	succulent; dwarf shrub;	Indigenous; Endemic
Euphorbia radyeri	LC		Indigenous; Endemic
Euphorbia silenifolia	LC	succulent; dwarf shrub;	Indigenous; Endemic
Euphorbia tetragona	LC	succulent; tree;	Indigenous; Endemic
Exomis microphylla	LC	shrub;	Indigenous; Endemic
Falkia repens	LC	herb;	Indigenous; Endemic
Felicia amelloides	LC	herb; shrub;	Indigenous; Endemic
Felicia filifolia	LC	shrub;	Indigenous; Endemic
Felicia flanaganii	LC	shrub;	Indigenous; Endemic
Felicia ovata	LC	shrub;	Indigenous; Endemic
Ficinia gracilis	LC	mesophyte; cyperoid; herb;	Indigenous
Ficinia nigrescens	LC	mesophyte; cyperoid; herb;	Indigenous

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Ficinia tristachya	LC	mesophyte; cyperoid; herb;	Indigenous; Endemic
Ficinia zeyheri	LC	mesophyte; cyperoid; herb;	Indigenous; Endemic
Ficus ingens			Indigenous
Flueggea virosa	LC	shrub; tree;	Indigenous
Freesia corymbosa	LC	geophyte; herb;	Indigenous; Endemic
Fuirena ecklonii	LC	cyperoid; helophyte; herb;	Indigenous; Endemic
Fuirena hirsuta	LC	cyperoid; helophyte; herb;	Indigenous
Funaria rottleri		bryophyte;	Indigenous
Galenia pallens	DD	dwarf shrub;	Indigenous; Endemic
Galenia pubescens	LC	dwarf shrub;	Indigenous; Endemic
Galenia secunda	LC	dwarf shrub;	Indigenous
Gasteria bicolor	LC	succulent; herb;	Indigenous; Endemic
Gasteria nitida	LC	succulent; herb;	Indigenous; Endemic
Gerbera ambigua	LC	herb;	Indigenous
Gerbera piloselloides	LC	herb;	Indigenous
Gisekia pharnaceoides	LC	herb;	Indigenous
Gladiolus antholyzoides	LC	geophyte; herb;	Indigenous; Endemic
Gladiolus leptosiphon	VU	geophyte; herb;	Indigenous; Endemic
Gladiolus mortonius	LC	geophyte; herb;	Indigenous; Endemic
Glottiphyllum longum	LC	succulent;	Indigenous; Endemic
Gymnosporia heterophylla	LC	shrub; dwarf shrub;	Indigenous
Haemanthus albiflos	LC	succulent; geophyte;	Indigenous; Endemic
Halleria lucida	LC	shrub; tree;	Indigenous
Harveya hyobanchoides	LC	parasite; herb;	Indigenous; Endemic
Haworthia angustifolia	NE	succulent;	Indigenous; Endemic
Haworthia arachnoidea	NE	succulent;	Indigenous; Endemic
Haworthia arachnoidea	NE	succulent;	Indigenous; Endemic
Haworthia arachnoidea	NE	succulent;	Indigenous; Endemic
Haworthia cooperi	NE	succulent;	Indigenous; Endemic

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Haworthia cymbiformis	NE	succulent;	Indigenous; Endemic
Haworthia decipiens	NE	succulent;	Indigenous; Endemic
Haworthia decipiens	NE	succulent;	Indigenous; Endemic
Haworthia decipiens	NE	succulent;	Indigenous; Endemic
Haworthia herbacea	NE	succulent;	Indigenous; Endemic
Haworthiopsis glauca		succulent;	Indigenous; Endemic
Haworthiopsis glauca		succulent;	Indigenous; Endemic
Haworthiopsis nigra		succulent;	Indigenous; Endemic
Haworthiopsis reinwardtii		succulent;	Indigenous; Endemic
Haworthiopsis sordida		succulent;	Indigenous; Endemic
Haworthiopsis viscosa		succulent;	Indigenous; Endemic
Haworthiopsis woolleyi		succulent;	Indigenous; Endemic
Hedwigidium integrifolium		bryophyte;	Indigenous
Helichrysum asperum	LC	dwarf shrub;	Indigenous; Endemic
Helichrysum cymosum	LC	herb; shrub;	Indigenous; Endemic
Helichrysum gymnocomum	LC	herb;	Indigenous
Helichrysum miconiifolium	LC	herb;	Indigenous
Helichrysum nudifolium	LC	herb;	Indigenous
Heliophila subulata	LC	herb; dwarf shrub;	Indigenous; Endemic
Hemarthria altissima	LC	graminoid;	Indigenous
Hereroa granulata	LC	succulent;	Indigenous; Endemic
Hermannia althaeoides	LC	dwarf shrub;	Indigenous; Endemic
Hermannia conglomerata	LC	dwarf shrub;	Indigenous; Endemic
Hermannia cuneifolia	LC	dwarf shrub;	Indigenous
Hermannia filifolia	NE	dwarf shrub;	Indigenous; Endemic
Hermannia flammea	LC	dwarf shrub;	Indigenous; Endemic
Hermannia geniculata	LC	dwarf shrub;	Indigenous
Hermannia gracilis	LC	dwarf shrub; shrub;	Indigenous; Endemic
Hermannia mucronulata	LC	dwarf shrub;	Indigenous; Endemic

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Hermannia odorata	LC	dwarf shrub; shrub;	Indigenous; Endemic
Hermannia velutina	LC	dwarf shrub; shrub;	Indigenous
Herniaria erckertii	LC	herb;	Indigenous
Hertia kraussii	LC	shrub;	Indigenous; Endemic
Heterolepis mitis	LC	suffrutex; herb;	Indigenous; Endemic
Hibiscus aethiopicus	LC	herb;	Indigenous
Homalium dentatum	LC	tree;	Indigenous
Homalium rufescens	LC	tree;	Indigenous; Endemic
Hyperacanthus amoenus	LC	shrub;	Indigenous
Hypericum aethiopicum	LC	herb;	Indigenous
Hypericum lalandii	LC	herb;	Indigenous
Hypodiscus striatus	LC	restioid; dwarf shrub;	Indigenous; Endemic
Hypoxis longifolia	LC	geophyte;	Indigenous; Endemic
Hypoxis zeyheri	LC	geophyte;	Indigenous; Endemic
Ilex mitis			Indigenous
Indigofera denudata	LC	shrub;	Indigenous; Endemic
Indigofera disticha	LC	climber; herb;	Indigenous; Endemic
Indigofera grisophylla	LC	dwarf shrub;	Indigenous; Endemic
Indigofera sessilifolia	LC	herb; dwarf shrub;	Indigenous
Inulanthera dregeana	LC	shrub;	Indigenous; Endemic
Isolepis cernua	LC	helophyte; cyperoid; herb;	Indigenous
Isolepis sororia	LC	helophyte; cyperoid; herb;	Indigenous; Endemic
Jamesbrittenia argentea	LC	shrub;	Indigenous; Endemic
Jamesbrittenia foliolosa	LC	dwarf shrub;	Indigenous; Endemic
Jamesbrittenia tenuifolia	LC	dwarf shrub;	Indigenous; Endemic
Jamesbrittenia tortuosa	LC	dwarf shrub;	Indigenous; Endemic
Jamesbrittenia zuurbergensis	LC	dwarf shrub;	Indigenous; Endemic
Juncus lomatophyllus	LC	hyperhydate; hydrophyte; herb;	Indigenous
Justicia capensis	LC	scrambler; herb; shrub;	Indigenous

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Justicia orchioides	LC	dwarf shrub; shrub;	Indigenous; Endemic
Kalanchoe rotundifolia	LC	succulent; dwarf shrub;	Indigenous
Kedrostis nana	LC	succulent; climber; herb;	Indigenous; Endemic
Kiggelaria africana	LC	shrub; tree;	Indigenous
Kohautia amatymbica	LC	herb;	Indigenous
Lantana camara		shrub;	Not indigenous; Cultivated; Naturalised; Invasive
Lasiosiphon anthylloides	LC		Indigenous; Endemic
Lasiospermum bipinnatum	LC	herb;	Indigenous
Lauridia reticulata	LC	scrambler; shrub;	Indigenous; Endemic
Lebeckia pauciflora	LC	herb;	Indigenous; Endemic
Ledebouria nitida			Indigenous; Endemic
Leonotis pentadentata	LC		Indigenous
Leptochloa fusca	LC	graminoid;	Indigenous
Leucadendron eucalyptifolium	LC	shrub;	Indigenous; Endemic
Leucadendron salignum	LC	shrub;	Indigenous; Endemic
Leucospermum cuneiforme	LC	shrub;	Indigenous; Endemic
Lichtensteinia interrupta	LC	herb;	Indigenous; Endemic
Limonium linifolium	NE	shrub; dwarf shrub;	Indigenous; Endemic
Linum thunbergii	LC	herb;	Indigenous
Lobelia anceps	LC	herb;	Indigenous
Lobelia linearis	LC	herb; dwarf shrub;	Indigenous; Endemic
Lobelia thermalis	LC	herb;	Indigenous
Lobelia tomentosa	LC	herb; dwarf shrub;	Indigenous; Endemic
Lobostemon fruticosus	LC	shrub;	Indigenous; Endemic
Lobostemon trigonus	LC	shrub;	Indigenous; Endemic
Loxostylis alata	LC	shrub; tree;	Indigenous; Endemic
Lycium cinereum	LC	dwarf shrub; shrub;	Indigenous
Lycium ferocissimum	LC	dwarf shrub; shrub;	Indigenous
Lycium oxycarpum	LC	tree; shrub;	Indigenous; Endemic

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Lycium pumilum	LC	shrub;	Indigenous
Lysimachia huttonii		herb;	Indigenous
Macledium spinosum	LC	dwarf shrub;	Indigenous; Endemic
Maerua cafra	LC	shrub; tree;	Indigenous
Marsdenia dregea			Indigenous
Marsilea capensis	LC	hydrophyte; herb;	Indigenous
Maytenus acuminata	LC	shrub; tree;	Indigenous
Maytenus undata	LC	shrub; tree;	Indigenous
Melinis nerviglumis	LC	graminoid;	Indigenous
Melinis repens	LC	graminoid;	Indigenous
Mesembryanthemum articulatum		succulent;	Indigenous
Mesembryanthemum barklyi	LC	succulent;	Indigenous
Mesembryanthemum coriarium		succulent;	Indigenous
Mesembryanthemum haeckelianum		succulent;	Indigenous; Endemic
Mesembryanthemum junceum		succulent;	Indigenous; Endemic
Mesembryanthemum splendens		succulent;	Indigenous; Endemic
Mesembryanthemum splendens		succulent;	Indigenous; Endemic
Mestoklema arboriforme	LC	succulent;	Indigenous; Endemic
Metalasia massonii	LC	shrub;	Indigenous; Endemic
Metalasia trivialis	LC	shrub;	Indigenous; Endemic
Microchloa caffra	LC	graminoid;	Indigenous
Microglossa mespilifolia	LC	shrub;	Indigenous; Endemic
Miscanthus ecklonii	LC	graminoid;	Indigenous
Monopsis alba	LC	herb;	Indigenous; Endemic
Moraea simulans	LC	geophyte; herb;	Indigenous
Muraltia ericaefolia	LC	shrub; dwarf shrub;	Indigenous; Endemic
Muraltia squarrosa	LC	shrub;	Indigenous; Endemic
Nerine undulata	LC	geophyte;	Indigenous; Endemic
Nidorella undulata	LC	herb;	Indigenous

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Noltea africana	LC	shrub; tree;	Indigenous; Endemic
Notobubon laevigatum	LC	shrub;	Indigenous
Notobubon sonderi	LC	shrub;	Indigenous; Endemic
Nuxia floribunda	LC	shrub; tree;	Indigenous
Nymania capensis	LC	tree; shrub;	Indigenous
Nymphoides thunbergiana	LC	hydrophyte;	Indigenous
Oenothera stricta		herb;	Not indigenous; Naturalised; Invasive
Oldenburgia grandis	LC	shrub; tree;	Indigenous; Endemic
Olinia ventosa	LC	shrub; tree;	Indigenous; Endemic
Ornithogalum juncifolium	NE	succulent; geophyte;	Indigenous
Osteospermum calendulaceum	LC	herb;	Indigenous; Endemic
Osteospermum herbaceum	LC	herb;	Indigenous; Endemic
Osteospermum junceum	LC	suffrutex;	Indigenous; Endemic
Osteospermum pterigoideum	EN	suffrutex;	Indigenous; Endemic
Otholobium sericeum	LC	dwarf shrub; shrub;	Indigenous; Endemic
Othonna triplinervia	LC	succulent; shrub;	Indigenous; Endemic
Pachypodium bispinosum	LC	succulent; dwarf shrub;	Indigenous; Endemic
Pachypodium succulentum	LC	succulent; shrub;	Indigenous; Endemic
Panicum deustum	LC	graminoid;	Indigenous
Panicum ecklonii	LC	graminoid;	Indigenous
Panicum gilvum	LC	graminoid;	Indigenous
Panicum maximum	LC	graminoid;	Indigenous
Panicum stapfianum	LC	graminoid;	Indigenous
Papillaria africana		bryophyte; epiphyte;	Indigenous
Paspalum distichum	LC	graminoid;	Not indigenous; Naturalised; Invasive
Passerina falcifolia	LC	tree; shrub;	Indigenous; Endemic
Passerina obtusifolia	LC	dwarf shrub; shrub;	Indigenous; Endemic
Passerina quadrifaria	LC	shrub;	Indigenous; Endemic
Pauridia flaccida	LC	geophyte;	Indigenous; Endemic

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Pavetta capensis	LC	shrub;	Indigenous; Endemic
Pavonia praemorsa	LC	shrub;	Indigenous; Endemic
Pelargonium odoratissimum	LC	dwarf shrub;	Indigenous
Pelargonium panduriforme	LC	shrub;	Indigenous; Endemic
Pelargonium pulverulentum	LC	succulent; geophyte;	Indigenous; Endemic
Pelargonium sidoides	LC	geophyte; dwarf shrub;	Indigenous
Pelargonium worcesterae	LC	succulent; dwarf shrub;	Indigenous; Endemic
Pennisetum macrourum	LC	graminoid;	Indigenous
Pennisetum setaceum	NE	graminoid;	Not indigenous; Naturalised; Invasive
Pentameris curvifolia	LC		Indigenous
Pentameris glandulosa	LC		Indigenous
Pentameris pallida	LC		Indigenous
Pentzia incana	LC	shrub;	Indigenous
Pharnaceum dichotomum	LC	dwarf shrub; herb;	Indigenous
Phylica axillaris	NE	dwarf shrub; shrub;	Indigenous; Endemic
Phylica debilis		dwarf shrub;	Indigenous
Phylica paniculata	LC	tree; shrub;	Indigenous
Phylica willdenowiana	LC	shrub;	Indigenous; Endemic
Phymaspermum parvifolium	LC	dwarf shrub;	Indigenous; Endemic
Physalis angulata		herb;	Not indigenous; Naturalised; Invasive
Piaranthus geminatus	LC	succulent;	Indigenous; Endemic
Plectranthus spicatus	LC	succulent; herb;	Indigenous
Poa binata	LC	graminoid;	Indigenous
Polygala asbestina	LC	herb; dwarf shrub;	Indigenous; Endemic
Polygala illepida	LC	herb;	Indigenous; Endemic
Polygala microlopha	LC	dwarf shrub;	Indigenous; Endemic
Polygala myrtifolia	LC	shrub;	Indigenous
Polygala pungens	LC	herb; dwarf shrub;	Indigenous; Endemic
Polygonum aviculare		herb;	Not indigenous; Naturalised

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Polypogon monspeliensis	NE	graminoid;	Not indigenous; Naturalised
Polypogon viridis	NE	graminoid;	Not indigenous; Naturalised
Porotrichum madagassum		bryophyte; epiphyte;	Indigenous
Printzia polifolia	LC	shrub;	Indigenous; Endemic
Protea eximia	LC	tree; shrub;	Indigenous; Endemic
Protea repens	LC	shrub; tree;	Indigenous; Endemic
Protea tenax	LC	dwarf shrub;	Indigenous; Endemic
Protorhus longifolia	LC	tree;	Indigenous
Pseudoselago violacea	LC	herb;	Indigenous; Endemic
Psoralea monophylla	LC	dwarf shrub;	Indigenous; Endemic
Psoralea oligophylla	LC	shrub;	Indigenous; Endemic
Ptaeroxylon obliquum	LC	tree;	Indigenous
Pterocelastrus tricuspidatus	LC	shrub; tree;	Indigenous; Endemic
Pteronia incana	LC	shrub;	Indigenous; Endemic
Pteronia teretifolia	LC	shrub;	Indigenous; Endemic
Pulicaria scabra	LC	herb;	Indigenous
Putterlickia pyracantha	LC	shrub;	Indigenous; Endemic
Pycreus polystachyos	LC	mesophyte; cyperoid; helophyte; herb;	Indigenous
Raphionacme zeyheri	LC	succulent; geophyte; herb;	Indigenous; Endemic
Restio gaudichaudianus	LC		Indigenous; Endemic
Restio vimineus	LC		Indigenous; Endemic
Rhigozum obovatum	LC	shrub; tree;	Indigenous
Rhodocoma capensis	LC	restioid; dwarf shrub; shrub;	Indigenous; Endemic
Rhoicissus tridentata	NE	shrub;	Indigenous; Endemic
Rhynchosia caribaea	LC	climber; herb;	Indigenous
Roepera foetida		succulent; shrub;	Indigenous
Roepera lichtensteiniana		succulent; dwarf shrub; shrub;	Indigenous
Romulea autumnalis	LC	geophyte; herb;	Indigenous; Endemic
Rubus rigidus	LC	shrub;	Indigenous

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Salvia aurita	LC	herb;	Indigenous; Endemic
Schismus barbatus	LC	graminoid;	Indigenous
Schizaea pectinata	LC	lithophyte; geophyte; herb;	Indigenous
Schizoglossum aschersonianum	DD	succulent; herb;	Indigenous; Endemic
Schkuhria pinnata		herb;	Not indigenous; Naturalised
Schotia afra	LC	shrub; tree;	Indigenous
Schotia latifolia	LC	tree;	Indigenous
Searsia glauca	LC	tree; shrub;	Indigenous; Endemic
Searsia incisa	LC	tree; shrub;	Indigenous; Endemic
Searsia incisa	LC	shrub;	Indigenous; Endemic
Searsia longispina	LC	tree; shrub;	Indigenous; Endemic
Searsia magalismontana	LC	dwarf shrub; shrub;	Indigenous
Searsia pentheri	LC	shrub; tree;	Indigenous
Searsia pyroides	LC	shrub; tree;	Indigenous
Selago glomerata	LC	shrub; dwarf shrub;	Indigenous; Endemic
Senecio albanensis	LC	herb;	Indigenous
Senecio angustifolius	LC	herb; dwarf shrub;	Indigenous
Senecio inaequidens	LC	herb;	Indigenous
Senecio junceus	LC	succulent; herb; shrub;	Indigenous; Endemic
Senecio linifolius	LC	succulent; shrub;	Indigenous
Senecio pinifolius	LC	dwarf shrub;	Indigenous; Endemic
Senna floribunda	NE		Not indigenous; Cultivated; Naturalised
Setaria sphacelata	LC	graminoid;	Indigenous
Setaria verticillata	LC	graminoid;	Indigenous
Sisymbrium capense	LC	herb;	Indigenous
Sonchus asper		herb;	Not indigenous; Naturalised; Invasive
Sonchus dregeanus	LC	herb;	Indigenous
Sporobolus ioclados	LC	graminoid;	Indigenous
Stapelia grandiflora		succulent;	Indigenous

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Stapelia grandiflora	LC	succulent;	Indigenous
Stapelia grandiflora	LC	succulent;	Indigenous; Endemic
Stapelia paniculata		succulent;	Indigenous
Stenotaphrum secundatum	LC	graminoid;	Indigenous
Stipa dregeana	LC	graminoid;	Indigenous; Endemic
Strelitzia juncea	VU	herb;	Indigenous; Endemic
Struthiola parviflora	LC	dwarf shrub; shrub;	Indigenous; Endemic
Strychnos decussata	LC	shrub; tree;	Indigenous
Symphyotrichum squamatum			Not indigenous; Naturalised
Syncarpha milleflora	LC	shrub;	Indigenous; Endemic
Tenaxia disticha			Indigenous
Tephrosia capensis	LC	herb; dwarf shrub; shrub;	Indigenous
Tetraria bromoides	LC	helophyte; mesophyte; cyperoid; herb;	Indigenous; Endemic
Tetraria pubescens	LC	mesophyte; cyperoid; herb;	Indigenous; Endemic
Teucrium africanum	LC	dwarf shrub;	Indigenous; Endemic
Teucrium trifidum	LC	herb;	Indigenous
Thamniopsis utacamundiana			Indigenous
Thesium hystrix	LC	dwarf shrub; parasite; shrub;	Indigenous
Thesium junceum	LC	shrub; parasite; herb;	Indigenous; Endemic
Thesium nigromontanum	LC	herb; parasite; shrub;	Indigenous; Endemic
Thesium squarrosum	LC	shrub; parasite; herb;	Indigenous
Thesium turczaninowii		parasite; shrub;	Indigenous; Endemic
Todea barbara	LC	geophyte; herb;	Indigenous
Tragus berteronianus	LC	graminoid;	Indigenous
Tragus koelerioides	LC	graminoid;	Indigenous
Tribolium curvum	LC		Indigenous
Tribolium obtusifolium	LC	graminoid;	Indigenous; Endemic
Trichodiadema aureum	VU	succulent;	Indigenous; Endemic
Trichodiadema intonsum	LC	succulent;	Indigenous; Endemic

SPECIES	IUCN	DIAGNOSTIC	ECOLOGY
Trieenea glutinosa	LC	suffrutex; herb;	Indigenous; Endemic
Triquetrella tristicha		bryophyte;	Indigenous
Trisetopsis imberbis		graminoid;	Indigenous
Tritonia dubia	NT	geophyte; herb;	Indigenous; Endemic
Tritonia securigera	LC		Indigenous; Endemic
Tritoniopsis caffra	LC	geophyte; herb;	Indigenous; Endemic
Viscum continuum	LC	succulent; parasite; shrub;	Indigenous; Endemic
Vulpia myuros	NE	graminoid;	Not indigenous; Naturalised; Invasive
Wahlenbergia capillacea	LC	herb;	Indigenous
Wahlenbergia cinerea	LC	dwarf shrub;	Indigenous; Endemic
Wahlenbergia madagascariensis	LC	herb;	Indigenous
Wahlenbergia undulata	LC	herb;	Indigenous
Zaluzianskya peduncularis	LC	herb;	Indigenous
Zehneria scabra		climber; herb;	Indigenous

APPENDIX C: Floral SCC Assessment Results

South Africa uses the internationally endorsed IUCN Red List Categories and Criteria in the Red List of South African plants. This scientific system is designed to measure species' risk of extinction. The purpose of this system is to highlight those species that are most urgently in need of conservation action. Due to its strong focus on determining risk of extinction, the IUCN system does not highlight species that are at low risk of extinction but may nonetheless be of high conservation importance. Because the Red List of South African plants is used widely in South African conservation practices such as systematic conservation planning or protected area expansion, we use an amended system of categories designed to highlight those species that are at low risk of extinction but of conservation concern.

Definitions of the national Red List categories

Categories marked with ^{N} are non-IUCN, national Red List categories for species not in danger of extinction but considered of conservation concern. The IUCN equivalent of these categories is Least Concern (LC).

- **Extinct (EX)** A species is Extinct when there is no reasonable doubt that the last individual has died. Species should be classified as Extinct only once exhaustive surveys throughout the species' known range have failed to record an individual.
- **Extinct in the Wild (EW)** A species is Extinct in the Wild when it is known to survive only in cultivation or as a naturalized population (or populations) well outside the past range.
- **Regionally Extinct (RE)** A species is Regionally Extinct when it is extinct within the region assessed (in this case South Africa), but wild populations can still be found in areas outside the region.
- **Critically Endangered, Possibly Extinct (CR PE)** Possibly Extinct is a special tag associated with the category Critically Endangered, indicating species that are highly likely to be extinct, but the exhaustive surveys required for classifying the species as Extinct has not yet been completed. A small chance remains that such species may still be rediscovered.
- **Critically Endangered (CR)** A species is Critically Endangered when the best available evidence indicates that it meets at least one of the five IUCN criteria for Critically Endangered, indicating that the species is facing an extremely high risk of extinction.
- **Endangered (EN)** A species is Endangered when the best available evidence indicates that it meets at least one of the five IUCN criteria for Endangered, indicating that the species is facing a very high risk of extinction.
- **Vulnerable (VU)** A species is Vulnerable when the best available evidence indicates that it meets at least one of the five IUCN criteria for Vulnerable, indicating that the species is facing a high risk of extinction.
- **Near Threatened (NT)** A species is Near Threatened when available evidence indicates that it nearly meets any of the IUCN criteria for Vulnerable and is therefore likely to become at risk of extinction in the near future.
- ^{N}**Critically Rare** A species is Critically Rare when it is known to occur at a single site but is not exposed to any direct or plausible potential threat and does not otherwise qualify for a category of threat according to one of the five IUCN criteria.
- ^{N}**Rare** A species is Rare when it meets at least one of four South African criteria for rarity but is not exposed to any direct or plausible potential threat and does not qualify for a category of threat according to one of the five IUCN criteria. The four criteria are as follows:
  - Restricted range: Extent of Occurrence (EOO) <500 km^2, OR
  - Habitat specialist: Species is restricted to a specialized microhabitat so that it has a very small Area of Occupancy (AOO), typically smaller than 20 km^2, OR
  - Low densities of individuals: Species always occurs as single individuals or very small subpopulations (typically fewer than 50 mature individuals) scattered over a wide area, OR
  - Small global population: Less than 10 000 mature individuals.
- **Least Concern** A species is Least Concern when it has been evaluated against the IUCN criteria and does not qualify for any of the above categories. Species classified as Least Concern are considered at low risk of extinction. Widespread and abundant species are typically classified in this category.
- **Data Deficient - Insufficient Information (DDD)** A species is DDD when there is inadequate information to make an assessment of its risk of extinction, but the species is well defined. Listing of species in this category indicates that more information is required, and that future research could show that a threatened classification is appropriate.

- **Data Deficient - Taxonomically Problematic (DDT)** A species is DDT when taxonomic problems hinder the distribution range and habitat from being well defined, so that an assessment of risk of extinction is not possible.
- **Not Evaluated (NE)** A species is Not Evaluated when it has not been evaluated against the criteria. The national Red List of South African plants is a comprehensive assessment of all South African indigenous plants, and therefore all species are assessed and given a national Red List status. However, some species included in **Plants of southern Africa: an online checklist** are species that do not qualify for national listing because they are naturalized exotics, hybrids (natural or cultivated), or synonyms. These species are given the status Not Evaluated and the reasons why they have not been assessed are included in the assessment justification.

POC Results for RDL Floral SCC obtained from BODATSA and the Online National Environmental Screening Tool

For this aspect of the POC assessment, a list of RDL species previously recorded within the QDS 3324BD, 3325AC, 3325 AD, 3325CB, 3325 DA were pulled from BODATSA / newPOSA (http://posa.sanbi.org/) – refer to the below image (Figure C1). This list was further cross-checked with the Screening Tool outcome as well as the NCNCA (2009) flora list (Schedule 1 and Schedule 2) to identify provincially protected species previously recorded for the area.

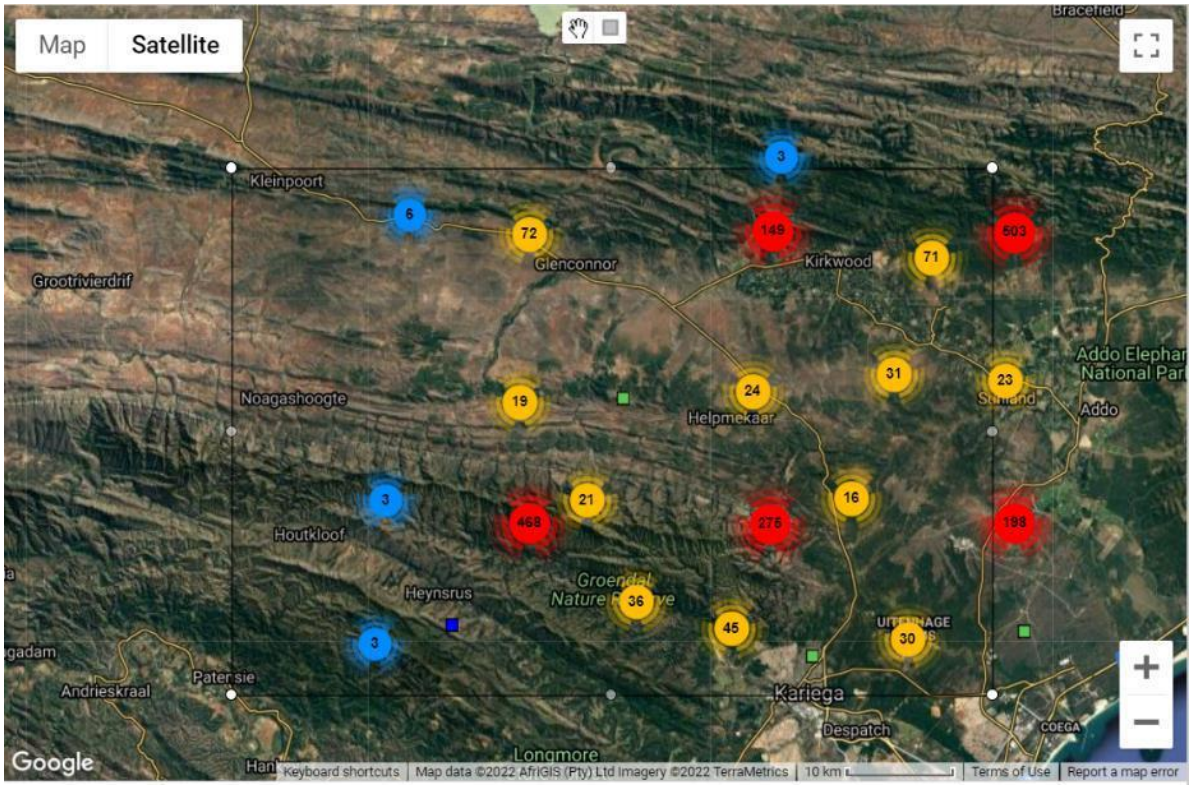


Figure C1: Species list pulled from BODATSA and newPOSA for the QDS 3325BD, 3325AC, 3325AD, 3325CB and 3325DA.

Table C1: POC assessment results for threatened species as identified for the assessed area by the Screening Tool, the BODATSA/newPOSA database.

Family	Species	POC Score	Habitat and distribution details	IUCN & Protection Status
Fabaceae	*Argyrolobium barbatum*	Medium	**Range**: Paterson and Addo to Port Elizabeth. **Major habitats**: Sundays Valley Thicket, Nanaga Savanna Thicket. **Description**: Bushveld, limestone outcrops. **Suitable habitat on site** within the Sundays Valley Thicket Sub-Unit (located within the middle section of the proposed OHPL) on exposed rocky surfaces.	**VU**
Aizoaceae	*Rhombophyllum rhomboideum*	Medium	**Range**: Uitenhage and Port Elizabeth. **Major habitats**: Sundays Valley Thicket, Motherwell Karroid Thicket, Grass Ridge Bontveld. **Description**: Sundays Thicket associated with calcrete soils. **Suitable habitat on site**: located within the Sundays Valley Thicket Sub-Unit (distributed within the middle section of the proposed OHPL) can be found on exposed rocky ridges composed of calcrete.	**EN**
Amaryllidaceae	*Apodolirion macowanii*	Medium	**Range**: Fish River to Jeffrey's Bay. **Major habitats**: Humansdorp Shale Renosterveld, Sundays Valley Thicket, Sundays Mesic Thicket, Grahamstown Grassland Thicket, Fish Arid Thicket, Bethelsdorp Bontveld, Albany Bontveld. **Description**: Heavy clay soils in renosterveld or valley bushveld. **Suitable habitat on site**: that is located within the middle section of the OHPL) surrounding various water catchment areas where the soils have a higher clay content	**VU**
Asparagaceae	*Asparagus spinescens*	Low	**Range**: Uitenhage to Queenstown. **Major habitats**: Albany Thicket, Grassland. **Description**: Mountain slopes and valleys.	**R**
Aizoaceae	*Corpuscularia lehmannii*	Medium	**Range**: Coega to Port Elizabeth. **Major habitats**: Algoa Sandstone Fynbos, Sundays Valley Thicket, Motherwell Karroid Thicket, Bethelsdorp Bontveld. **Description**: Quartzite outcrops. **Suitable habitat on site**: distributed within the middle portion of the OHPL, where sites consist of exposed quartzite rocky outcrops	**CR**
Crassulaceae	*Cotelydon tomentosa* subsp. *tomentosa*	Medium	**Range**: Ladismith to Steytlerville. **Major habitats**: Koedoesberge-Moordenaars Karoo, Sundays Arid Thicket, Oudshoorn Karroid Thicket. **Description**: Arid thicket, on lower, gravely slopes in sheltered ravines. **Suitable habitat on site**: found within the Scattered Bush Clumps Sub-Unit which is located on the upper Western portion and scattered throughout to the middle portion of the OHPL. Can be located on sheltered slopes and ravines that create a suitable microclimate for this species.	**LC**
Apocynaceae	*Duvalia pillansii*	Low	**Range**: Hankey and Kirkwood. **Major habitats**: Albany Thicket. **Description**: Stony ground in thicket vegetation.	**R**

Family	Species	POC Score	Habitat and distribution details	IUCN & Protection Status
Acanthaceae	*Justica orchioides* subsp. *orchioides*	Low	**Range**: St Francis Bay to Addo. **Major habitats**: Albany Alluvial Vegetation, Sundays Valley Thicket, Grass Ridge Bontveld, Sundays Mesic Thicket, Motherwell Karroid Thicket, Bethelsdorp Bontveld. **Description**: Open sandy areas, often in lime-rich soils.	**VU**
Marsileaceae	*Marsilea schelpeana*	Low	**Range**: Bredasdorp to Port Elizabeth. **Major habitats**: Mossel Bay Shale Renosterveld, Tsitsikamma Sandstone Fynbos, Albany Alluvial Vegetation, Sundays Valley Thicket, Bethelsdorp Bontveld. **Description**: Margins of seasonal pools and along water courses from near sea level to about 200 m.	**VU**
Myrsinaceae	*Rapanea gilliana*	Low	**Range**: St. Francis Bay to Port Alfred. **Major habitats**: Algoa Sandstone Fynbos, St Francis Dune Thicket, Hamburg Dune Thicket, Sundays Mesic Thicket, Kasouga Dune Thicket, Grass Ridge Bontveld. **Description**: Coastal sand dunes.	**VU**
Lamiaceae	*Salvia obtusata*	Low	**Range**: Port Elizabeth to Addo. **Major habitats**: Sundays Valley Thicket. **Description**: Unknown. This species' habitat preferences are not described in the literature (Codd 1985), nor are there any habitat notes on the few specimens of this species.	**VU**
Scrophulariaceae	*Selago zeyheri*	Medium	**Range**: Port Elizabeth to the Suurberge. **Major habitats**: Albany Alluvial Vegetation, Koedoeskloof Karroid Thicket, Grass Ridge Bontveld. **Description**: Dry stony flats and lower slopes in grassy vegetation. **Suitable habitat on site**: within the Thicket Patches Sub-Unit located on the lower Eastern portion of the OHPL. Possible to occur within the grassy vegetation separating the Thicket Patches.	**VU**
Strelitziaceae	*Strelitzia juncea*	High	**Range**: Port Elizabeth, Uitenhage and Patensie. **Major habitats**: Sundays Valley Thicket. **Description**: Succulent thicket. **Suitable habitat on site**: located within the middle portion of the OHPL where the dense thicket vegetation can provide the necessary niche conditions and altered micro climatic conditions for this species to occur.	**VU**
Asteraceae	*Syncarpha recurvata*	Medium	**Range**: Port Elizabeth, Uitenhage and Addo. **Major habitats**: South Eastern Coastal Thornveld, Albany Alluvial Vegetation, Sundays Valley Thicket, Grass Ridge Bontveld. **Description**: Calcrete pavements. **Suitable habitat on site**: distributed within the middle portion of the OHPL, where rocky outcrops are exposed and composed of calcite	**EN**
Aizoaceae	*Trichodiadema aureum*	Low	**Range**: Willowmore to Jeffrey's Bay. **Major habitats**: Steytlerville Karoo, Southern Karoo Riviere, Albany Alluvial Vegetation, Sundays Valley Thicket. **Description**: Karroid vegetation, near alluvial soils.	**VU**
Zygophyllaceae	*Zygophyllum divaricatum*	Medium	**Range**: Sundays River to Coega and Addo. **Major habitats**: Grass Ridge Bontveld. Coega Bontveld. **Description**: Coega Bontveld.	**EN**

Family	Species	POC Score	Habitat and distribution details	IUCN & Protection Status
			Suitable habitat on site: within the Thicket Patches Sub-Unit located on the lower Eastern portion of the OHPL. Possible to occur within outcrops of limestone surfaces within the dwarf grasslands distributed between Thicket Patches	
Asphodelaceae	*Sensitive Species 19*	Low	**Range**: Patensie to the Mbashe River. **Major habitats**: Bushveld, Sundays Valley Thicket, Motherwell Karroid Thicket, Fish Valley Thicket, Doubledrift Karroid Thicket, Buffels Mesic Thicket, Albany Valley Thicket. **Description**: Karroid scrub, clearings in valley bushveld and steep cliffs.	**VU**
Asphodelaceae	*Sensitive Species 1101*	Low	**Range**: Sundays and Gamtoos River Valleys. **Major habitats**: Albany Alluvial Vegetation, Sundays Valley Thicket. **Description**: Valley bottoms and lower slopes of hills in rocky, loamy soils.	**EN**
Euphorbiaceae	*Sensitive Species 1235*	Low	**Range**: Port Elizabeth to Uitenhage. **Major habitats**: Albany Alluvial Vegetation, Sundays Valley Thicket, Motherwell Karroid Thicket. **Description**: Low, stony hills not further than 20 km from the coast, in full sun.	**EN**
Crassulaceae	*Sensitive Species 234*	Low	**Range**: Klein Winterhoek Mountains near Kleinpoort. **Major habitats**: Albany Thicket. **Description**: Lower rocky slopes in sheltered ravines.	**CR**
Hyacinthaceae	*Sensitive Species 1248*	Low	**Range**: . **Major habitats**: Moist Grassland, Fish Valley Thicket, Sundays Valley Thicket, Pondoland-Ugu Sandstone Coastal Sourveld, Southern Afrotemperate Forest, Northern Afrotemperate Forest, Southern Mistbelt Forest, Northern Mistbelt Forest, Scarp Forest, Amathole Montane Grassland, Carletonville Dolomite Grassland, Zastron Moist Grassland, Egoli Granite Grassland, Baviaans Valley Thicket, Tsakane Clay Grassland, Eastern Valley Bushveld, East Griqualand Grassland, Queenstown Thornveld, KwaZulu-Natal Highland Thornveld, Midlands Mistbelt Grassland, Gauteng Shale Mountain Bushveld, Andesite Mountain Bushveld, Loskop Mountain Bushveld, Soutpansberg Mountain Bushveld, Mamabolo Mountain Bushveld, Marikana Thornveld, Gold Reef Mountain Bushveld, Malelane Mountain Bushveld, Soutpansberg Summit Sourveld. **Description**: Low and medium altitudes, usually along mountain ranges and in thickly vegetated river valleys, often under bush clumps and in boulder screes, sometimes found scrambling at the margins of karroid, succulent bush in the Eastern Cape. Tolerates wet and dry conditions, growing predominantly in summer rainfall areas with an annual rainfall of 200-800 mm.	**VU**
Zamiaceae	Sensitive Species 1268	Confirmed	**Major habitats**: Sundays Valley Thicket, Bethelsdorp Bontveld. **Description**: Xeric thicket, often on rocky quartzite outcrops. **Suitable habitat on site**: Located within the distribution of the OHPL however due to the	**EN**

Family	Species	POC Score	Habitat and distribution details	IUCN & Protection Status
			sensitivity of this species we can not disclose site specific information regarding the locality of this species.	
Hyacinthaceae	Sensitive Species 475	Low	**Range**: Port Elizabeth to Grahamstown. **Major habitats**: Sundays Valley Thicket, Saltaire Karroid Thicket, Nanaga Savanna Thicket. **Description**: Sandy soils at low altitude, 0-300 m	**VU**
Amaryllidaceae	Sensitive Species 570	Low	**Range**: Uitenhage to Port Elizabeth. **Major habitats**: Vegetation, Sundays Valley Thicket, Motherwell Karroid Thicket, Bethelsdorp Bontveld. **Description**: Flats and lower slopes in semi-arid areas.	**EN**
Asphodelaceae	Sensitive Species 779	Medium	**Range**: Uitenhage to Coega, and also near Kirkwood. **Major habitats**: Sundays Valley Thicket, Baviaans Valley Thicket. **Description**: Subtropical transition thicket, in rocky soils on level to southwest-facing slopes. **Suitable habitat on site**: distributed within the Sundays Valley Thicket Sub-Unit located on the middle portion of the OHPL. The geography wihtin this site is composed of various hills and valleys and therefore Southern facing slopes located on the Northern border of the OHPL could be ideal habitat for this species	**EN**
Asteraceae	Sensitive Species 91	Low	**Range**: Euryops ericifolius . **Major habitats**: Sundays Valley Thicket, Motherwell Karroid Thicket, Grass Ridge Bontveld. **Description**: Low altitude flats and slopes.	**EN**
Apocynaceae	Sensitive Species 997	Medium	**Range**: Kleinpoort and Coega Kop. **Major habitats**: Saltaire Karroid Thicket, Eastern Gwarrieveld. **Description**: Open, dry, rocky, grassy karoo, in shallow sandy soils on flats **Suitable habitat on site**: Potentially occurring within the Grassridge Bontveld Habitat Unit, within the Thicket Patches Sub-Unit on open exposed rocky surfaces.	**EN**
Dioscoreaceae	Sensitive Species 1252	Low	**Range**: Western Cape, Eastern Cape, KwaZulu-Natal, Free State, Gauteng, Mpumalanga, Limpopo Province, Swaziland, Zimbabwe and Zambia. **Major habitats**: Forest, Northern Escarpment Dolomite Grassland, Leolo Summit Sourveld, KaNgwane Montane Grassland, Wakkerstroom Montane Grassland, Rand Highveld Grassland, Northern Drakensberg Highland Grassland, Fish Valley Thicket, Scarp Forest, Long Tom Pass Montane Grassland, Southern Mistbelt Forest, Northern Afrotemperate Forest, Algoa Sandstone Fynbos, Pondoland-Ugu Sandstone Coastal Sourveld, Maputaland Coastal Belt, Albany Alluvial Vegetation, Sundays Mesic Thicket, Northern Coastal Forest, Soutpansberg Mountain Bushveld, KwaZulu-Natal Sandstone Sourveld, Thukela Thornveld, Tzaneen Sour Bushveld, Granite Lowveld, Western Maputaland Clay Bushveld, Malelane Mountain Bushveld, Pretoriuskop Sour Bushveld, Soutpansberg Summit Sourveld, Polokwane Plateau Bushveld, Steenkampsberg	**VU**

Family	Species	POC Score	Habitat and distribution details	IUCN & Protection Status
			Montane Grassland, Springbokvlakte Thornveld, Northern KwaZulu-Natal Moist Grassland, Ithala Quartzite Sourveld, Tsakane Clay Grassland, Soweto Highveld Grassland, Eastern Free State Sandy Grassland, Eastern Valley Bushveld, Sekhukhune Plains Bushveld. **Description**: Wooded and relatively mesic places, such as the moister bushveld areas, coastal bush and wooded mountain kloofs.	

****Threatened status and additional information on species habitat and distribution was obtained from The Red List of South African Plants (http://redlist.sanbi.org/index.php). The POC of these floral SCC within the Investigation Area is also provided.**

LC = Least Concern; **NE** = Not evaluated; **POC** = Probability of Occurrence **R** = Rare; VU = Vulnerable; **EN** = Endangered

NFA Protected Trees Species List for South Africa

Table C2: Protected trees as defined by The National Forest Act, 1998, (Act No. 84 of 1998) (NFA) for the assessed areas. Additional information on species threat status as defined in The Red List of South African Plants (http://redlist.sanbi.org/index.php) is presented.

NEMBA TOPS LIST (PLANT SPECIES)				
Scientific Name	**Common Name**	**POC**	**Provincial Distribution**	**Conservation Status**
Boscia albitrunca	White-stem Shepherds-tree	Medium	Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape, North West **Suitable habitat on site**: this species can occur within the Scattered Bush Clump and Thicket Patches Sub-Units located from the upper Western portions to the lower Eastern sections of the OHPL due to the aridity of this regions and cluster habitat that support various tree growth forms	**LC:P**
Encephalartos species	Cycad species	Confirmed	Endemic to South Africa, this cycad is restricted to the Port Elizabeth and Uitenhage districts of Eastern Cape **Suitable habitat on site:** located within the distribution of the OHPL however due to the sensitivity of this species we can not disclose site specific information regarding the locality of this species.	**CE:P**
Pittosporum viridiflorum	African Cheesewood	Low	Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, North West, Western Cape	**LC:P**
Afrocarpus falcatus	Small-leaved Yellowwood	Low	From the Southern Western Cape, through the Eastern Cape and KwaZulu-Natal, and northwards to Mpumalanga and Limpopo and also eastwards to Mozambique	**LC:P**
Sideroxylon inerme	White-milkwood	Confirmed	This species is commonly found in dune forests, almost always in coastal woodlands and also in littoral forests (forests along the sea-shore). It also occurs further inland in Zimbabwe and Gauteng Suitable habitat on site: Located within the lower Eastern portion of the OHPL within the Thicket Patches Sub-Unit	**LC:P**
Ocotea bullata	Southern Stinkwood	Low	Widespread in South Africa from the Cape Peninsula to the Wolkberg Mountains in Limpopo	**EN:P**
Podocarpus latifolius	Broad-leaved Yellowwood	Low	Eastern Cape, Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape, Western Cape	**LC:P**
Curtisia denata	Assegaai	Low	Forest patches of the eastern Western Cape to the forests of the Knysna region, the Eastern Cape, KwaZulu-Natal, Mpumalanga, Limpopo, and Swaziland.	**P:NT**

CR = Critically Endangered**, EN** = Endangered**, EW** = Extinct in the Wild**, NT** = Near Threatened**, VU** = Vulnerable**, P** = Protected, **POC** = Probability of Occurrence.

NEMBA TOPS List for South Africa[16]

Table C3: TOPS list for South Africa – plant species.

NEMBA TOPS LIST (PLANT SPECIES)				
Scientific Name	**Common Name**	**POC**	**Provincial Distribution**	**Conservation Status**
Adenium swzicum	Swaziland Impala Lily	Low	It occurs in Swaziland, southern parts of Mozambique and in South Africa where it occurs in Mpumalanga and northern KwaZulu-Natal	CR
Aloe pillansii	False Quiver Tree	Low	Extreme northwestern parts of the Northern Cape and the southwestern extremities of Namibia at altitudes ranging from 250-1000m	CR
Diaphanante millarii	Tree Orchid	Low	Eastern Cape, KwaZulu-Natal	CR
Dioscorea ebutsiniorum	Wild Yam	Low		
Encephalartos aemulans	Ngotshe Cycad	Low	KwaZulu-Natal	CR
Encephalartos brevifoliolatus	Escarpment Cycad	Low	Limpopo	CR
Encephalartos cerinus	Waxen Cycad	Low	KwaZulu-Natal	CR
Encephalartos dolomiticus	Wolkberg Cycad	Low	Limpopo	CR
Encephalartos heenanii	Woolly Cycad	Low	Mpumalanga	CR
Encephalartos hirustus	Venda Cycad	Low	Limpopo	CR
Encephalartos inopinus	Lydenburg Cycad	Low	Restricted to Mpumalanga	CR
Encephalartos latifrons	Albany Cycad		Occurs in scattered groups in the Eastern Cape Province	CR
Encephalartos middelburgensis	Middelburg Cycad	Low	The Middelburg cycad occurs in Mpumalanga	CR
Encephalartos nubimontanus	Blue Cycad	Low	Cliff faces in low, open, deciduous woodland in the mountains north of Penge.	CR
Encephalartos woodii	Wood's Cycad	Low	Extinct in the wild	CR
Aloe albida	Grass Aloe	Low	Mpumalanga	VU
Encephalartos cycadifolius	Winterberg Cycad	Low	Restricted distribution in the Winterberg Mountains in the Bedford and Cradock areas	VU
Encephalartos eugene-maraisii	Waterberg Cycad	Low	This species is endemic to South Africa where it grows in the Waterberg and adjacent areas among low shrubs on rocky hills and steep slopes in open grassland and savanna	VU
Merwilla plumbea	Blue Squill	Low	KwaZulu-Natal, Mpumalanga	VU
Zantedeschia jucunda	Yellow Arum Lily	Low	Limpopo	VU
Adenia wilmsii		Low	Mpumalanga	P
Aloe simii		Low	Mpumalanga	P
Clivia mirabilis	Oorlogskloof Bush Lily	Low	Northern Cape, Western Cape	P
Disa macrostachya		Low	Northern Cape	P
Disa nubigena		Low	Western Cape	P
Disa physodes		Low	Western Cape	P

[16] National Environmental Management: Biodiversity Act 10 of 2004 - Threatened or Protected Species Regulations, 2007. Government Notice R152 in Government Gazette 29657 dated 23 February 2007. Commencement date: 1 June 2007 [GN R150, Gazette no. 29657], as amended.

Disa procera		Low	Western Cape	P
Disa sabulosa		Low	Western Cape	P
Encephalartos altenstinii	Bread Palm	Low	Widely distributed in the coastal bush from the Bushman's River in the south-eastern Cape to the southern border of Kwazulu-Natal.	P
Encephalartos caffer	Breadfruit Tree	Medium	Coastal-belt grassland, often among rocks, in the districts of Humansdorp, Albany, Bathurst and East London; in the former Transkei in the district of Kentani, and as far east as Willowvale Suitable habitat on site: There are potential suitable conditions for this species to occur within the distribution of the OHPL but due to potential harvesting threats, their potential occurrence will not be disclosed.	P
Encephalartos dyerianus	Lowveld Cycad	Low	Limpopo	P
Encephalartos friderici-guiliemi		Low	Districts of Queenstown and Cathcart.	P
Encephalartos ghellinckii		Low	Eastern Cape, KwaZulu-Natal	P
Encephalartos humulis		Low	??	P
Encephalartos lamatus		Low	??	P
Encephalartos lehmannii		Low	This plant is endemic to the interior of Eastern Cape in South Africa where it grows in the catchments of several rivers.	P
Encephalartos longifolius		Low	Widely distributed in the southwestern parts of the Eastern Cape	P
Encephalartos natalensis	Natal Giant Cycad	Low	Occurring from Tabankulu in the northern part of the Eastern Cape, through most of KwaZulu-Natal, up to the upper catchment area of the Umfolozi River, near Vryheid in the north	P
Encephalartos paucidentatus		Low	Mpumalanga	P
Encephalartos princeps		Medium	Endemic to South Africa and is restricted to the catchment area of the Great Kei River (Eastern Cape). The plants grow in riverine scrub between rocks and on doleritic cliffs Suitable habitat on site: There are potential suitable conditions for this species to occur within the distribution of the OHPL but due to potential harvesting threats, their potential occurrence will not be disclosed.??	P
Encephalartos senticosus		Low	KwaZulu-Natal, northwards to a few kilometres north of Siteki in Swaziland	P
Encephalartos transvenosus	Modjagj Cycad	Low	Limpopo	P
Encephalartos trispinosus		Low	Endemic to South Africa and occurs in the valleys of the Bushman`s and Great Fish Rivers in the districts of Bathurst, Alexandria and Albany of the Eastern Cape	P
Encephalartos umbeluziensis		Low	Swaziland and Mozambique	P
Encephalartos villosus	Poor man's Cycad	Low	This species occurs from East London in the Eastern Cape extending eastwards through the Transkei, KwaZulu-Natal and as far as Swaziland.	P
Euphorbia clivicola		Low	Limpopo	P

Euphorbia meloformis		**Low**	**Eastern Cape. Port Elizabeth to Grahamstown and eastwards to Peddie.**	**NT; P**
Euphorbia obesa		**Medium**	**Eastern Cape. Graaff-Reinet to Rietbron** **Suitable habitat on site: Potential to occur within the Sundays Valley Thicket Sub-Unit that is located in the middle portions of the OHPL which currently sustains many Euphorbia species and therefore habitat conditions should be present.**	**P**
Harpagophytum procumbens	**Devil's Claw**	**Low**		**P**
Harpogophytum zeyherii	**Devil's Claw**	**Low**		**P**
Hoodia gordonii	**Ghaap**	**Low**	**Free State, Northern Cape, Western Cape**	**P**
Hoodia currorii	**Ghaap**	**Low**	**Limpopo**	**P**
Protea odorata	**Swartland Sugarbush**	**Low**	**Western Cape**	**P**
Sangeria eriopus		**Low**	**Eastern Cape, KwaZulu-Natal**	**P**

CR = Critically Endangered**, EN** = Endangered**, EW** = Extinct in the Wild**, NT** = Near Threatened**, VU** = Vulnerable**, P** = Protected, **POC** = Probability of Occurrence.

APPENDIX D: Impact Assessment Methodology

This section outlines the proposed method for assessing the significance of the potential environmental impacts. For each predicted impact, criteria are ascribed, and these include the intensity (size or degree scale), which also includes the type of impact, being either a positive or negative impact; the duration (temporal scale); and the extent (spatial scale), as well as the probability (likelihood). The methodology is quantitative, whereby professional judgement is used to identify a rating for each criterion based on a seven-point scale (refer to Table 1); and the significance is auto-generated using a spreadsheet through application of the calculations in Figure 1 in Part A. Specialists can comment where they disagree with the auto-calculated impact significance rating

The calculations for each predicted impact, certain criteria are applied to establish the likely significance of the impact, firstly in the case of no mitigation being applied and then with the most effective mitigation measure(s) in place.

These criteria include the intensity (size or degree scale), which also includes the type of impact, being either a positive or negative impact; the duration (temporal scale); and the extent (spatial scale). These numerical ratings are used in an equation whereby the consequence of the impact can be calculated. Consequence is calculated as follows:

Consequence = type x (intensity + duration + extent)

To calculate the significance of an impact, the probability (or likelihood) of that impact occurring is applied to the consequence.

Significance = consequence x probability

Depending on the numerical result, the impact would fall into a significance category as negligible, minor, moderate or major, and the type would be either positive or negative.

Table D1: Assessment criteria for the evaluation of impacts

CRITERIA	CATEGORY	DESCRIPTION	
Project phase	**Construction**		
	Operation		
	Decommissioning		
Mitigatability	**Low**	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts	
	Medium	Mitigation exists and will notably reduce significance of impacts	
	High	Mitigation exists and will considerably reduce the significance of impacts	
Nature	**Positive**		1
	Negative		-1
Duration	**Immediate**	Impact will self-remedy immediately	1
	Brief	Impact will not last longer than 1 year	2
	Short term	impact will last between 1 and 5 years	3
	Medium term	Impact will last between 5 and 10 years	4
	Long term	Impact will last between 10 and 15 years	5
	On-going	Impact will last between 15 and 20 years	6
	Permanent	Impact may be permanent, or in excess of 20 years	7
Extent	**Very limited**	Limited to specific isolated parts of the site	1
	Limited	Limited to the site and its immediate surroundings	2
	Local	Extending across the site and to nearby settlements	3
	Municipal area	Impacts felt at a municipal level	4
	Regional	Impacts felt at a regional / provincial level	5
	National	Impacts felt at a national level	6
	International	Impacts felt at an international level	7
Intensity	**Negligible**	Natural and/ or social functions and/ or processes are negligibly altered	1
	Very low	Natural and/ or social functions and/ or processes are slightly altered	2
	Low	Natural and/ or social functions and/ or processes are somewhat altered	3
	Moderate	Natural and/ or social functions and/ or processes are moderately altered	4
	High	Natural and/ or social functions and/ or processes are notably altered	5

	Very high	Natural and/ or social functions and/ or processes are majorly altered	6
	Extremely high	Natural and/ or social functions and/ or processes are severely altered	7
Probability	**Highly unlikely / none**	Expected never to happen	1
	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere	2
	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur	3
	Probable	The impact has occurred here or elsewhere and could therefore occur	4
	Likely	The impact may occur	5
	Almost certain / Highly probable	It is most likely that the impact will occur	6
	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	7
Confidence	**Low**	Judgement is based on intuition	
	Medium	Determination is based on common sense and general knowledge	
	High	Substantive supportive data exists to verify the assessment	
Reversibility	**Low**	The affected environment will not be able to recover from the impact - permanently modified	
	Medium	The affected environment will only recover from the impact with significant intervention	
	High	The affected environmental will be able to recover from the impact	
Resource irreplaceability	**Low**	The resource is not damaged irreparably or is not scarce	
	Medium	The resource is damaged irreparably but is represented elsewhere	
	High	The resource is irreparably damaged and is not represented elsewhere	
Significance	**Negligible**		
	Minor		
	Moderate		
	Major		

Significance:	negative	positive
Negligible	Negligible - negative	Negligible - positive
Minor	Minor - negative	Minor - positive
Moderate	Moderate - negative	Moderate - positive
Major	Major - negative	Major - positive

APPENDIX E: Impact Assessment Results

Table E1: Individual Impact Assessments for the Construction and Maintenance phases on the floral habitat and diversity for each vegetation unit is shown below.

Ref:	Low Growing Shrubland	1

Project phase	**Construction**			
Impact	**Low Growing Shrubland-** • **Vegetation clearing results in a decrease in biodiversity functioning and habitat integrity due to vegetation clearing;** • **Spread of AIP; and** • **Soil erosion and degradation.**			
Description of impact	Physical clearing of vegetation cover, within the proposed footprint (15-meter radius) this can decrease in biodiversity functioning and habitat integrity. The potential spread of AIPs can replace natural vegetation and impact habitat functioning and integrity within this Sub-Unit. Construction activities can lead to soil compaction, leading to decrease in vegetation cover as floral establishment is impeded along with lower water infiltration rates. The potential for degraded soils to erode is also higher during or after construction activities.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	• **Restricting the movement and construction to and within the authorised footprint area, thereby limiting the impact on surrounding vegetation;** • **Clearing all construction material from site to avoid pollution and damage to the surrounding natural areas;** • **Restrict vegetation clearing to the minimum footprint area of the road to decrease the impact on habitat integrity and diversity;** • **Edge effects of all construction activities, which may affect floral habitat within surrounding areas, are to be strictly managed, e.g., implement an AIP control plan from the get-go, mitigate soil erosion by reducing soil compaction caused by movement of construction personnel and vehicles, suppress dust in order to mitigate the impact of dust on flora within a close proximity of construction activities;** • **No indiscriminate driving through the veld is allowed. As far as possible vehicles are to utilise the existing roads. Where this is not feasible, new roads are to be located in areas of existing high disturbance, and not encroach upon sensitive habitats; and** • **Linear developments are often corridors along which disturbances occur and AIPs spread. The proposed project should thus manage disturbances and AIPs along the entire extent as well as within a 15 m buffer (Environmental buffer) surrounding the road. This will decrease the potential for AIPs to become a significant threat to indigenous flora.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	The impact will last between 1 and 5 years	Short term	The impact will last between 1 and 5 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment

Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	Since the Low Growing Shrubland Sub-Unit is currently experiencing grazing impacts and presence of AIPs (however limited) the construction phase of the proposed OHPL powerline won't affect the habitat integrity and diversity to such an extent that is not already present, however if properly mitigated the impact can be limited to a small extent and not to severe.			
Cumulative impacts	The cumulative effect of construction of the habitat and diversity of the LGS is minimal due to the poor condition of this Sub-Unit and the level of transformation already present. The impact on vegetation clearing and possible spread of AIPs can be minimal with mitigation measures being considered.			

Ref:	Scattered Bush Clumps	2

Project phase	**Construction**			
Impact	**Scattered Bush Clumps-** • **Vegetation clearing results in a decrease in biodiversity functioning and habitat integrity due to vegetation clearing;** • **Spread of AIP; and** • **Soil erosion and degradation.**			
Description of impact	Physical clearing of vegetation cover, within the proposed footprint (15-meter radius) this can decrease in biodiversity functioning and habitat integrity. The potential spread of AIPs can replace natural vegetation and impact habitat functioning and integrity within this Sub-Unit. Construction activities can lead to soil compaction, leading to decrease in vegetation cover as floral establishment is impeded along with lower water infiltration rates. The potential for degraded soils to erode is also higher during or after construction activities.			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	• **Access roads should be kept to existing roads, as far as possible, so as to reduce fragmentation of natural habitat outside of the authorised footprint;** • **Upon completion of construction activities, it must be ensured that no bare areas remain, and that indigenous species be used to revegetate the disturbed area;** • **Restricting the movement and construction to and within the authorised footprint area, thereby limiting the impact on surrounding vegetation;** • **Clearing all construction material from site to avoid pollution and damage to the surrounding natural areas;** • **Restrict vegetation clearing to the minimum footprint area of the road to decrease the impact on habitat integrity and diversity;** • **Edge effects of all construction activities, which may affect floral habitat within surrounding areas, are to be strictly managed, e.g., implement an AIP control plan from the get-go, mitigate soil erosion by reducing soil compaction caused by movement of construction personnel and vehicles, suppress dust in order to mitigate the impact of dust on flora within a close proximity of construction activities;** • **No indiscriminate driving through the veld is allowed. As far as possible vehicles are to utilise the existing roads. Where this is not feasible, new roads are to be located in areas of existing high disturbance, and not encroach upon sensitive habitats; and** • **Linear developments are often corridors along which disturbances occur and AIPs spread. The proposed project should thus manage disturbances and AIPs along the entire extent as well as within a 15 m buffer (Environmental buffer) surrounding the road. This will decrease the potential for AIPs to become a significant threat to indigenous flora**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	impact will last between 1 and 5 years	Short term	impact will last between 1 and 5 years

Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	This habitat unit is especially threatened by AIPs, however with proper mitigation and AIP management plans the impact should be minimal.			
Cumulative impacts	There are currently moderate levels of transformation already present therefore the additional impacts should be minimal.			

Ref:	Tree Dominated Shrublands	3

Project phase	**Construction**			
Impact	**Tree Dominated Shrublands-** • **Vegetation clearing results in a decrease in biodiversity functioning and habitat integrity due to vegetation clearing;** • **Spread of AIP; and** • **Soil erosion and degradation.**			
Description of impact	Vegetation clearing within the proposed footprint (15-meter radius) can decrease the biodiversity functioning and habitat integrity of this Sub-Unit. The potential spread of AIPs can replace natural vegetation and impact habitat functioning and integrity within this Sub-Unit. Construction activities can lead to soil compaction, leading to decrease in vegetation cover as floral establishment is impeded along with lower water infiltration rates. The potential for degraded soils to erode is also higher during or after construction activities.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	• **See previous table** • **Clearing all construction material from site to avoid pollution and damage to the surrounding natural areas; and** • **Upon completion of construction activities, it must be ensured that no bare areas remain, and that indigenous species be used to revegetate the disturbed area**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	The impact will last between 1 and 5 years	Short term	The impact will last between 1 and 5 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Low	Natural and/ or social functions and/ or processes are somewhat altered

Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	Due to the nature of this habitat unit (species composition and structure) the impact of vegetation clearing will pose a minimal risk. Due to the exposed conditions of the habitat unit AIPs can easily spread and become naturalized therefore impact should be mitigated to decrease potential impact. Furthermore, the soil present within this site is easily erodible and therefore mitigation measure surrounding the prevention of soil loss or degradation is important within this vegetation unit.			
Cumulative impacts	The cumulative effect of construction of the habitat and diversity of the TDS Sub-Unit is minimal due to the poor natural condition of this Sub-Unit. Due to the extensive levels of transformation already present impacts should be minimal yet still mitigated to prevent further loss of biodiversity.			

Ref:	Sundays Valley Thicket	4

Project phase	**Construction**			
Impact	**Sundays Valley Thicket-** • **Vegetation clearing, decrease in biodiversity functioning and habitat integrity due to loss of vegetation cover;** • **Fragmentation of this Sub -Unit;** • **Spread of AIP ;** • **Loss of significant and specialised habitat conditions; and** • **Loss of downslope vegetation communities beyond the approved footprint areas.**			
Description of impact	Vegetation clearing within the proposed footprint (15-meter radius) can decrease the biodiversity functioning and habitat integrity and important biodiversity areas. The potential spread of AIPs can replace natural vegetation and impact habitat functioning, diversity and integrity of this Sub-Unit. Downslope smothering with soils and debris can influence habitat unit beyond authorised footprint area and result in a loss of vegetation and soil. The potential for degraded soils to erode is also higher during or after construction activities.			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	• **See previous table;** • **Appropriate shaping of disturbed areas is essential. To promote successful establishment of vegetation, the slopes must not be steeper than 1(V):5(H) or 1(V):3(H) (depending on engineering input and recommendations). New slopes should resemble/mimic the natural topography of the surrounding area. Where slopes are left steeper than what is recommended for whatever reason, additional measures will be required to prevent soil erosion and to appropriately manage stormwater; and** • **Stabilizing slope regions and avoiding rocky outcrop areas could potentially limit the impact on the natural environment. Furthermore, rehabilitation of such sensitive microsites can be challenging.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	The impact will last between 1 and 5 years	Short term	The impact will last between 1 and 5 years

Extent	Municipal Area	Impacts felt at a municipal level	Municipal Area	Impacts felt at a municipal level
Intensity	High	Natural and/ or social functions and/ or processes are notably altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	Medium	The affected environment will only recover from the impact with significant intervention
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Moderate - negative**		**Moderate - negative**	
Comment on significance	This vegetation unit is classified as an ESA and therefore activities within these areas are permitted under certain restrictions, this Habitat Unit does contain significant biodiversity drivers such as key stone species (*P. affra*) where the impact should be minimized in order to mitigate the impact on the habitat integrity and functioning of this habitat unit. Only with continues mitigation can impact on the Habitat Unit be properly mitigated.			
Cumulative impacts	The cumulative effect of construction of the habitat and diversity within the SVT Habitat Unit is low due to the difficulty working within this Habitat Unit. Therefore the probable increase in spread of AIPs is an potential cumulative impact (Considering the Wind station nearby).			

Ref:	Thicket Patches	5		
Project phase	**Construction**			
Impact	**Calcareous Grasslands-** • **Vegetation clearing results in a decrease in biodiversity functioning and habitat integrity due to vegetation clearing;** • **Spread of AIP; and** • **Soil erosion and degradation.**			
Description of impact	Vegetation clearing within the proposed footprint (15-meter radius) can decrease the biodiversity functioning and habitat integrity of this Sub-Unit. The potential spread of AIPs can replace natural vegetation and impact habitat functioning and integrity within this Sub-Unit. Construction activities can lead to soil compaction, leading to decrease in vegetation cover as floral establishment is impeded along with lower water infiltration rates. The potential for degraded soils to erode is also higher during or after construction activities.			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	• **See previous table;** • **Clearing all construction material from site to avoid pollution and damage to the surrounding natural areas; and** • **Upon completion of construction activities, it must be ensured that no bare areas remain, and that indigenous species be used to revegetate the disturbed area.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	The impact will last between 1 and 5 years	Short term	impact will last between 1 and 5 years

Extent	Local	Extending across the site and to nearby settlements	Very limited	Limited to specific isolated parts of the site
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	Without mitigation the disturbed sites can become possible AIP introduction sites which will decrease this sites diversity and functionality. However, with proper application of mitigation measures the impact can be minimal.			
Cumulative impacts	The cumulative effect of construction of the wind turbines and the OHPL of this Sub-Unit is moderately high as current transformation and AIP abundance is moderately high (as a result also of the small extent of this vegetation unit). However due to the limited extent of this Sub-Unit impact should be limited to already transformed areas to maintain habitat diversity patterns.			

Ref:	Calcareous Grasslands	6

Project phase	**Construction**			
Impact	**Thicket Patches-** • **Vegetation clearing, decrease in biodiversity functioning and habitat integrity due to loss of vegetation cover;** • **Spread of AIP ; and** • **Soil erosion and degradation**			
Description of impact	Vegetation clearing within the proposed footprint (15-meter radius) can decrease the biodiversity functioning and habitat integrity of this Sub-Unit. Due to the high abundance of AIPs within this Sub-Unit has the potential to spread and replace natural vegetation, impacting habitat functioning and integrity within this Sub-Unit. Construction activities can lead to soil compaction, leading to decrease in vegetation cover as floral establishment is impeded along with lower water infiltration rates. The potential for degraded soils to erode is also higher during or after construction activities.			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	• **See previous table;** • **Removal of AIP species should preferably commence during the planning phase and continue throughout the construction and operational phases thereby ensuring that no AIP propagules are spread with construction rubble, or soils contaminated with AIP seeds during the construction phase** • **Clearing all construction material from site to avoid pollution and damage to the surrounding natural areas; and** • **Upon completion of construction activities, it must be ensured that no bare areas remain, and that indigenous species be used to revegetate the disturbed area**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	The impact will last between 1 and 5 years	Short term	The impact will last between 1 and 5 years

Extent	Local	Extending across the site and to nearby settlements	Limited	Limited to the site and its immediate surroundings
Intensity	High	Natural and/ or social functions and/ or processes are notably altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	Medium	The affected environment will only recover from the impact with significant intervention
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Low	The resource is not damaged irreparably or is not scarce
Significance	**Moderate - negative**		**Minor - negative**	
Comment on significance	The AIPs present/abundant within this habitat unit can easily become wide-spread and impact vegetation structure, composition and ecosystem functioning. With monitoring and mitigation protocols in place before, during construction and after construction activities the impact could be limited.			
Cumulative impacts	The cumulative effect of construction within this Sub-Unit can impact floral habitat and diversity within the TP Sub-Unit. The additional potential/probability of AIPs becoming abundant is moderately high due to the current presence and extent of AIPs and increase movement within and between sites.			

Ref:	Transformed Areas	7

Project phase	**Construction**			
Impact	**Transformed Areas-** • **Vegetation clearing, decrease in biodiversity functioning and habitat integrity due to loss of vegetation cover;** • **Spread of AIP ; and** • **Soil erosion and degradation**			
Description of impact	The loss of vegetation through vegetation clearing will ultimately decrease the habitat functionality and integrity. The loss of natural vegetation can potentially be replaced with AIP that will further transform this Habitat Unit. Increase movement and construction activities can also decrease soil stability and lead to soil erosion and soil degradation limiting the recovery of natural vegetation.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	• **Access roads should be kept to existing roads, as far as possible, so as to reduce fragmentation of natural habitat outside of the authorised footprint;** • **Do not extend boundaries of these footprint areas; and** • **Removal of AIP species should preferably commence during the planning phase and continue throughout the construction and operational phases thereby ensuring that no AIP propagules are spread with construction rubble, or soils contaminated with AIP seeds during the construction phase.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	The impact will last between 1 and 5 years	Short term	The impact will last between 1 and 5 years
Extent	Local	Extending across the site and to nearby settlements	Limited	Limited to the site and its immediate surroundings

Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	The AIPs present/abundant within this habitat unit can easily become wide-spread and impact vegetation structure, composition and ecosystem functioning of nearby habitat units. With monitoring and mitigation protocols in place before and during construction the impact could be limited, and effects of AIPs mitigated to a preferred level.			
Cumulative impacts	Cumulative impacts are limited as the activities occurring within or around these Habitat Unit are limited			

Ref:	Other Drainage Features	8

Project phase	**Construction**			
Impact	**Other Drainage Features-** • **Vegetation clearing, decrease in biodiversity functioning and habitat integrity due to loss of vegetation cover;** • **Spread of AIP ; and** • **Soil erosion and degradation**			
Description of impact	The loss of vegetation through vegetation clearing will ultimately decrease the habitat functionality and integrity. The loss of natural vegetation can potentially be replaced with AIP that will further transform this Habitat Unit. Increase movement and construction activities can also decrease soil stability and lead to soil erosion and soil degradation limiting the recovery of natural vegetation.			
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	• **Access roads should be kept to existing roads, as far as possible, so as to reduce fragmentation of natural habitat outside of the authorised footprint;** • **Do not extend boundaries of these footprint areas; and** • **Removal of AIP species should preferably commence during the planning phase and continue throughout the construction and operational phases thereby ensuring that no AIP propagules are spread with construction rubble, or soils contaminated with AIP seeds during the construction phase.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	The impact will last between 1 and 5 years	Short term	The impact will last between 1 and 5 years
Extent	Local	Extending across the site and to nearby settlements	Limited	Limited to the site and its immediate surroundings
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Low	Natural and/ or social functions and/ or processes are somewhat altered

Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Low	The affected environment will not be able to recover from the impact - permanently modified	Medium	The affected environment will only recover from the impact with significant intervention
Resource irreplaceability	High	The resource is irreparably damaged and is not represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	The AIPs present/abundant within this habitat unit can easily become wide-spread and impact vegetation structure, composition and ecosystem functioning of nearby habitat units. With monitoring and mitigation protocols in place before and during construction the impact could be limited, and effects of AIPs mitigated to a preferred level.			
Cumulative impacts	Higher probability of spread of AIPs within this Sub-Unit and therefore potential damage to ecologically important sites due to travel.			

Ref:	Watercourse	9

Project phase	**Construction**			
Impact	**Watercourse-** • **Vegetation clearing, decrease in biodiversity functioning and habitat integrity due to loss of vegetation cover;** • **Spread of AIP ; and** • **Soil erosion and degradation**			
Description of impact	The loss of vegetation through vegetation clearing will ultimately decrease the habitat functionality and integrity. The loss of natural vegetation can potentially be replaced with AIP that will further transform this Habitat Unit. Increase movement and construction activities can also decrease soil stability and lead to soil erosion and soil degradation limiting the recovery of natural vegetation.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	• **Construction and/or alterations within this habitat unit is highly advised against, not only is wetlands protected under certain legislative documents they are of ecologically important ESA.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Medium term	The impact will last between 5 and 10 years	Short term	The impact will last between 1 and 5 years
Extent	Local	Extending across the site and to nearby settlements	Limited	Limited to the site and its immediate surroundings
Intensity	High	Natural and/ or social functions and/ or processes are notably altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment

Reversibility	Low	The affected environment will not be able to recover from the impact - permanently modified	Medium	The affected environment will only recover from the impact with significant intervention
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	These areas are not considered floristically important however they can act as corridors for the spread of AIPs therefore the active monitoring and disposal of AIPs need to be implemented which can mitigate the effect of the construction phase on this and surrounding Habitat Units. Furthermore, wetland habitats are protected under NWA and therefore remains of high ecological importance and should be avoided in all phases of development			
Cumulative impacts	Activities within these sites are discourage and not-common therefore, impact should be minimal			

Ref:	Low Growing Shrubland	10

Project phase	**Operation**			
Impact	**Low Growing Shrublands-** • **Regular vegetation clearing;** • **Decrease in biodiversity and habitat integrity due to AIP proliferation; and** • **Continuing erosion as a result of ongoing activities**			
Description of impact	The more regular disturbance as a result of access to the Habitat unit can lead to an increase in the possible spread of AIPs, which can alter the structure and ultimately the functioning of the natural ecosystems within the Study Area. Increased introduction and proliferation of alien plant species due to a lack of maintenance activities, or poorly implemented and monitored AIP Management programme can lead to ongoing displacement of natural vegetation outside of the footprint area. On-going disturbance during the operational phase may lead to erosion and sedimentation of surrounding floral habitat. Failure to concurrently rehabilitate bare areas or disturbed sites outside of the authorised footprints, potentially resulting in loss of viable soils, increasing erosion risk and/or permitting the proliferation of AIPs. Regular vegetation contributed to continues loss in natural vegetation and regular disturbance can promote IP proliferation within this Sub-Unit			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	• **Activity and movement should be limited within already existing access roads and/or new access road, with limited exposure or access to the surrounding natural areas;** • **Edge effects arising from the proposed development, such as erosion and alien plant species proliferation, which may affect adjacent natural areas, need to be strictly managed. Specific mention in this regard is made of Category 1b AIP species (as listed in the NEMBA Alien species lists, 2020), in line with the NEMBA Alien and Invasive Species Regulations (2020); and** • **Implement erosion control measures where necessary to ensure that further habitat loss does not occur; and** • **All soils compacted because of maintenance activities should be ripped and reprofiled to natural levels and revegetated with indigenous vegetation. Establishment of reintroduced vegetation within such disturbed areas must be monitored as part of maintenance activities to ensure no cumulative loss of floral habitat**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Local	Extending across the site and to nearby settlements	Very limited	Limited to specific isolated parts of the site
Intensity	Very low	Natural and/ or social functions and/ or processes are slightly altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered

Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	Probable	The impact has occurred here or elsewhere and could therefore occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	High	The resource is irreparably damaged and is not represented elsewhere
Significance	**Minor - negative**		**Negligible - negative**	
Comment on significance	If monitoring and management plans of AIPs is effective this could limit the spread of AIPs within this habitat unit.			
Cumulative impacts	The cumulative effect of construction of the habitat and diversity of the LGS is minimal due to the poor condition of this Sub-Unit and the level of transformation already present. The impact on vegetation clearing and possible spread of AIPs can be minimal with mitigation measures being considered.			

Ref:	Scattered Bush Clumps	11

Project phase	**Operation**			
Impact	**Scattered Bush Clumps-** • **Regular vegetation clearing;** • **Decrease in biodiversity and habitat integrity due to AIP proliferation; and** • **Continuing erosion as a result of ongoing activities**			
Description of impact	Movement between neighbouring habitat units can promote the spread of AIPs between nearby habitat units which could potentially lead to more introductions of AIPs. Increased access to the sites can also increase soil erosion and degradation process impeding of habitat functioning. Regular vegetation clearing contributes to continues loss in natural vegetation and regular disturbance can promote IP proliferation within this Sub-Unit.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	• **Activity and movement should be limited within already existing access roads and/or new access road, with limited exposure or access to the surrounding natural areas;** • **Edge effects arising from the proposed development, such as erosion and alien plant species proliferation, which may affect adjacent natural areas, need to be strictly managed. Specific mention in this regard is made of Category 1b AIP species (as listed in the NEMBA Alien species lists, 2020), in line with the NEMBA Alien and Invasive Species Regulations (2020);** • **Implement erosion control measures where necessary to ensure that further habitat loss does not occur; and** • **All soils compacted because of maintenance activities should be ripped and reprofiled to natural levels and revegetated with indigenous vegetation. Establishment of reintroduced vegetation within such disturbed areas must be monitored as part of maintenance activities to ensure no cumulative loss of floral habitat**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site

Intensity	Very low	Natural and/ or social functions and/ or processes are slightly altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Likely	The impact may occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Negligible - negative**	
Comment on significance	If monitoring and management plans of AIPs is effective this could limit the spread of AIPs within this Sub-Unit to an acceptable level			
Cumulative impacts	Since there are now other major development activities taking place in this Sub-unit the cumulative impact is minimal			

Ref:	Tree Dominated Shrublands	12

Project phase	**Operation**			
Impact	**Tree Dominated Shrublands-** • **Regular vegetation clearing;** • **Decrease in biodiversity and habitat integrity due to AIP proliferation; and** • **Continuing erosion as a result of ongoing activities**			
Description of impact	Movement between neighbouring habitat units can promote the spread of AIPs between nearby habitat units which could potentially lead to more introductions of AIPs. Increased access to the sites can also increase soil erosion and degradation process impeding of habitat functioning. Regular vegetation clearing contributes to continues loss in natural vegetation and regular disturbance can promote AIP proliferation within this Sub-Unit.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	• **Activity and movement should be limited within already existing access roads and/or new access road, with limited exposure or access to the surrounding natural areas;** • **Edge effects arising from the proposed development, such as erosion and alien plant species proliferation, which may affect adjacent natural areas, need to be strictly managed. Specific mention in this regard is made of Category 1b AIP species (as listed in the NEMBA Alien species lists, 2020), in line with the NEMBA Alien and Invasive Species Regulations (2020);** • **Implement erosion control measures where necessary to ensure that further habitat loss does not occur; and** • **All soils compacted because of maintenance activities should be ripped and reprofiled to natural levels and revegetated with indigenous vegetation. Establishment of reintroduced vegetation within such disturbed areas must be monitored as part of maintenance activities to ensure no cumulative loss of floral habitat**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site

Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Likely	The impact may occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	This habitat unit is widespread with a low species richness and abundance, therefore possible potential increase in AIPs can alter natural vegetation functions and habitat integrity. However, with proper mitigation of AIP the impacts can be minimal.			
Cumulative impacts	Since there are no other major development activities taking place in this Sub-unit the cumulative impact is minimal an limited to potential increase in AIP proliferation.			

Ref:	Sundays Valley Thicket	13

Project phase	**Operation**	
Impact	**Sundays Valley Thicket-** • **Regular vegetation clearing;** • **Decrease in biodiversity and habitat integrity due to AIP proliferation; and** • **Continuing erosion as a result of ongoing activities**	
Description of impact	This habitat unit has a high species richness and while AIPs are present, they are not extensive, with regular disturbance they could become more abundant and affect the composition and ultimately the functioning of this habitat unit, decreasing habitat integrity. Increased movement within this Habitat Unit can impact soil compaction and soil erosion proses resulting in a loss of valuable top soil and vegetation function. Regular vegetation clearing contributes to continues loss in natural vegetation and regular disturbance can promote AIP proliferation.	
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts
Potential mitigation	• **Activity and movement should be limited within already existing access roads and/or new access road, with limited exposure or access to the surrounding natural areas;** • **Edge effects arising from the proposed development, such as erosion and alien plant species proliferation, which may affect adjacent natural areas, need to be strictly managed. Specific mention in this regard is made of Category 1b AIP species (as listed in the NEMBA Alien species lists, 2020), in line with the NEMBA Alien and Invasive Species Regulations (2020);** • **Implement erosion control measures where necessary to ensure that further habitat loss does not occur; and** • **All soils compacted because of maintenance activities should be ripped and reprofiled to natural levels and revegetated with indigenous vegetation. Establishment of reintroduced vegetation within such disturbed areas must be monitored as part of maintenance activities to ensure no cumulative loss of floral habitat**	
Assessment	**Without mitigation**	**With mitigation**
Nature	Negative	Negative

Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Local	Extending across the site and to nearby settlements	Limited	Limited to the site and its immediate surroundings
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Likely	The impact may occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	While robust this vegetation unit is also widespread, however due to current AIP abundance the impact of continuous disturbance and movement between sites can increase the probability and extent of AIPs. This increase in AIPs can alter the habitat integrity and functioning. However, with continues AIP management and mitigation activities the impact can be reduced.			
Cumulative impacts	Some section of the proposed OHPL is currently adjoining wind farms station which increases the amount of vegetation loss and probability of AIP proliferation due to increased movement within the area.			

Ref:	Calcareous Grasslands	14

Project phase	**Operation**	
Impact	**Calcareous Grasslands-** • **Regular vegetation clearing;** • **Decrease in biodiversity and habitat integrity due to AIP proliferation; and** • **Continuing erosion as a result of ongoing activities**	
Description of impact	Movement between neighbouring habitat units can promote the spread of AIPs between nearby habitat units which could potentially lead to more introductions of AIPs. Increased access to the sites can also increase soil erosion and degradation process impeding of habitat functioning. Regular vegetation clearing contributes to continues loss in natural vegetation and regular disturbance can promote AIP proliferation within this Sub-Unit.	
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts
Potential mitigation	• **Activity and movement should be limited within already existing access roads and/or new access road, with limited exposure or access to the surrounding natural areas;** • **Edge effects arising from the proposed development, such as erosion and alien plant species proliferation, which may affect adjacent natural areas, need to be strictly managed. Specific mention in this regard is made of Category 1b AIP species (as listed in the NEMBA Alien species lists, 2020), in line with the NEMBA Alien and Invasive Species Regulations (2020);** • **Implement erosion control measures where necessary to ensure that further habitat loss does not occur; and** • **All soils compacted because of maintenance activities should be ripped and reprofiled to natural levels and revegetated with indigenous vegetation. Establishment of reintroduced vegetation within such disturbed areas must be monitored as part of maintenance activities to ensure no cumulative loss of floral habitat**	
Assessment	**Without mitigation**	**With mitigation**

Nature	Negative		Negative	
Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Likely	The impact may occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	With AIP management and monitoring plans in place the impact of operations within this Sub-Unit can be limited.			
Cumulative impacts	Some section of the proposed OHPL is currently adjoining wind farms station which increases the amount of vegetation loss and probability of AIP proliferation due to increased movement within the area.			

Ref:	Thicket Patches	15

Project phase	**Operation**			
Impact	**Thicket Patches-** • **Regular vegetation clearing;** • **Decrease in biodiversity and habitat integrity due to AIP proliferation; and** • **Continuing erosion as a result of ongoing activities**			
Description of impact	Movement between neighbouring habitat units can promote the spread of AIPs between nearby habitat units which could potentially lead to more introductions of AIPs. Increased access to the sites can also increase soil erosion and degradation process impeding of habitat functioning. Regular vegetation clearing contributes to continues loss in natural vegetation and regular disturbance can promote AIP proliferation within this Sub-Unit.			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	• **Activity and movement should be limited within already existing access roads and/or new access road, with limited exposure or access to the surrounding natural areas;** • **Edge effects arising from the proposed development, such as erosion and alien plant species proliferation, which may affect adjacent natural areas, need to be strictly managed. Specific mention in this regard is made of Category 1b AIP species (as listed in the NEMBA Alien species lists, 2020), in line with the NEMBA Alien and Invasive Species Regulations (2020);** • **Implement erosion control measures where necessary to ensure that further habitat loss does not occur; and** • **All soils compacted because of maintenance activities should be ripped and reprofiled to natural levels and revegetated with indigenous vegetation. Establishment of reintroduced vegetation within such disturbed areas must be monitored as part of maintenance activities to ensure no cumulative loss of floral habitat**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	

Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Likely	The impact may occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	Due to the extent of AIPs within this Sub-Unit the implementation of AIP management and monitoring plans are essential to mitigate the impact of operational phase on this Sub-Unit. However, with proper mitigation practices the impact of AIP proliferation can be limited.			
Cumulative impacts	Some section of the proposed OHPL is currently adjoining wind farms station which increases the amount of vegetation loss and probability of AIP proliferation due to increased movement within the area.			

Ref:	Transformed Areas	16

Project phase	**Operation**			
Impact	**Transformed Areas-** • **Decrease in biodiversity and habitat integrity due to AIP proliferation; and** • **Continuing erosion as a result of ongoing activities**			
Description of impact	The potential risk of AIPs introduction and spread remain high due to the diversity and abundance of AIPs within this Sub-Unit, however, now also the probability of AIP proliferation increases. Furthermore, regular movement within this site can promote soil erosion and therefore impact habitat functioning ang integrity patterns.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	• **Activity and movement should be limited within already existing access roads and/or new access road, with limited exposure or access to the surrounding natural areas;** • **Edge effects arising from the proposed development, such as erosion and alien plant species proliferation, which may affect adjacent natural areas, need to be strictly managed. Specific mention in this regard is made of Category 1b AIP species (as listed in the NEMBA Alien species lists, 2020), in line with the NEMBA Alien and Invasive Species Regulations (2020);** • **Implement erosion control measures where necessary to ensure that further habitat loss does not occur; and** • **All soils compacted because of maintenance activities should be ripped and reprofiled to natural levels and revegetated with indigenous vegetation. Establishment of reintroduced vegetation within such disturbed areas must be monitored as part of maintenance activities to ensure no cumulative loss of floral habitat**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years

Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Very low	Natural and/ or social functions and/ or processes are slightly altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Likely	The impact may occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Negligible - negative**	
Comment on significance	AIPs are currently present within this habitat unit and could become extensive without proper interventions and monitoring, therefore with the implementation of an AIP management plan the proposed impacts can be minimised.			
Cumulative impacts	Due to other developments within the regions of these areas the possible proliferation of AIP can increase due to increased movement and access to sites			

Ref:	Other Drainage Features	17
Project phase	**Operation**	
Impact	**Other Drainage Features-** • **Regular vegetation clearing;** • **Decrease in biodiversity and habitat integrity due to AIP proliferation; and** • **Continuing erosion as a result of ongoing activities**	
Description of impact	Regular vegetation clearing within the servitude area decreases vegetation cover and therefore the habitat integrity and functioning, furthermore, clearing and associated movement can increase the probability for AIPs to establish within disturbed site. This will further decrease natural indigenous vegetation within this Sub-Unit. Increased access to the sites can also increase soil erosion and degradation process impeding of habitat functioning.	
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts
Potential mitigation	• **Activity and movement should be limited within already existing access roads and/or new access road, with limited exposure or access to the surrounding natural areas;** • **Edge effects arising from the proposed development, such as erosion and alien plant species proliferation, which may affect adjacent natural areas, need to be strictly managed. Specific mention in this regard is made of Category 1b AIP species (as listed in the NEMBA Alien species lists, 2020), in line with the NEMBA Alien and Invasive Species Regulations (2020);** • **Implement erosion control measures where necessary to ensure that further habitat loss does not occur; and** • **All soils compacted because of maintenance activities should be ripped and reprofiled to natural levels and revegetated with indigenous vegetation. Establishment of reintroduced vegetation within such disturbed areas must be monitored as part of maintenance activities to ensure no cumulative loss of floral habitat**	
Assessment	**Without mitigation**	**With mitigation**
Nature	Negative	Negative

Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Local	Extending across the site and to nearby settlements	Limited	Limited to the site and its immediate surroundings
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Likely	The impact may occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Low	The affected environment will not be able to recover from the impact - permanently modified	Medium	The affected environment will only recover from the impact with significant intervention
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	AIPs are currently present within this habitat unit and could become extensive without proper interventions and monitoring, therefore with the implementation of an AIP management plan the proposed impacts can be minimised.			
Cumulative impacts	Since there are no other major development activities taking place in this Sub-unit the cumulative impact is minimal an limited to potential increase in AIP proliferation.			

Ref:	Watercourse	18

Project phase	**Operation**			
Impact	**Watercourse-** • **Regular vegetation clearing;** • **Decrease in biodiversity and habitat integrity due to AIP proliferation; and** • **Continuing erosion as a result of ongoing activities**			
Description of impact	Access routes are often found to increase the abundance and distribution of AIPs and without proper monitoring this could impact surrounding habitat unit's integrity. Changes in species composition and structure within this Sub-Unit can alter its functioning therefore access to these sites are discourage but if necessary limited to existing access roads			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	• **Only use existing access routes to reached infrastructure, proper identification of new AIPs introductions.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Low	Natural and/ or social functions and/ or processes are somewhat altered

Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Likely	The impact may occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Low	The affected environment will not be able to recover from the impact - permanently modified	Medium	The affected environment will only recover from the impact with significant intervention
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	Vegetation clearing can alter habitat functioning and integrity, furthermore, increased movement within this site can lead to soil compaction and erosion disrupting various natural process and functions. However, while AIPs are currently present within this habitat unit and could become extensive with proper interventions and monitoring, of an AIP management plan the proposed impacts can be minimised. Wetland areas remain of ecological importance and are protected under the NWA therefore any activity is discouraged within this Sub-Unit.			
Cumulative impacts	Since there are now other major development activities taking place in this Sub-unit the cumulative impact is minimal an limited potential increase in AIP proliferation.			

Individual Impact Assessments for the Construction and Maintenance phases on the floral SCC for each vegetation unit is shown below

Ref:	Low Growing Shrubland	1

Project phase	**Construction**			
Impact	**Low Growing Shrublands-** • **Loss of vegetation due to vegetation clearing compromising possible habitats for SCC; and** • **Spread of AIPs limiting the natural extent for SCC.**			
Description of impact	Initial vegetation clearing removes a large extent of vegetation cover and thereby removing possible habitat sites for SCC to occur in. Furthermore, the spread of AIPs within the disturbed areas can lead to the additional loss of floral species diversity from surrounding natural habitat.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	• **Impact limited to the minimal footprint area;** • **A walkdown of the footprint area is required before construction activities can commence, where all anticipated floral SCC are searched and marked for relocation and/or destruction so that all necessary permits and authorisations can be obtained from authorities; and** • **Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed disturbance footprint area**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	The impact will last between 1 and 5 years	Short term	The impact will last between 1 and 5 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore

				there is a possibility that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Negligible - negative**		**Negligible - negative**	
Comment on significance	Since the POC for SCC are low within this Sub-unit the effect on SCC should be minimal.			
Cumulative impacts	Since there are no other major development activities taking place in this Sub-unit the cumulative impact is minimal an limited to potential increase in AIP proliferation.			

Ref:	Scattered Bush Clumps	2

Project phase	**Construction**			
Impact	**Scattered Bush Clumps-** • **Loss of vegetation due to vegetation clearing compromising possible habitats for SCC; and** • **Spread of AIPs limiting the natural extent for SCC.**			
Description of impact	Initial vegetation clearing removes a large extent of vegetation cover and thereby removing possible habitat sites for SCC to occur in. Furthermore, the spread of AIPs within the disturbed areas can lead to the additional loss of floral species diversity from surrounding natural habitat.			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	• **Impact limited to the minimal footprint area;** • **A walkdown of the footprint area is required before construction activities can commence, where all anticipated floral SCC are searched and marked for relocation and/or destruction so that all necessary permits and authorisations can be obtained from authorities;** • **Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed disturbance footprint area**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	The impact will last between 1 and 5 years	Short term	The impact will last between 1 and 5 years
Extent	Local	Extending across the site and to nearby settlements	Limited	Limited to the site and its immediate surroundings
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Almost certain / Highly probable	It is most likely that the impact will occur	Likely	The impact may occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact

Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	Presence of AIPs within this Sub-Unit already comprises of the transformed areas restricting SCC habitat therefore, impact within especially rocky outcrop areas and protected slopes should be avoided as this is areas where these species are more likely to occur. With implementation of mitigation measures the impact on SCC can be decrease and even considered to be minimal			
Cumulative impacts	Since there are now other major development activities taking place in this Sub-unit the cumulative impact is minimal an limited t potential increase in AIP proliferation.			

Ref:	Tree Dominated Shrublands	3

Project phase	**Construction**			
Impact	**Tree Dominated Shrublands-** • **Loss of vegetation due to vegetation clearing compromising possible habitats for SCC; and** • **Spread of AIPs limiting the natural extent for SCC.**			
Description of impact	Vegetation clearing decreases the potential habitat sites available for SCC. Furthermore, due to vegetation clearing AIPs can easily spread and become naturalized and replace natural vegetation limiting SCC habitat.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	• **Impact limited to the minimal footprint area;** • **A walkdown of the footprint area is required before construction activities can commence, where all anticipated floral SCC are searched and marked for relocation and/or destruction so that all necessary permits and authorisations can be obtained from authorities; and** • **Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed disturbance footprint area**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	The impact will last between 1 and 5 years	Short term	The impact will last between 1 and 5 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Very low	Natural and/ or social functions and/ or processes are slightly altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Low	The resource is not damaged irreparably or is not scarce
Significance	**Negligible - negative**		**Negligible - negative**	
Comment on significance	The effect of construction on SCC vegetation cover is expected to be minimal due to habitat being in a poor natural condition and that the POC for SCC is low within this Sub-Unit.			

Cumulative impacts	Since there are now other major development activities taking place in this Sub-unit the cumulative impact is minimal and limited potential of increase in AIP proliferation.

Ref:	Sundays Valley Thicket	4

Project phase	**Construction**			
Impact	**Sundays Valley Thicket-** • **Loss of SCC and RDL;** • **Restriction of habitat extent and favourable sites for other SCC that have a high POC; and** • **Spread of AIPs replacing natural vegetation;**			
Description of impact	The greatest impact will occur within the disturbance footprint area and will predominately be the impact on habitat integrity as the spread of AIPs can lead to the potential loss of floral species diversity from surrounding natural habitat. Loss of floral SCC plants from the study area with potential to impact on their population numbers and dynamics in the larger region. Dumping of construction material within areas where no construction is planned, thereby leading to further habitat disturbance allowing the establishment and spread of AIPs, therefore limiting SCC habitat.			
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	• **A walkdown of the footprint area is required before construction activities can commence, where all anticipated floral SCC are searched and marked for relocation and/or destruction so that all necessary permits and authorisations can be obtained from authorities where possible;** • **A rescue and relocation plan must be drafted and approved by the relevant authorities for all floral SCC that will potentially be impacted by the proposed development. A Floral SCC Management Plan must also be drafted and approved by the relevant authorities for all SCC that will not be impacted directly but that could be impacted by edge effect impacts from operational and maintenance phase activities. The SCC Management Plan can be incorporated into the Rehabilitation Plan and must focus on the protection of specific RDL, and NT species that form part of the Study Area ;** • **The construction footprint must be kept as small as possible in order to minimise impact on the surrounding environment (edge effect management);** • **Removal of vegetation must be restricted to what is absolutely necessary and should remain within the approved development footprint;** • **Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the construction activities. Additional road construction should be limited to what is absolutely necessary, and the footprint thereof kept to a minimal;** • **No collection of indigenous floral species must be allowed by construction personnel, especially with regards to floral SCC species; and** • **Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed development footprint area.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	The impact will last between 1 and 5 years	Short term	The impact will last between 1 and 5 years
Extent	Local	Extending across the site and to nearby settlements	Local	Extending across the site and to nearby settlements
Intensity	High	Natural and/ or social functions and/ or processes are notably altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment

Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	Medium	The affected environment will only recover from the impact with significant intervention
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Moderate - negative**		**Minor - negative**	
Comment on significance	The process of clearing vegetation within the servitude will impact several confirmed SCC an the probability of impacting more. In the case of SCC that can be rescued and relocated this should be investigated and all appropriate permits should be obtained for local and provincial authorities. The individuals that are not eligible for relocation should be avoided and impact within their vicinity minimized. With intensive mitigation practices can impacts on the SCC be minimised however, the impact can be sever.			
Cumulative impacts	The cumulative effect of construction on the SCC within the SVT Habitat Unit is moderately low however due to the wind farm construction in the vicinity additional probability of AIP proliferation and habitat fragmentation (loss of SCC habitat) is possible. suitability of conditions in this site			

Ref:	Calcareous Grasslands	5

Project phase	**Construction**			
Impact	**Calcareous Grasslands-** • **Loss of vegetation due to vegetation clearing compromising possible habitats for SCC; and** • **Spread of AIPs limiting the natural extent for SCC.**			
Description of impact	Vegetation clearing decreases the potential habitat sites available for SCC. Furthermore, due to vegetation clearing AIPs can easily spread and become naturalized and replace natural vegetation limiting SCC habitat.			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	• **Impact limited to the minimal footprint area;** • **A walkdown of the footprint area is required before construction activities can commence, where all anticipated floral SCC are searched and marked for relocation and/or destruction so that all necessary permits and authorisations can be obtained from authorities; and** • **Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed disturbance footprint area**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	The impact will last between 1 and 5 years	Short term	The impact will last between 1 and 5 years
Extent	Local	Extending across the site and to nearby settlements	Very limited	Limited to specific isolated parts of the site
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	Probable	The impact has occurred here or elsewhere and could therefore occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact

Resource irreplaceability	High	The resource is irreparably damaged and is not represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Minor - negative**		**Negligible - negative**	
Comment on significance	The effect of construction on SCC vegetation cover is expected to be minimal due to the low POC for SCC			
Cumulative impacts	Due to other developments within the regions of these areas the possible proliferation of AIP can increase due to increased movement and access to sites			

Ref:	Thicket Patches	6

Project phase	**Construction**			
Impact	**Thicket Patches-** • **Loss of SCC and RDL;** • **Restriction of habitat extent and favourable sites for other SCC that have a high POC; and** • **Spread of AIPs replacing natural vegetation;**			
Description of impact	The greatest impact will occur within the disturbance footprint area and will predominately be the impact on habitat integrity as the spread of AIPs can lead to the potential loss of floral species diversity from surrounding natural habitat. Loss of floral SCC plants from the study area with potential to impact on their population numbers and dynamics in the larger region. Dumping of construction material within areas where no construction is planned, thereby leading to further habitat disturbance allowing the establishment and spread of AIPs, therefore limiting SCC habitat.			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	• **A walkdown of the footprint area is required before construction activities can commence, where all anticipated floral SCC are searched and marked for relocation and/or destruction so that all necessary permits and authorisations can be obtained from authorities where possible;** • **A rescue and relocation plan must be drafted and approved by the relevant authorities for all floral SCC that will potentially be impacted by the proposed development. A Floral SCC Management Plan must also be drafted and approved by the relevant authorities for all SCC that will not be impacted directly but that could be impacted by edge effect impacts from operational and maintenance phase activities. The SCC Management Plan can be incorporated into the Rehabilitation Plan and must focus on the protection of specific RDL, and NT species that form part of the Study Area ;** • **The construction footprint must be kept as small as possible in order to minimise impact on the surrounding environment (edge effect management);** • **Removal of vegetation must be restricted to what is absolutely necessary and should remain within the approved development footprint;** • **Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the construction activities. Additional road construction should be limited to what is absolutely necessary, and the footprint thereof kept to a minimal;** • **No collection of indigenous floral species must be allowed by construction personnel, especially with regards to floral SCC species; and** • **Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed development footprint area.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	The impact will last between 1 and 5 years	Short term	The impact will last between 1 and 5 years
Extent	Local	Extending across the site and to nearby settlements	Local	Extending across the site and to nearby settlements
Intensity	High	Natural and/ or social functions and/ or processes are notably altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered

Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	Medium	The affected environment will only recover from the impact with significant intervention
Resource irreplaceability	High	The resource is irreparably damaged and is not represented elsewhere	High	The resource is irreparably damaged and is not represented elsewhere
Significance	**Moderate - negative**		**Minor - negative**	
Comment on significance	The SCC present on site should be avoided and protect during all phases of this project. Physical footprint should not be within a reasonable vicinity of the SCC and the impact of AIPs and vegetation clearing should be limited within these areas. With intensive management and mitigation activities the impact of the SCC can be minimised however, potentially not entirely avoided.			
Cumulative impacts	Due to additional construction and operational activities of a nearby wind farm, additional disturbance of soil and potential of AIP proliferation is expected due to increase access to the sites			

Ref:	Transformed Areas	7

Project phase	**Construction**			
Impact	**Transformed Areas-** • **Spread of AIPs; and** • **vegetation clearing**			
Description of impact	Initial vegetation clearing there is an expected loss in vegetation cover and natural habitat sites for SCC. Furthermore, with increased movement along and surrounding transformed areas AIPs can easily spread along transportation routes and influence surrounding habitat and the presence of SCC.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	• **Impact limited to the minimal footprint area;** • **A walkdown of the footprint area is required before construction activities can commence, where all anticipated floral SCC are searched and marked for relocation and/or destruction so that all necessary permits and authorisations can be obtained from authorities; and** • **Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed disturbance footprint area**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	The impact will last between 1 and 5 years	Short term	The impact will last between 1 and 5 years
Extent	Local	Extending across the site and to nearby settlements	Limited	Limited to the site and its immediate surroundings
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Likely	The impact may occur	Probable	The impact has occurred here or elsewhere and could therefore occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment

Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Negligible - negative**	
Comment on significance	Due to the overall low POC for SCC within this Habitat Unit the impact of construction on SCC should be minimal.			
Cumulative impacts	Due to additional construction and operational activities of a nearby wind farm, additional disturbance of soil and potential of AIP proliferation is expected due to increase access to the sites, however since there are loss probability of finding SCC this should be negligible.			

Ref:	Other Drainage Features	8

Project phase	**Construction**			
Impact	**Other Drainage Features-** • **Vegetation clearing, loss of potential SCC habitat; and** • **Spread of AIPs**			
Description of impact	The spread of AIPs can lead the potential loss of floral species diversity from surrounding natural habitat. Further loss in floral communities due to vegetation clearing can contribute to the loss in SCC habitat.			
Mitigatability	Low	Mitigation does not exist; or mitigation will slightly reduce the significance of impacts		
Potential mitigation	• **Impact limited to the minimal footprint area; and** • **Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed disturbance footprint area**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	The impact will last between 1 and 5 years	Short term	The impact will last between 1 and 5 years
Extent	Limited	Limited to the site and its immediate surroundings	Limited	Limited to the site and its immediate surroundings
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	Probable	The impact has occurred here or elsewhere and could therefore occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	Medium	The affected environment will only recover from the impact with significant intervention
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Minor - negative**		**Negligible - negative**	

Comment on significance	Wetland habitats are protected under NWA and therefore remains of high ecological importance and should be avoided in all phases of development however impact on SCC is low to negligible
Cumulative impacts	No current developments in the vicinity therefore the cumulative impact is negligible.

Ref:	Watercourse	9		
Project phase	**Construction**			
Impact	**Watercourse-** • **Vegetation clearing, loss of potential SCC habitat; and** • **Spread of AIPs**			
Description of impact	The spread of AIPs can lead the potential loss of floral species diversity from surrounding natural habitat. Further loss in floral communities due to vegetation clearing can contribute to the loss in SCC habitat.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	• **Impact limited to the minimal footprint area; and** • **Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed disturbance footprint area**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	The impact will last between 1 and 5 years	Short term	The impact will last between 1 and 5 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Very low	Natural and/ or social functions and/ or processes are slightly altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Negligible - negative**		**Negligible - negative**	
Comment on significance	Wetland habitats are protected under NWA and therefore remains of high ecological importance and should be avoided in all phases of development however impact on SCC is low to negligible			
Cumulative impacts	No current developments in the vicinity therefore the cumulative impact is negligible.			

Ref:	Low Growing Shrubland	10
Project phase	**Operation**	
Impact	**Low Growing Shrubland-** • **Regular vegetation clearing removing possible SCC habitat; and**	

	• **Loss of available habitat for SCC due to AIP proliferation and potential harvesting.**			
Description of impact	Regular vegetation clearing decrease natural floral communities thereby limiting potential sites for SCC. Furthermore, the increase in degraded sites can potentially result in higher AIP proliferation thereby further limiting potential SCC. However, due to low POC of SCC the expected impact is minimal.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	• **Regular monitoring of SCC present and observation regarding their extent and abundance;** • **Proper management plans to (if possible) relocated or avoid disturbing SCC species, especially those which are sensitive to disturbance; and** • **The proposed project should thus manage disturbances and AIPs along the entire extent as well as within a 15 m buffer (Environmental buffer) surrounding the road. This will decrease the potential for AIPs to become a significant threat to indigenous flora and to SCCs.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Local	Extending across the site and to nearby settlements	Very limited	Limited to specific isolated parts of the site
Intensity	Very low	Natural and/ or social functions and/ or processes are slightly altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Likely	The impact may occur	Probable	The impact has occurred here or elsewhere and could therefore occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Negligible - negative**	
Comment on significance	The presence an POC of SCC is low within this Sub-Unit and therefore impact should be minimal. If monitoring of AIPs is effective this could limit the spread of AIPs within this habitat unit.			
Cumulative impacts	No current developments in the vicinity therefore the cumulative impact is negligible.			

Ref:	Scattered Bush Clumps	11

Project phase	**Operation**	
Impact	**Scattered Bush Clumps-** • **Regular vegetation clearing removing possible SCC habitat; and** • **Loss of available habitat for SCC due to AIP proliferation and potential harvesting.**	
Description of impact	Regular vegetation clearing decrease natural floral communities thereby limiting potential sites for SCC. Furthermore, the increase in degraded sites can potentially result in higher AIP proliferation thereby further limiting potential SCC. The decrease in SCC habitat can possibility impact SCC abundance since this Sub-Unit has a medium POC of SCC.	
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts
Potential mitigation	• **Regular monitoring of SCC present and observation regarding their extent and abundance;**	

	• **Proper management plans to (if possible) relocated or avoid disturbing SCC species, especially those which are sensitive to disturbance; and** • **The proposed project should thus manage disturbances and AIPs along the entire extent as well as within a 15 m buffer (Environmental buffer) surrounding the road. This will decrease the potential for AIPs to become a significant threat to indigenous flora and to SCCs..**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Limited	Limited to the site and its immediate surroundings	Limited	Limited to the site and its immediate surroundings
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Likely	The impact may occur	Likely	The impact may occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	The presence an POC of SCC is medium within this Sub-Unit and therefore impact of operation and maintenance activities can influence SCC abundance and stability however with proper management of AIP and mitigation towards impacting SCC the impacts can be decreased.			
Cumulative impacts	No current developments in the vicinity therefore the cumulative impact is negligible.			

Ref:	Tree Dominated Shrublands	12
Project phase	**Operation**	
Impact	**Tree Dominated Shrublands-** • **Regular vegetation clearing removing possible SCC habitat; and** • **Loss of available habitat for SCC due to AIP proliferation and potential harvesting.**	
Description of impact	Regular vegetation clearing decrease natural floral communities thereby limiting potential sites for SCC. Furthermore, the increase in degraded sites can potentially result in higher AIP proliferation thereby further limiting potential SCC.	
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts
Potential mitigation	• **Regular monitoring of SCC present and observation regarding their extent and abundance;** • **Proper management plans to (if possible) relocated or avoid disturbing SCC species, especially those which are sensitive to disturbance; and** • **The proposed project should thus manage disturbances and AIPs along the entire extent as well as within a 15 m buffer (Environmental buffer) surrounding the road. This will decrease the potential for AIPs to become a significant threat to indigenous flora and to SCCs.**	
Assessment	**Without mitigation**	**With mitigation**
Nature	Negative	Negative
Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site

Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Negligible - negative**	
Comment on significance	This Sub-Unit has a high probability of supporting one protected species, therefore the impact of regular vegetation clearing, and AIP proliferation can impact SCC abundance and community stability. However, with adherence to mitigation suggestions the impact can be minimal.			
Cumulative impacts	No current developments in the vicinity therefore the cumulative impact is negligible.			

Ref:	Sundays Valley Thicket	13

Project phase	**Operation**			
Impact	**Sunday Valley Thicket –** • **Regular vegetation clearing destroying SCC and SCC habitat; and** • **Loss of available habitat for SCC due to AIP proliferation and potential harvesting.**			
Description of impact	Increased human presence in the area once operational, potentially leading to Illegal harvesting/ collection of floral SCC impacting on floral communities outside of the development footprint. Loss of floral SCC through ineffective monitoring of relocation success of rescued and relocated floral SCC (where applicable). Furthermore, movement along linear development or alongside roads are often sources of AIP distributions and infestations. The overabundance of AIPs can change the natural conditions of favourable habitat sites which currently sustain SCC and decrease available habitat for natural occurring SCC. On-going disturbance during the operational phase may lead to erosion and sedimentation of surrounding favourable habitat for SCCs.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	• **Regular monitoring of SCC present and observation regarding their extent and abundance;** • **Proper management plans to (if possible) relocated or avoid disturbing SCC species, especially those which are sensitive to disturbance; and** • **The proposed project should thus manage disturbances and AIPs along the entire extent as well as within a 15 m buffer (Environmental buffer) surrounding the road. This will decrease the potential for AIPs to become a significant threat to indigenous flora and to SCCs.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Local	Extending across the site and to nearby settlements	Local	Extending across the site and to nearby settlements
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered

Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	High	The resource is irreparably damaged and is not represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Moderate - negative**		**Minor - negative**	
Comment on significance	This Sub-Unit had a high abundance of SCC , endangered and RDL species, therefore, without implementation of mitigation measures the impact can be severe. However, with continues and dedicated adherence to provincial and suggested mitigation measure the impact can be minimised, but this is suggested as a long term protection and monitoring plan.			
Cumulative impacts	Within the nearby vicinity there are wind farm construction activities taking place the increase in access and movement within site increases opportunity for illegal harvesting and destruction of SCC is a potential cumulative impact. Furthermore, the additional movement can increase probability of AIP proliferation removing natural habitat for SCC.			

Ref:	Calcareous Grasslands	14

Project phase	**Operation**			
Impact	**Calcareous Grasslands-** • **Regular vegetation clearing removing possible SCC habitat; and** • **Loss of available habitat for SCC due to AIP proliferation and potential harvesting.**			
Description of impact	Regular vegetation clearing decrease natural floral communities thereby limiting potential sites for SCC. Furthermore, the increase in degraded sites can potentially result in higher AIP proliferation thereby further limiting potential SCC.			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	• **Regular monitoring of SCC present and observation regarding their extent and abundance;** • **Proper management plans to (if possible) relocated or avoid disturbing SCC species, especially those which are sensitive to disturbance; and** • **The proposed project should thus manage disturbances and AIPs along the entire extent as well as within a 15 m buffer (Environmental buffer) surrounding the road. This will decrease the potential for AIPs to become a significant threat to indigenous flora and to SCCs.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Likely	The impact may occur	Probable	The impact has occurred here or elsewhere and could therefore occur

Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Minor - negative**		**Negligible - negative**	
Comment on significance	The POC for Sensitive Species are low-medium and the high risk of AIP introduction could impact the available resources and habitat units for these species. However, with proper precautions and monitoring the influence of the OHPL powerline should be minimal.			
Cumulative impacts	Within the nearby vicinity there are wind farm construction activities taking place the increase in access and movement within sites increases potential for soil erosion processes limiting SCC habitat. Furthermore, the additional movement can increase probability of AIP proliferation removing natural habitat for SCC.			

Ref:	Thicket Patches	15

Project phase	**Operation**			
Impact	**Thicket Patches-** • **Regular vegetation clearing; and** • **Loss of available habitat for SCC due to AIP proliferation and potential harvesting.**			
Description of impact	Increased human presence in the area once operational, potentially leading to Illegal harvesting/ collection of floral SCC impacting on floral communities outside of the development footprint. Loss of floral SCC through ineffective monitoring of relocation success of rescued and relocated floral SCC (where applicable). Furthermore, movement along linear development or alongside roads are often sources of AIP distributions and infestations. The overabundance of AIPs can change the natural conditions of favourable habitat sites which currently sustain SCC and decrease available habitat for natural occurring SCC. On-going disturbance during the operational phase may lead to erosion and sedimentation of surrounding favourable habitat for SCCs.			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	• **Regular monitoring of SCC present and observation regarding their extent and abundance;** • **Proper management plans to (if possible) relocated or avoid disturbing SCC species, especially those which are sensitive to disturbance; and** • **The proposed project should thus manage disturbances and AIPs along the entire extent as well as within a 15 m buffer (Environmental buffer) surrounding the road. This will decrease the potential for AIPs to become a significant threat to indigenous flora and to SCCs.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Local	Extending across the site and to nearby settlements	Limited	Limited to the site and its immediate surroundings
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Almost certain / Highly probable	It is most likely that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment

Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	Medium	The affected environment will only recover from the impact with significant intervention
Resource irreplaceability	High	The resource is irreparably damaged and is not represented elsewhere	High	The resource is irreparably damaged and is not represented elsewhere
Significance	**Moderate - negative**		**Minor - negative**	
Comment on significance	AIPs are currently present within this habitat unit and could become extensive without proper intervention removing available SCC habitat. The loss of SCC within this Sub-Unit is of concern considering regular vegetation clearing takes place. Therefore, proper demarcation of SCC within this Sub-Unit is necessary to avoid disturbance and loss of SCC. If proper management and mitigation protocols are in place the impacts of operations on SCC can be decreased.			
Cumulative impacts	Within the nearby vicinity there are wind farm construction activities taking place the increase in access and movement within site increases opportunity for illegal harvesting and destruction of SCC is a potential cumulative impact. Furthermore, the additional movement can increase probability of AIP proliferation removing natural habitat for SCC.			

Ref:	Transformed Areas	16

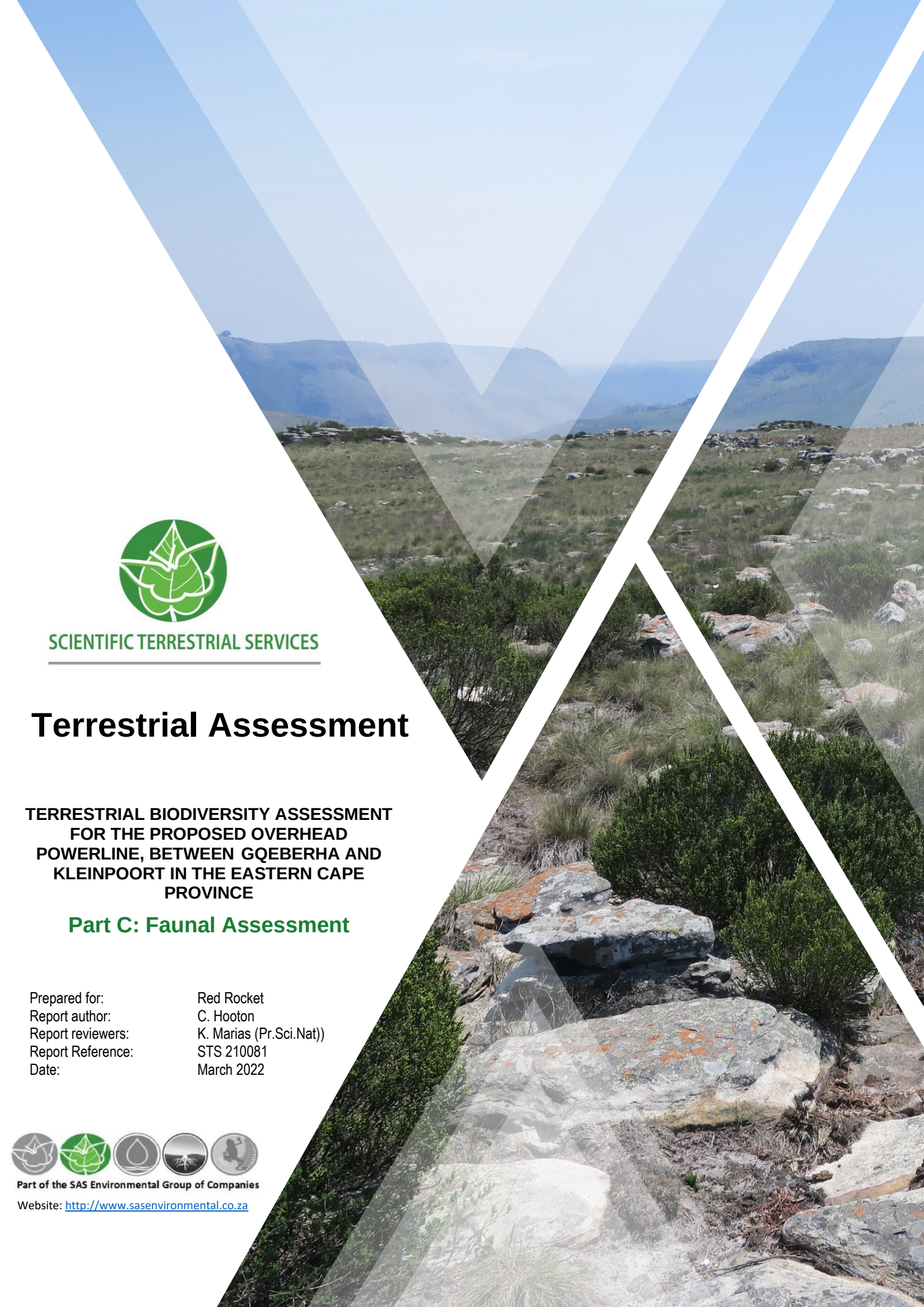
Project phase	**Operation**			
Impact	**Transformed Areas-** • **Regular vegetation clearing removing possible SCC habitat; and** • **Loss of available habitat for SCC due to AIP proliferation and potential harvesting.**			
Description of impact	Regular vegetation clearing decrease natural floral communities thereby limiting potential sites for SCC. Furthermore, the increase in degraded sites can potentially result in higher IP proliferation thereby further limiting potential SCC. However, the POC for SCC are negligible within this Sub-Unit therefore impacts on SCC should be minimal.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	• **Proper management plans to (if possible) relocated or avoid disturbing SCC species, especially those which are sensitive to disturbance; and** • **The proposed project should thus manage disturbances and AIPs along the entire extent as well as within a 15 m buffer (Environmental buffer) surrounding the road. This will decrease the potential for AIPs to become a significant threat to indigenous flora and to SCCs.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Very low	Natural and/ or social functions and/ or processes are slightly altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment

Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Negligible - negative**		**Negligible - negative**	
Comment on significance	This area is of low floristic and/or ecological importance (i.e. sensitivity), monitoring of AIP abundance could be beneficial to advise against possible spread into surrounding habitat units. Low POC for SCC therefore the impact should be negligible			
Cumulative impacts	This Sub-unit has a negligible to low POC for SCC therefore even the cumulative impact should be negligible			

Ref:	Other Drainage Features habitat	17		
Project phase	**Operation**			
Impact	**Other Drainage Features-** • **Regular vegetation clearing removing possible SCC habitat; and** • **Loss of available habitat for SCC due to AIP proliferation and potential harvesting.**			
Description of impact	Regular vegetation clearing decrease natural floral communities thereby limiting potential sites for SCC. Furthermore, the increase in degraded sites can potentially result in higher AIP proliferation thereby further limiting potential SCC. However, the POC for SCC are negligible within this Sub-Unit therefore impacts on SCC should be minimal.			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	• **Proper management plans to (if possible) relocated or avoid disturbing SCC species, especially those which are sensitive to disturbance; and** • **The proposed project should thus manage disturbances and AIPs along the entire extent as well as within a 15 m buffer (Environmental buffer) surrounding the road. This will decrease the potential for AIPs to become a significant threat to indigenous flora and to SCCs.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Local	Extending across the site and to nearby settlements	Limited	Limited to the site and its immediate surroundings
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Medium	The affected environment will only recover from the impact with significant intervention	Medium	The affected environment will only recover from the impact with significant intervention
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Negligible - negative**		**Negligible - negative**	

Comment on significance	These sites are important for ecological functioning yet floristically this Sub-Unit is not important for the suitability or probability of SCC to occur and therefore the impact should be minimal
Cumulative impacts	These sites are important for ecological functioning yet floristically this Sub-Unit is not important for the suitability or probability of SCC to occur and therefore the impact should be minimal

Ref:	Watercourse	18		
Project phase	**Operation**			
Impact	**Watercourse-** • **Regular vegetation clearing removing possible SCC habitat; and** • **Loss of available habitat for SCC due to AIP proliferation and potential harvesting.**			
Description of impact	Regular vegetation clearing decrease natural floral communities thereby limiting potential sites for SCC. Furthermore, the increase in degraded sites can potentially result in higher IP proliferation thereby further limiting potential SCC. However, the POC for SCC are negligible within this Sub-Unit therefore impacts on SCC should be minimal.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	• **Proper management plans to (if possible) relocated or avoid disturbing SCC species, especially those which are sensitive to disturbance; and** • **The proposed project should thus manage disturbances and AIPs along the entire extent as well as within a 15 m buffer (Environmental buffer) surrounding the road. This will decrease the potential for AIPs to become a significant threat to indigenous flora and to SCCs.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Long term	Impact will last between 10 and 15 years	Long term	Impact will last between 10 and 15 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Low	The affected environment will not be able to recover from the impact - permanently modified	Medium	The affected environment will only recover from the impact with significant intervention
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Negligible - negative**	
Comment on significance	The impact of AIP on the suitability and presence of SCC within this Sub-Unit should be minimal as the POC For SCC is low			
Cumulative impacts	No current developments in the vicinity therefore the cumulative impact is negligible.			



SCIENTIFIC TERRESTRIAL SERVICES

Terrestrial Assessment

TERRESTRIAL BIODIVERSITY ASSESSMENT FOR THE PROPOSED OVERHEAD POWERLINE, BETWEEN GQEBERHA AND KLEINPOORT IN THE EASTERN CAPE PROVINCE

Part C: Faunal Assessment

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Report Reference:	STS 210081
Date:	March 2022

Part of the SAS Environmental Group of Companies

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DOCUMENT GUIDE

The table below provides a guide to the reporting of biodiversity impacts as they relate to 1) Government Notice No. 320 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on **Terrestrial Biodiversity** as published in Government Gazette 43110 dated 20 March 2020, and 2) Government Notice No. 1150 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on **Terrestrial Plant and Animal Species** as published in Government Gazette 43855 dated 30 October 2020.

No.	SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS	Section in report/Notes
Theme-Specific Requirements as per Government Notice No. 320 Terrestrial Biodiversity Theme – Very High Sensitivity Rating as per Screening Tool Output		
2	**Terrestrial Biodiversity Specialist Assessment**	
2.1	The assessment must be prepared by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with expertise in the field of terrestrial biodiversity.	**Part A – C:** Cover Page **Part A:** Appendix E
2.2	The assessment must be undertaken on the preferred site and within the proposed development footprint.	**Part A**: Section 1
2.3	**The assessment must provide a baseline description of the site which includes, as a minimum, the following aspects:**	
2.3.1	A description of the ecological drivers or processes of the system and how the proposed development will impact these;	**Part B**: Section 3 (flora) **Part C:** Section 3 (fauna)
2.3.2	Ecological functioning and ecological processes (e.g., fire, migration, pollination, etc.) that operate within the preferred site;	**Part B**: Section 3 (flora) **Part C:** Section 3 (fauna)
2.3.3	The ecological corridors that the proposed development would impede including migration and movement of flora and fauna;	**Part A:** Section 3 (desktop analysis) **Part B**: Section 3 (flora) **Part C:** Section 3 (fauna)
2.3.4	The description of any significant terrestrial landscape features (including rare or important flora-faunal associations, presence of Strategic Water Source Areas (SWSAs) or Freshwater Ecosystem Priority Area (FEPA) sub catchments;	**Part A:** Section 3 (desktop analysis) **Part B:** Section 3.2 – 3.3 (flora) **Part C:** Section 3.2 – 3.5 (fauna) **For descriptions on the presence of FEPAs, please refer to the Freshwater Biodiversity Assessment (SAS 202196, 2021*
2.3.5	A description of terrestrial biodiversity and ecosystems on the preferred site, including: a) main vegetation types; b) threatened ecosystems, including listed ecosystems as well as locally important habitat types identified; c) ecological connectivity, habitat fragmentation, ecological processes and fine scale habitats; and d) species, distribution, important habitats (e.g. feeding grounds, nesting sites, etc.) and movement patterns identified;	**Part A**: Section 3 (desktop analysis) **Part B**: Section 3 (flora) **Part C:** Section 3 (fauna)
2.3.6	The assessment must identify any alternative development footprints within the preferred site which would be of a "low" sensitivity as identified by the screening tool and verified through the site sensitivity verification; and	Not Applicable.
2.3.7	**The assessment must be based on the results of a site inspection undertaken on the preferred site and must identify:**	
2.3.7.1	Terrestrial Critical Biodiversity Areas (CBAs), including: *a) the reasons why an area has been identified as a CBA;*	**Part A**: Section 3 (desktop analysis)

No.	SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS	Section in report/Notes
	b) an indication of whether or not the proposed development is consistent with maintaining the CBA in a natural or near natural state or in achieving the goal of rehabilitation; *c) the impact on species composition and structure of vegetation with an indication of the extent of clearing activities in proportion to the remaining extent of the ecosystem type(s);* *d) the impact on ecosystem threat status;* *e) the impact on explicit subtypes in the vegetation;* *f) the impact on overall species and ecosystem diversity of the site; and* g) *the impact on any changes to threat status of populations of species of conservation concern in the CBA;*	**Part B**: Section 3.2, 5.2.3 **Part C:** Section 3, 4 & 5
2.3.7.2	Terrestrial Ecological Support Areas (ESAs), including: *a) the impact on the ecological processes that operate within or across the site;* *b) the extent the proposed development will impact on the functionality of the ESA; and* c) *loss of ecological connectivity (on site, and in relation to the broader landscape) due to the degradation and severing of ecological corridors or introducing barriers that impede migration and movement of flora and fauna;*	
2.3.7.3	Protected areas as defined by the National Environmental Management: Protected Areas Act, 2004 including- *a) an opinion on whether the proposed development aligns with the objectives or purpose of the protected area and the zoning as per the protected area management plan;*	**Part A**: Section 3 (desktop analysis) However, not applicable as no protected areas or areas of conservation concern are within 10 km of the proposed project,
2.3.7.4	Priority areas for protected area expansion, including- *a) the way in which in which the proposed development will compromise or contribute to the expansion of the protected area network;*	**Part A**: Section 3 (desktop analysis)
2.3.7.5	SWSAs including: *a) the impact(s) on the terrestrial habitat of a SWSA; and* b) *the impacts of the proposed development on the SWSA water quality and quantity (e.g. describing potential increased runoff leading to increased sediment load in water courses);*	Not Applicable to this report
2.3.7.6	FEPA sub catchments, including- *a) the impacts of the proposed development on habitat condition and species in the FEPA sub catchment;*	Not Applicable to this report
2.3.7.7	Indigenous forests, including: *a) impact on the ecological integrity of the forest; and* b) *percentage of natural or near natural indigenous forest area lost and a statement on the implications in relation to the remaining areas.*	Not Applicable to this report
2.4	**The findings of the assessment must be written up in a Terrestrial Biodiversity Specialist Assessment Report.**	
	Part B: Results of the **Floral Assessment** as well as conclusions on Terrestrial Biodiversity as it relates to vegetation communities. **Part C:** Results of the **Faunal Assessment** as well as conclusions on Terrestrial Biodiversity as it relates to faunal communities.	
3	**Terrestrial Biodiversity Specialist Assessment Report**	
3.1	**The Terrestrial Biodiversity Specialist Assessment Report must contain, as a minimum, the following information:**	
3.1.1	Contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	**Part A:** Appendix E
3.1.2	A signed statement of independence by the specialist;	**Part A:** Appendix E
3.1.3	A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	**Part B:** Section 1.3 (flora) **Part C:** Section 1.3 (fauna)

No.	SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS	Section in report/Notes
3.1.4	A description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modelling used, where relevant;	**Part A**: Appendix C **Part B:** Section 2 (flora) **Part B:** Appendix A (flora) **Part C:** Section 2 (fauna) **Part C**: Appendix A (fauna)
3.1.5	A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;	**Part B:** Section 1.3 (flora) **Part C:** Section 1.3 (fauna)
3.1.6	A location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant);	**Part B:** Section 4 (flora) **Part C:** Section 4 (fauna)
	Impact Assessment Requirements 3.1.7 Additional environmental impacts expected from the proposed development; 3.1.8 Any direct, indirect and cumulative impacts of the proposed development; 3.1.9 The degree to which impacts and risks can be mitigated; 3.1.10 The degree to which the impacts and risks can be reversed; 3.1.11 The degree to which the impacts and risks can cause loss of irreplaceable resources; 3.1.12 Proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	**Part B:** Section 5 (flora) **Part C:** Section 5 (fauna)
3.1.13	A motivation must be provided if there were development footprints identified as per paragraph 2.3.6 above that were identified as having a "low" terrestrial biodiversity sensitivity and that were not considered appropriate;	**Not Applicable to this report**
3.1.14	A substantiated statement, based on the findings of the specialist assessment, regarding the acceptability, or not, of the proposed development, if it should receive approval or not; and	**Part A:** Executive summary **Part B:** Section 6 (flora) **Part C:** Section 6 (fauna)
3.1.15	Any conditions to which this statement is subjected.	**Part B:** Section 5.1 (flora) **Part C:** Section 5.1 (fauna)
3.2	The findings of the Terrestrial Biodiversity Specialist Assessment must be incorporated into the Basic Assessment Report or the Environmental Impact Assessment Report, including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr where relevant.	**Not Applicable to this report**
3.3	A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	**Not Applicable to this report**

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ACRONYMS

ADU	The Animal Demography Unit online database: http://vmus.adu.org.za/.
AIP	Alien Invasive Plant
BGIS	Biodiversity Geographic Information Systems
CR	Critically Endangered
DFFE	Department of Forestry, Fisheries and the Environment
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIS	Ecological Importance and Sensitivity
EN	Endangered
EW	Extinct in the Wild
GIS	Geographic Information System
GPS	Global Positioning System
H	High
IBA	Important Bird Area
IEA	Integrated Environmental Authorisation
IEM	Integrated Environmental Management
EMPrs	Environmental Management Programmes
IUCN	International Union for Conservation of Nature and Natural Resources
Km	Kilometers
KMR	Kudumane Manganese Resources (Pty) Ltd
LC	Least Concern
NA	Not Applicable
NL	Not Listed
NT	Near Threatened
NEMBA	National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)
NYBA	Not yet been assessed
m	Meters
M	Medium
MAMSL	Meters Above Mean Sea Level
P	Protected, according to the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004): Amendment of Critically Endangered, Endangered, Vulnerable and Protected Species List. December 2007
PCDs	Pollution Control Dams
PES	Present Ecological State
POC	Probability of Occurrence
PRECIS	Pretoria Computerised Information System
QDS	Quarter Degree Square
RDL	Red Data Listed
RE	Regionally Extinct
SABAP	Southern African Bird Atlas Project
SANBI	South Africa National Biodiversity Institute
SP	Specially Protected
STS	Scientific Terrestrial Services CC
SCC	Species of Conservation Concern
TOPS	Threatened Or Protected Species (list of 2007) according to the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004):
VU	Vulnerable
WML	Waste Management Licence
WRDs	Waste Rock Dumps

GLOSSARY OF TERMS

Alien and Invasive species	A species that is not an indigenous species; or an indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention.
Carrying Capacity	The maximum population size of a biological species that can be sustained by that specific environment, given the food, habitat, water, and other resources available.
CBA (Critical Biodiversity Area)	A CBA is an area considered important for the survival of threatened species and includes valuable ecosystems such as wetlands, untransformed vegetation and ridges.
Corridor (ecological)	Open areas of native vegetation, providing habitat that connects wildlife populations in isolated areas that are separated by human activities or structures. Corridors provide cohesion in otherwise fragmented ecosystems. Through the connection of fragmented habitats, the viability of animal and plant species is improved by enlarging habitats, for example to improve the search for food, dispersion of young animals and re-use of "empty" habitats (Sicirec, 2009)
Diversity	Abundance and species richness of faunal classes
Ecosystem	A community of living organisms in conjunction with the non-living components of their environment, interacting as a system. These biotic and abiotic components are linked together through nutrient cycles and energy flows.
Endangered (according to IUCN)	Organisms at very high risk of extinction in the wild
Endemic species	Species that are only found within a pre-defined area. There can therefore be sub-continental (e.g., southern Africa), national (South Africa), provincial, regional or even within a particular mountain range.
Ephemeral (River)	A stream or river that only exists for a short period following precipitation.
Equilibrium (in ecology)	Synonymous with “ecological balance”, this term has been defined by various online dictionaries as "a state of dynamic equilibrium within a community of organisms in which genetic, species and ecosystem diversity remain relatively stable, subject to gradual changes through natural succession”
ESA (Ecological Support Area)	An ESA provides connectivity and important ecological processes between CBAs and is therefore important in terms of habitat conservation.
Faunal Class	In biological classification, class (Latin: classis) is a taxonomic rank, as well as a taxonomic unit. Class specifically refers to major groups, namely: mammals, avifauna (birds), reptiles and invertebrates.
Habitat Integrity (ecological)	The integrity of an ecosystem refers to its functional completeness, including its components (species) its patterns (distribution) and its processes.
Least Concern	Unlikely to become extinct in the near future. A least-concern species is a species that has been categorized by the International Union for Conservation of Nature (IUCN) as evaluated as not being a focus of species conservation. They do not qualify as threatened, near threatened, or (before 2001) conservation dependent.
Least Threatened	Least threatened ecosystems are still largely intact.
Near Threatened (according to IUCN)	Close to being at high risk of extinction in the near future.
Protected	Species of high conservation value or national importance that require protection, according to NEMBA: TOPS 2007 species list
Refugia (ecological)	Refugium (plural: refugia) is a location which supports an isolated or relict population of a once more widespread species. This isolation can be caused by climatic changes, geography, or human activities such as deforestation and overhunting.
Resource (ecological)	In biology and ecology, a resource is a substance or object in the environment required by an organism for normal growth, maintenance, and reproduction.
RDL (Red Data listed) species	Organisms that fall into the Extinct in the Wild (EW), critically endangered (CR), Endangered (EN), Vulnerable (VU) categories of ecological status.
Rupicolous	Living or growing on or among rocks
Sourveld	African veld that is largely covered with coarse seasonal perennial grasses and affords inferior grazing.

SCC (Species of Conservation Concern)	The term SCC in the context of this report refers to all RDL (Red Data) and IUCN (International Union for the Conservation of Nature) listed threatened species as well as protected species of relevance to the project.
Sporadic/Sporadically	Occurring at irregular intervals or only in a few places; scattered or isolated.
Sweetveld	(In South Africa) a type of grazing characterized by high-quality grass for grazing.
Termitaria	Termite colonies, typically within a tall mound of cemented earth.
Vulnerable (according to IUCN)	Species meets one of the 5 red list criteria and thus considered to be at high risk of unnatural (human-caused) extinction without further human intervention.

1 INTRODUCTION

1.1 Background

Scientific Terrestrial Services CC (STS) was appointed by Red Rocket (Pty) Ltd to conduct a terrestrial biodiversity assessment as part of the Environmental Authorisation (EA) process for the proposed overhead powerline (OHPL), between Qqeberha and Kleinpoort, from Grassridge Substation to the Wolf Substation in the Eastern Cape Province.

The total extent of the proposed OHPL is ±181 kilometers (km). The OHPL is connected to three (3) existing substations, namely the Wolf substation in the western end, the Grassridge Substation at the eastern end and the Skilpad substation approximately in the mid-section of the proposed OHPL route. A 100 m buffer (50 metres on either side of the proposed OPHL) to account for edge effects was investigated by the specialists. The proposed OPHL and 100 m buffer will henceforth be collectively referred to as the “investigation area”. The extent and layouts of the investigation area is depicted in Figure 1 below.

1.2 Scope of Work

The purpose of this report is to define the faunal ecology of the investigation area as well as mapping and defining areas of increased Ecological Importance and Sensitivity (EIS) and to define the Present Ecological State (PES) of the investigation area. The scope of work for this study is:

- To provide inventories of faunal species as encountered within the areas associated with the investigation area only and does not include an assessment of adjacent properties;
- To determine and describe habitat types, faunal communities and the ecological state of the sites associated with the investigation area and to rank each habitat type based on conservation importance and ecological sensitivity;
- To identify and consider all sensitive landscapes including rocky ridges, wetlands and/ or any other special features;
- To conduct a Red Data Listed (RDL) and Species of Conservation Concern (SCC) assessment, including species as listed in the National Environmental Management: Biodiversity Act, 2004 (Act No.10 of 2004) (NEMBA) Threatened or Protected Species (TOPS) list (Government Notice R152 in Government Gazette 29657, dated 23 February 2007, as amended), and the overall potential for such species to occur within the areas associated with the investigation area.

- To provide detailed information as well as relevant mitigation measures that must be implemented to guide the proposed development activities associated with the investigation area; and
- To ensure the ongoing functioning of the ecosystem in such a way as to support local and regional conservation requirements and the provision of ecological services in the local area.

1.3 Assumptions and Limitations

The following assumptions and limitations are applicable to this report:

- The faunal assessment is confined to the investigation area and does not include the neighbouring and adjacent properties, These were however considered as part of the desktop assessment;
- With ecology being dynamic and complex, some aspects (some of which may be important) may have been overlooked. It is, however, expected that most faunal communities have been accurately assessed and as such the information provided herein is considered sufficient to allow informed decision making to take place and facilitate integrated environmental management;
- As part of the assessment, a field investigation was undertaken during summer (7th – 11th of February and 22nd – 23rd March 2022) to determine the ecological status of the investigation area and to “ground-truth” the results of the desktop assessment (as presented in Part A). A more accurate assessment would require that assessments take place in all seasons of the year. However, on-site data was significantly augmented with all available desktop data, previous specialist studies undertaken by the mine and specialist experience in the area. The findings of this assessment are considered to be an accurate reflection of the ecological characteristics associated with the locality of the investigation area; and
- Due to the nature of sampling and the secretive habits of most faunal taxa, it is unlikely that all species would have been observed during a field assessment of limited duration. Some species and taxa within the footprint area may therefore have been missed during the assessment. Thus, for a more accurate and complete data collection, repeated seasonal assessments are considered more reliable. To limit these seasonal and time constraints, site observations were compared with desktop literature and previous specialist studies undertaken in the area where necessary.

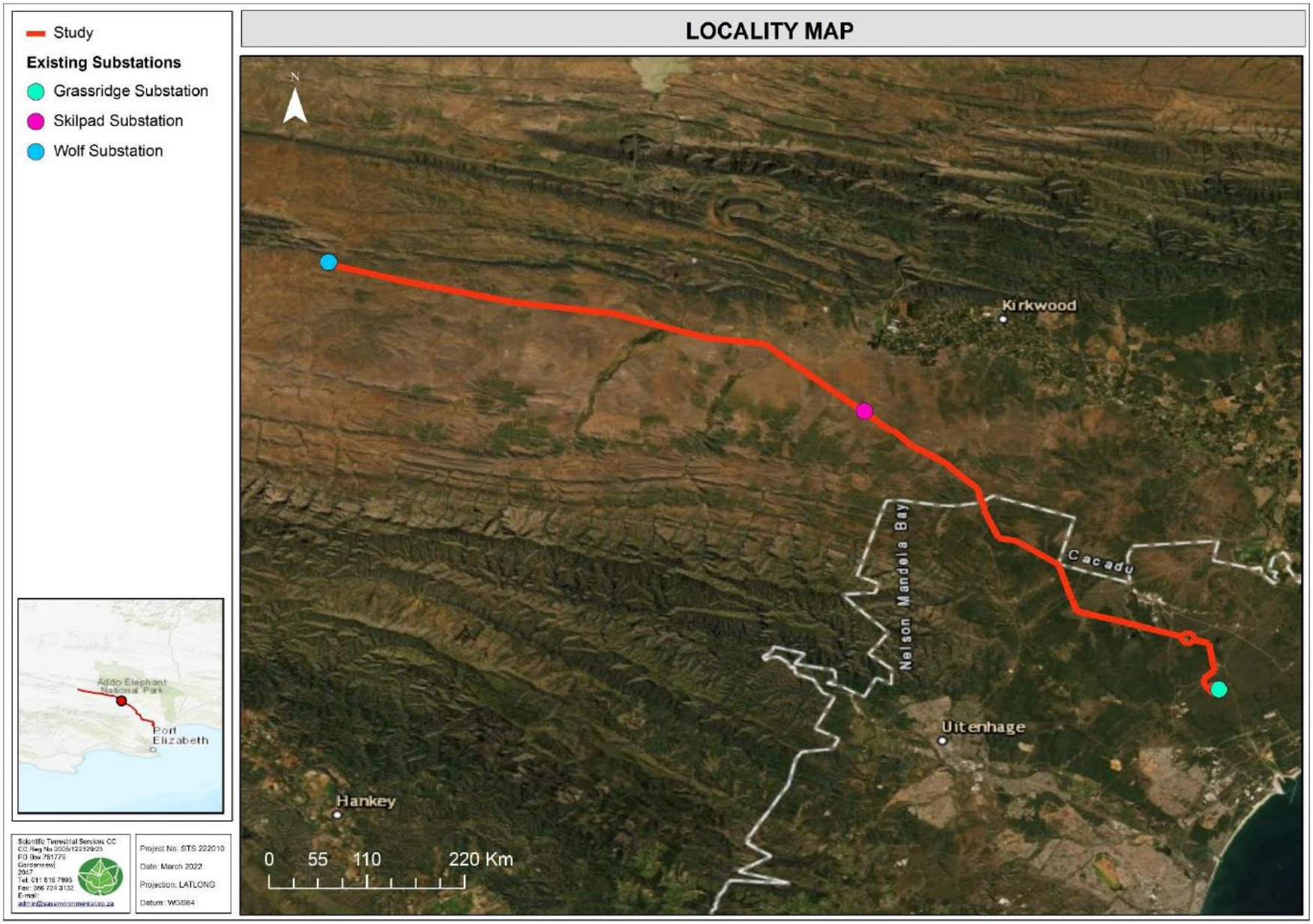


Figure 1: Overview of the investigation area (comprising the proposed OHPL route and 100 m investigation buffer).

2 ASSESSMENT APPROACH

The field assessment was undertaken during summer (7th – 11th of February and 22nd – 23rd March 2022) to determine the faunal ecological status of the investigation area. A reconnaissance 'walkabout' was initially undertaken to determine the general habitat types found throughout the sites where the investigation area will occur. Following this, specific study sites were selected that were considered to be representative of the habitats found within the sites, with special emphasis being placed on areas that may potentially support faunal SCC. Sites were investigated on foot in order to identify the occurrence of fauna within the sites. Sherman and camera traps were used to increase the likelihood of capturing and observing mammal species, notably nocturnal and reclusive mammals.

A detailed explanation of the method of assessment is provided in Appendix A of this report. The faunal categories covered in this assessment are mammals, avifauna, reptiles, amphibians, general invertebrates and arachnids. For the methodologies relating to the impact assessment and development of the mitigation measures, please refer to Appendix C of Part A of the study.

2.1 General approach

In order to accurately determine the PES of the habitat and associated faunal assemblages within the investigation area and capture comprehensive data with respect to faunal taxa, the following methodology was applied:

- Maps and digital satellite images were consulted prior to the field assessment in order to determine broad habitats, vegetation types and potentially sensitive sites. An initial visual on-site assessment of the portions of the investigation area was made in order to confirm the assumptions made during consultation of the digital satellite imagery;
- A literature review with respect to habitats, vegetation types and species distribution was conducted. For a detailed description of the vegetation types and habitats associated with the investigation area, please refer to Part B report;
- Relevant databases considered during the assessment of the investigation area included online atlases on the University of Cape Town (UCT) Animal Demography Unit (ADU) Virtual Museum website; the Important Bird and Biodiversity Areas (IBA, 2015); South African Bird Atlas Project 2 (SABAP2), International Union for Conservation of Nature (IUCN); iNaturalist website; South African National Biodiversity Institute (SANBI) Red List of South African Species; the Northern Cape Biodiversity Areas Database (2016) and the National Biodiversity Assessment (NBA, 2018) (refer to report provided in Part A);

- Specific methodologies for the assessment, in terms of field work and data analysis of faunal ecological assemblages are presented in Appendix A of this report; and
- For the methodologies relating to the impact assessment and development of the mitigation measures, please refer to Appendix C of Part A.

2.2 Sensitivity Mapping

All the ecological features associated with the investigation area were considered, and sensitive areas were assessed. In addition, identified locations of protected species were marked by means of Global Positioning System (GPS). A Geographic Information System (GIS) was used to project these features onto satellite imagery and/or topographic maps. The sensitivity map should guide the final design and layout of the investigation area. Please refer to Section 4 of this report for further details.

2.3 Faunal Species of Conservational Concern Assessment

During field assessments, it is not always feasible to identify or observe all species within an area, largely due to the secretive nature of many faunal species, possible low population numbers or varying habits of species. As such, and to specifically assess an area for faunal SCC, a Probability of Occurrence (POC) estimation is used, considering several factors to determine the probability of faunal SCC occurrence within the sites. Species listed in Appendix B whose known distribution ranges and habitat preferences include the investigation area were taken into consideration. Faunal species likely to occur within the investigation area are indicated and briefly discussed within each of the relevant dashboards, along with their POC.

3 FAUNAL ASSESSMENT RESULTS

3.1 Faunal Habitat

Based on the results of the field investigation conducted during February and March 2022 by STS, five broad habitat units were determined for the investigation area with several sub-units distinguished within the broader habitat units.

These habitat units are discussed briefly below in terms of faunal utilisation and importance and are visually depicted in Figures 2 – 17 below. For a more detailed description and discussion of these habitat units please refer to the Part B: Floral Report.

1) Sundays Arid Thicket habitat, comprising of the subunits *Low Growing Shrubland*, *Scattered Bush Clumps* and the *Tree Dominated Shrublands*. This habitat unit and the sub-units were dominant from the Wolf Substation in the west up to approximately the central portions of the OHPL route. The habitat was notably more arid than the eastern portions of the OHPL, indicative of the vegetation cover and at often times, low abundance of grass cover. Many of the farms in the western and central potion of the OHPL route are under farming practices, either game or livestock (predominantly goats and sheep). Increased levels of grazing were noted on the livestock farms, decreasing habitat integrity and food resources for faunal species. Areas utilised for game farming appeared to have lower grazing intensities and as such, habitat and food provisioning for fauna was higher in these areas. Mammals and insects were more prominent within this habitat unit, however arachnids and reptiles appeared at a notably lower abundance.

Sundays Valley Thicket habitat, became more prominent from the central portions of the OHPL route moving eastwards towards the Grassridge substation. This habitat unit was notably thicker in vegetation structure, with limited openings where herbaceous species can establish. The dense vegetation structure favoured smaller faunal species who select for denser areas, notably plant living invertebrates. Reptiles and arachnids were more evident in this habitat unit, constructing webs between the branches and seeking refuge under the woody plants, fallen logs and sporadic rocky areas. Livestock and game farming are the main land use practices and areas of overgrazing were again evident.

Grassridge Bonteveld, comprising of the *Calcareous Grasslands* and the *Thicket Patches*. This habitat unit is located in the eastern portion of the OHPL route and is interspersed with the Sundays Valley Thicket. The vegetation structure within this habitat unit is of a more open nature, interspersed with thicket patches. The more open vegetation structure combined with the thicket areas provide a more heterogenous habitat structure for fauna, though, the affects of continued grazing was still evident in areas. This habitat unit was often associated with rockier soils and areas of higher elevation. Although grazing material was available, several of the grass species can be considered less palatable, limiting available food material for grazers. Insects, reptile and arachnids were the dominant faunal classes in this habitat, whilst mammal species, whilst present, were at lower levels of abundance.

Transformed Areas, encompassing roads, fence lines, areas transformed by anthropogenic as well as artificial impoundments. Hard surface and cleared areas provided limited habitat for fauna, however the artificial impoundments do serve as a water source (seasonal) for faunal species and amphibians.

Freshwater Habitat, comprising of *Drainage Features (Preferential flow paths)* and *Watercourses (including various river systems, their associated tributaries, ephemeral drainage lines and episodic drainage lines).* The Drainage Features are largely seasonally driven and provide limited to no surface water to fauna. This sub-unit does, however elicit an increased growth of vegetation and as such, provides increased food resources later into the season. The watercourses, although also seasonal, tend to retain water for longer periods of time in areas, notably the rivers and their tributaries. This retention of water provides ideal habitat for water associated and dependant fauna as well as an important seasonal water source in an otherwise fairly dry landscape. Increased vegetation growth also ensures that food resources for herbivorous species are more abundant, whilst many of these smaller herbivores and insects serve as a food resource for predatory species. Furthermore, these freshwater habitats are important as they often serve as corridors for movement, notable for smaller species which require increased levels of shelter and / or moisture in order to avoid predation or desiccation.

Further discussions pertaining to the various faunal assemblages associated with the OHPL route, refer to Section 3.1 – 3.4.

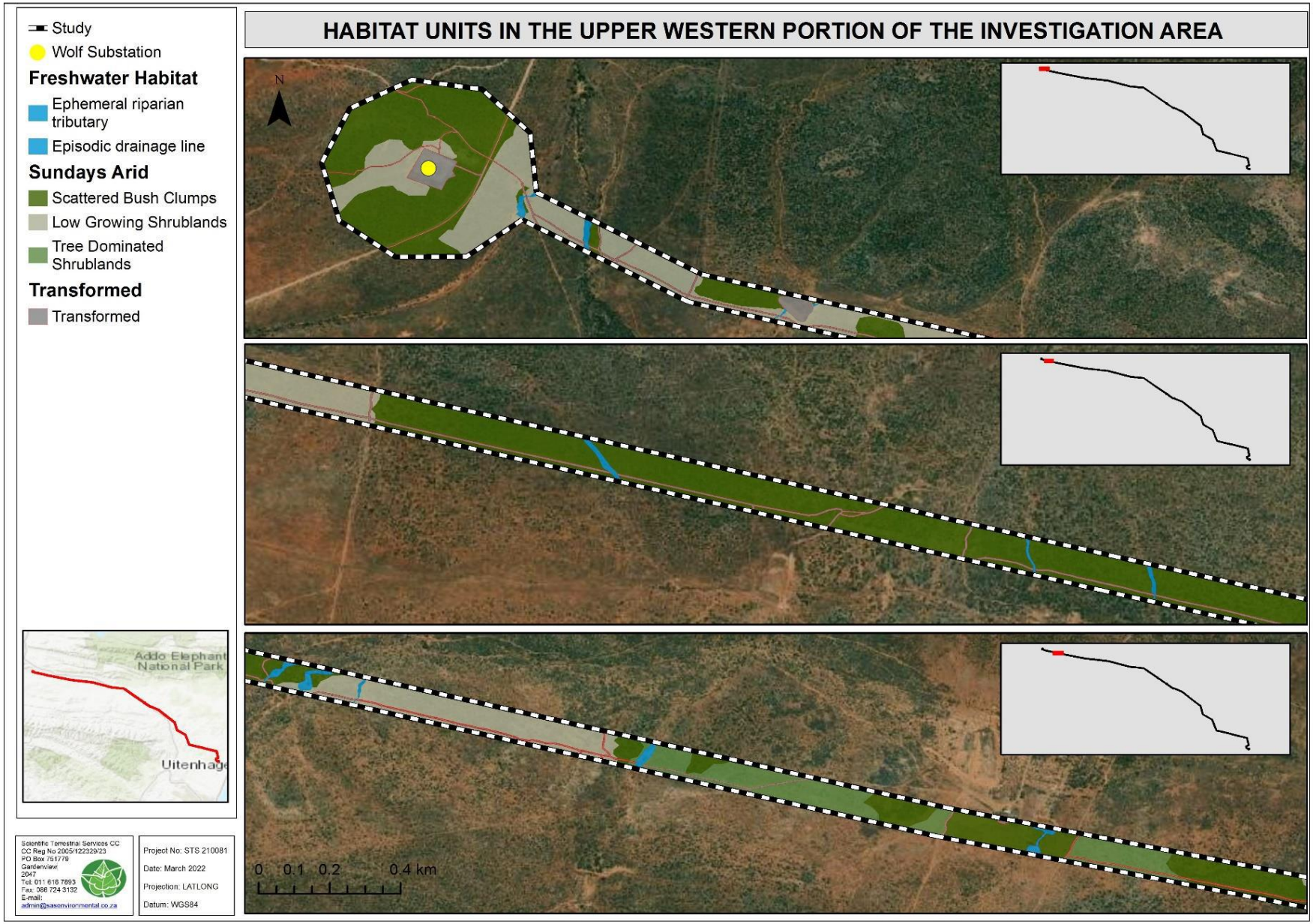


Figure 2: Distribution of habitat units and sub-units located within the upper Western portion of the Investigation Area.

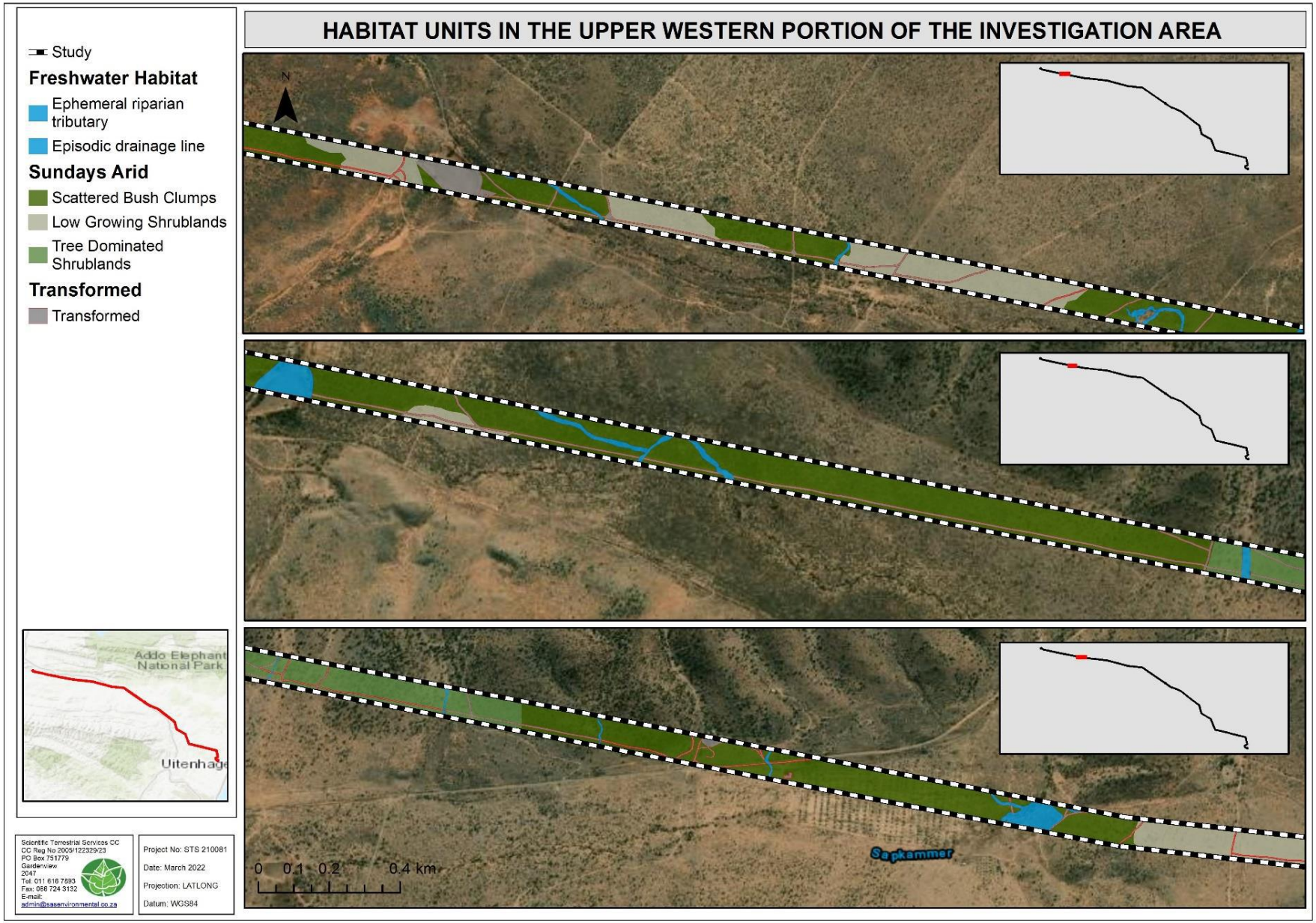


Figure 3: Distribution of the habitat units and sub-units located in the upper Western portion of the Investigation Area.

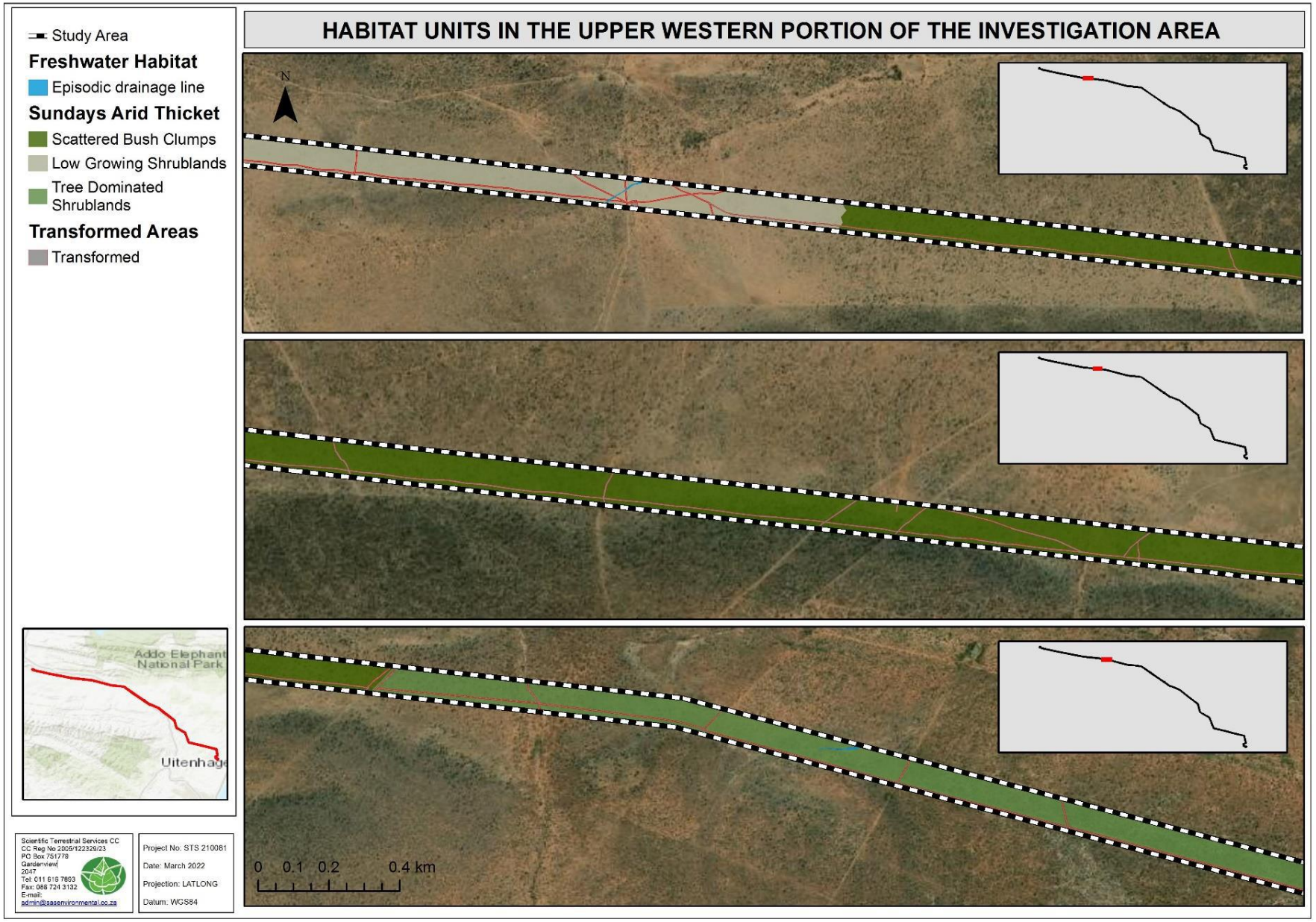


Figure 4: Distribution of the habitat units and sub-units located in the upper Western portion of the Investigation Area.

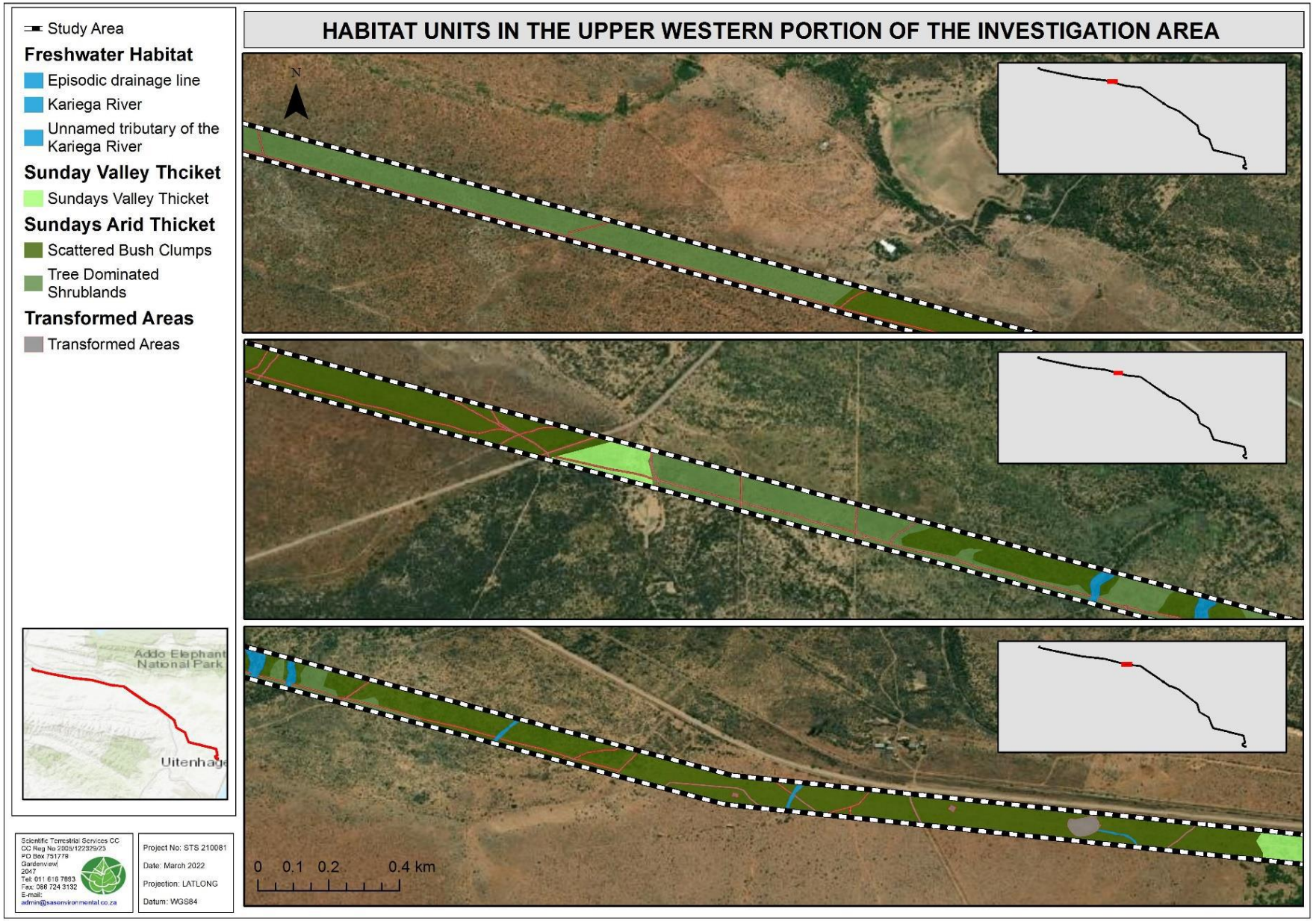


Figure 5: Distribution of the habitat units and sub-units located in the upper Western portion of the Investigation Area.

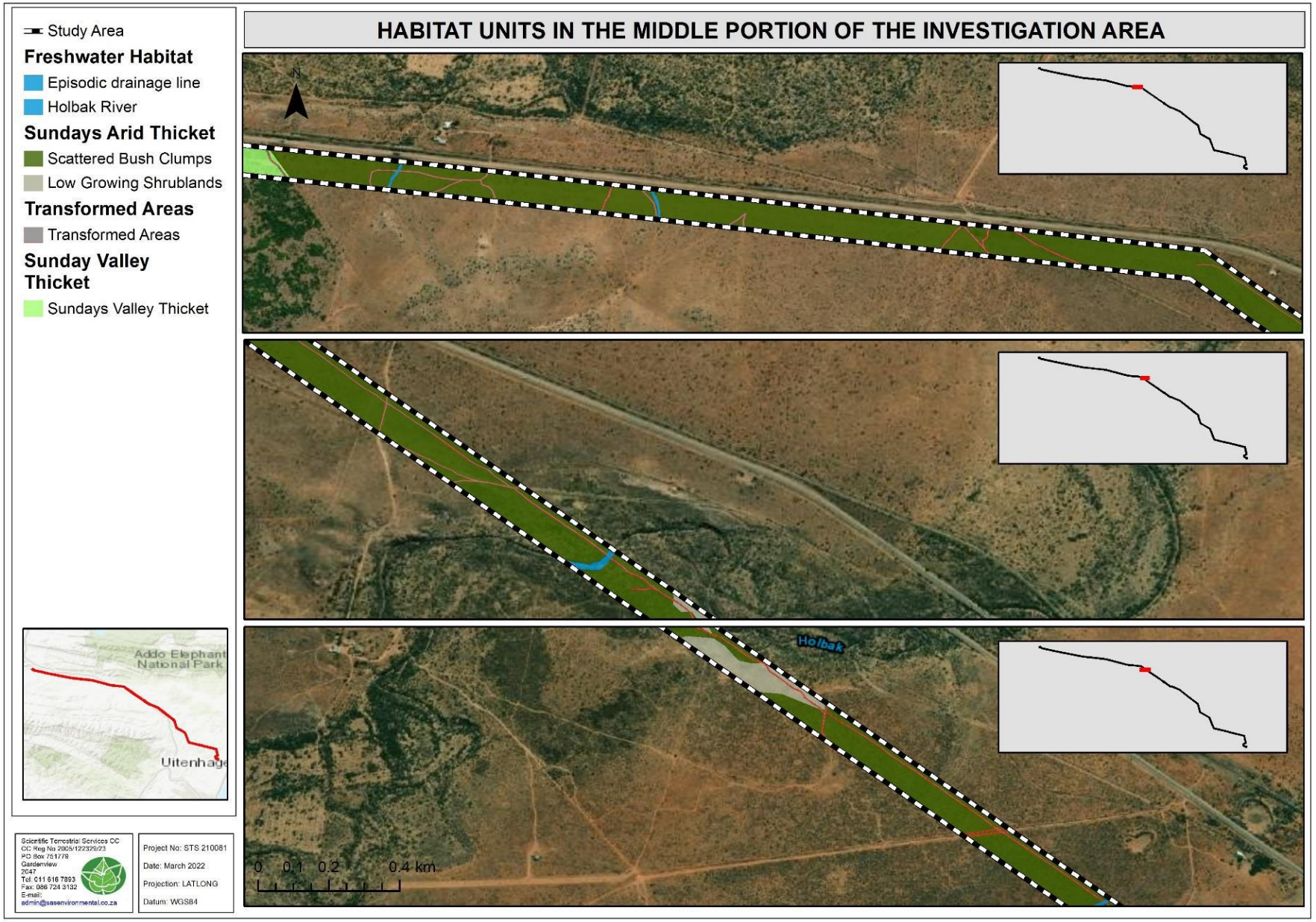


Figure 6: Distribution of the habitat units and sub-units located in the upper Western portion of the Investigation Area.

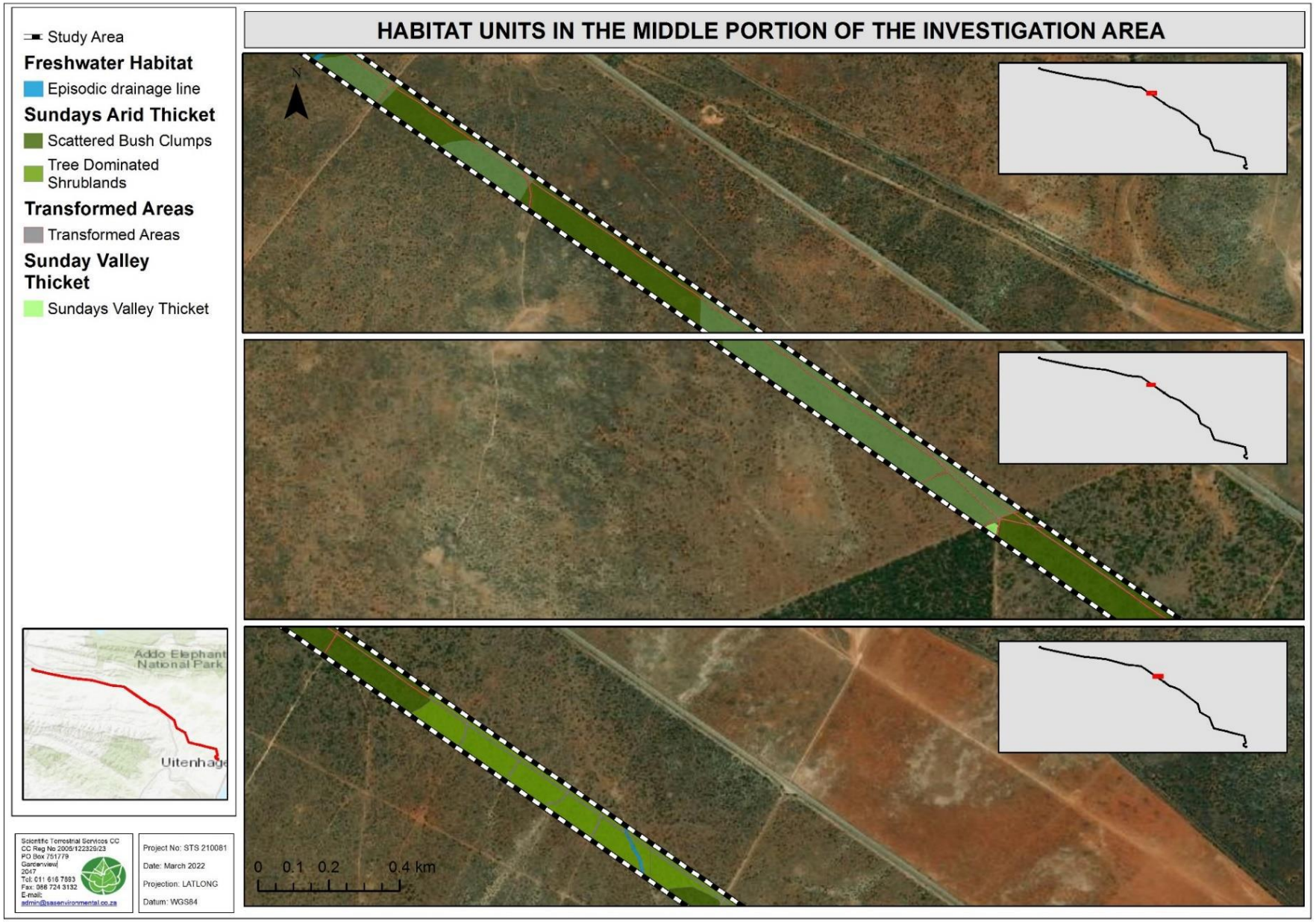


Figure 7: Distribution of the habitat units and sub-units located in the Middle Portion of the Investigation Area.

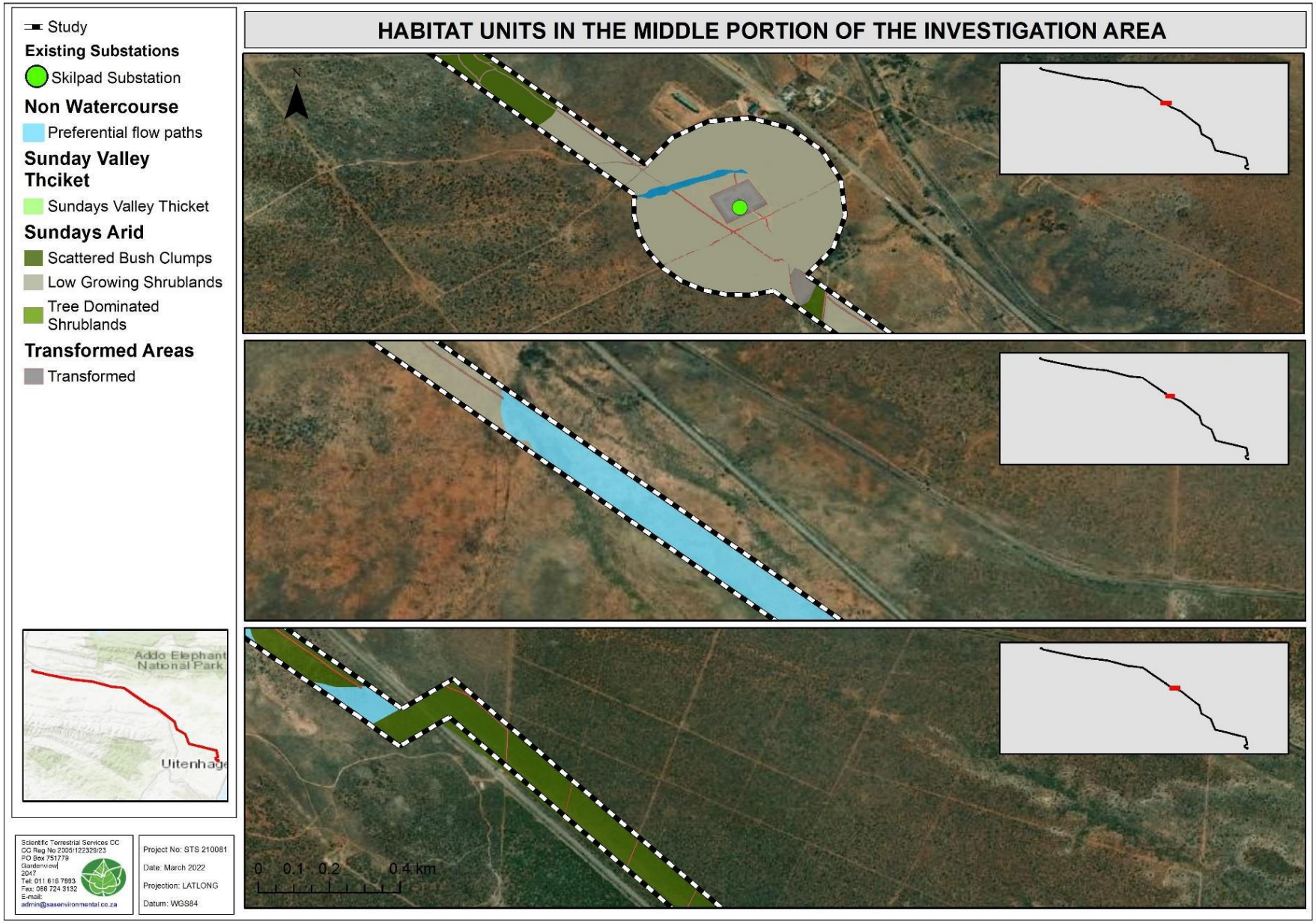


Figure 8: Distribution of the habitat units and sub-units located in the Middle Portion of the Investigation Area.

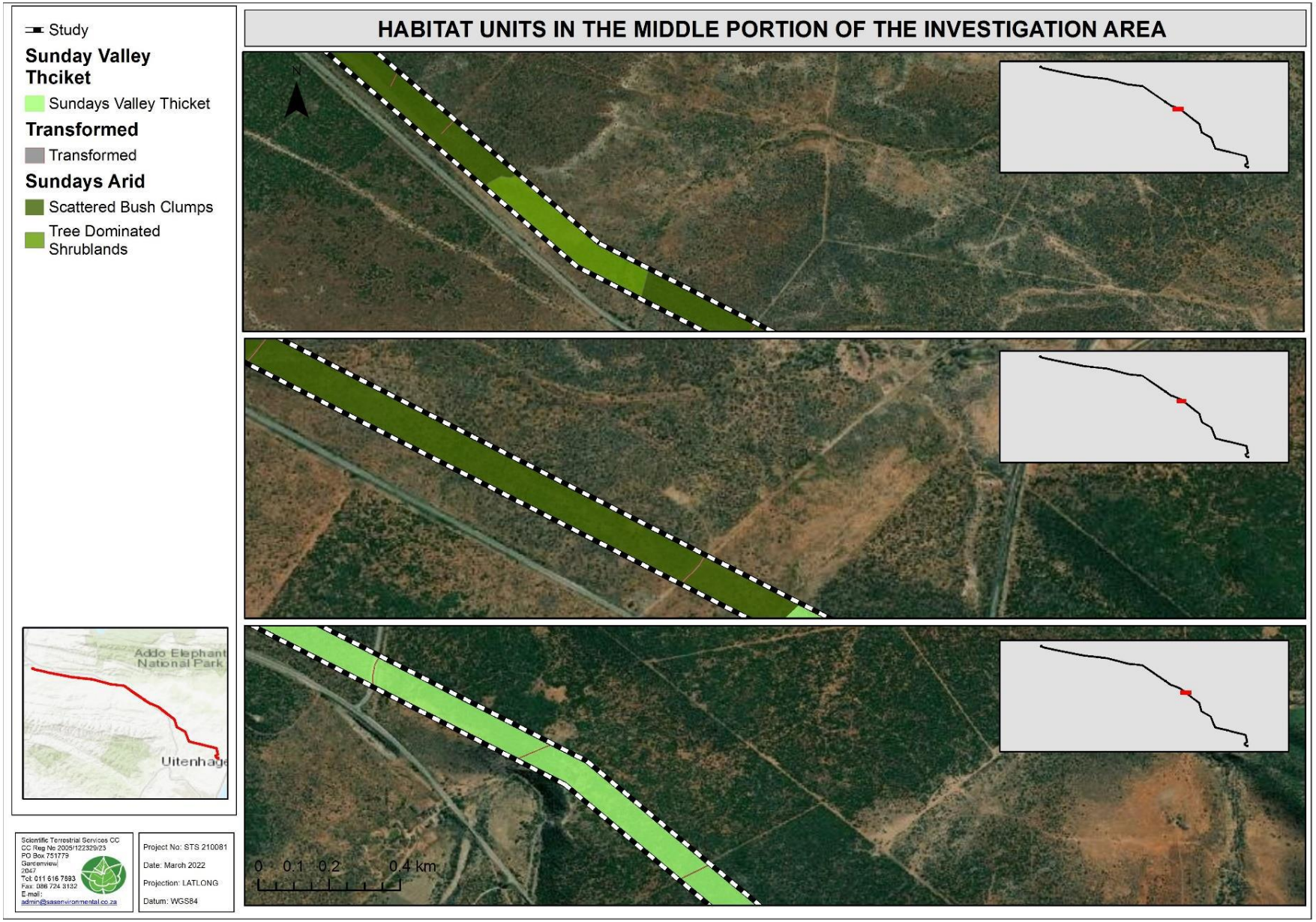


Figure 9: Distribution of the habitat units and sub-units located in the Middle Portion of the Investigation Area.

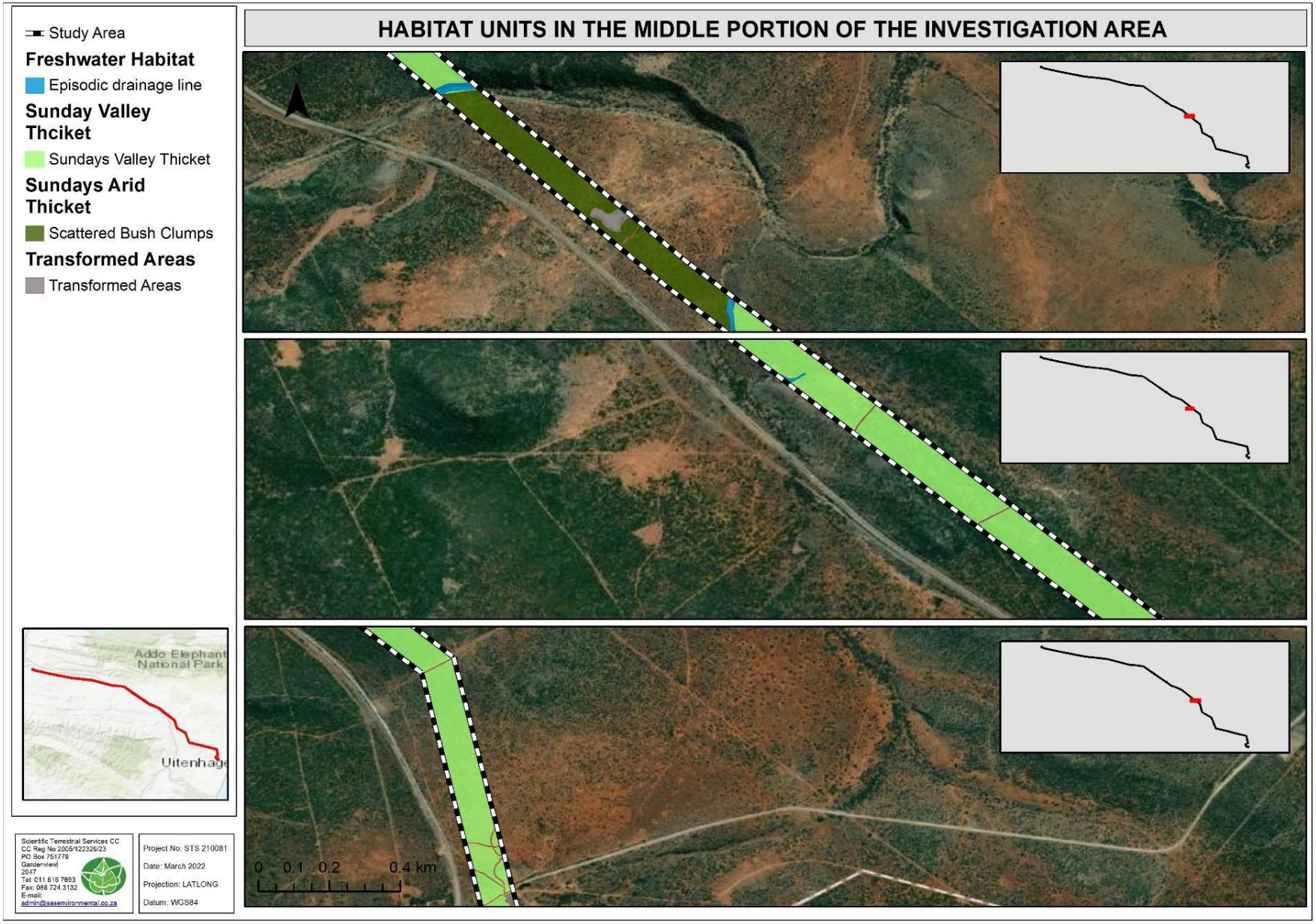


Figure 10: Distribution of the habitat units and sub-units located in the Middle Portion of the Investigation Area.

Figure 11: Distribution of the habitat units and sub-units located in the Lower Eastern Portion of the Investigation Area.

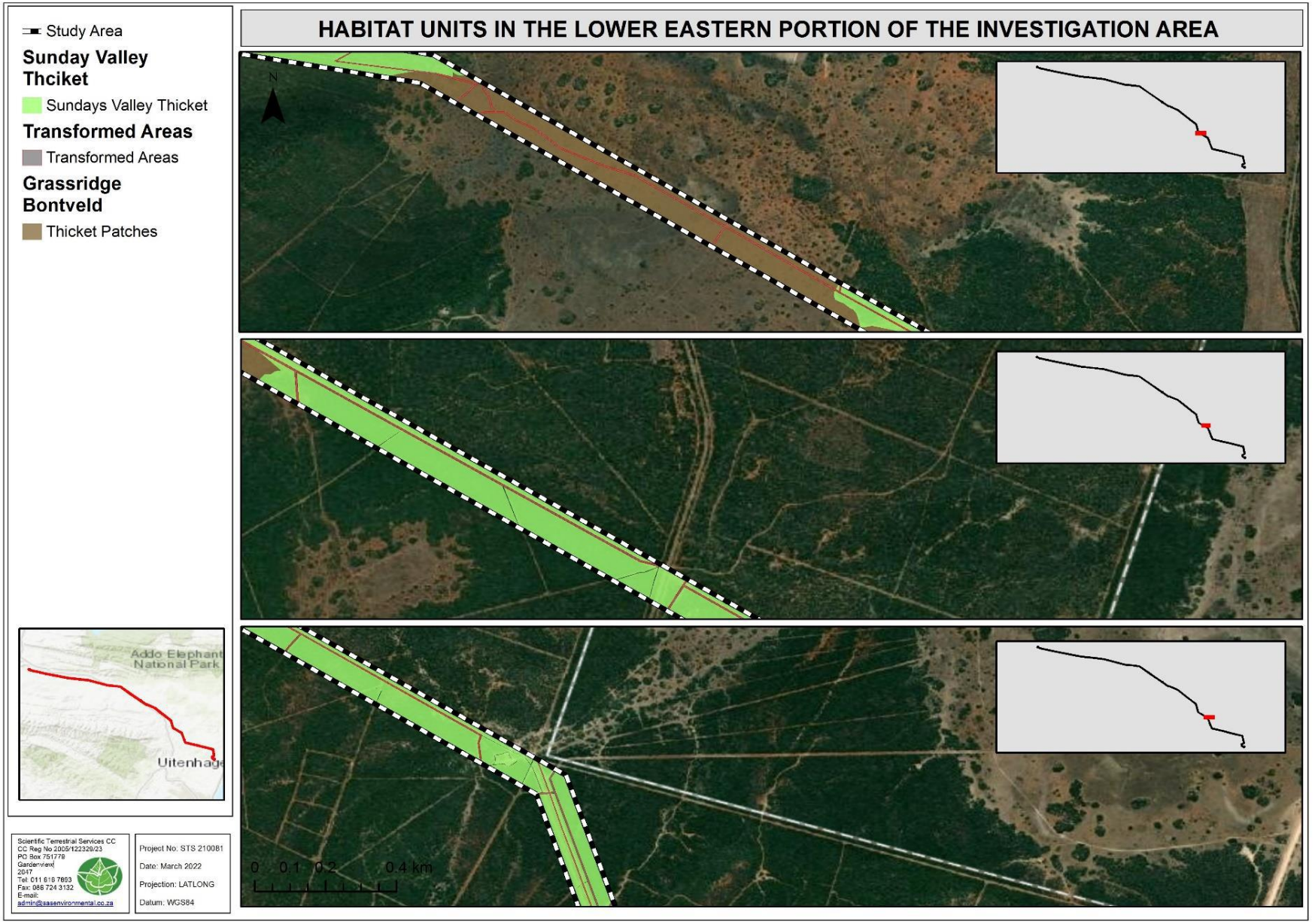


Figure 12: Distribution of the habitat units and sub-units located in the Lower Eastern Portion of the Investigation Area.

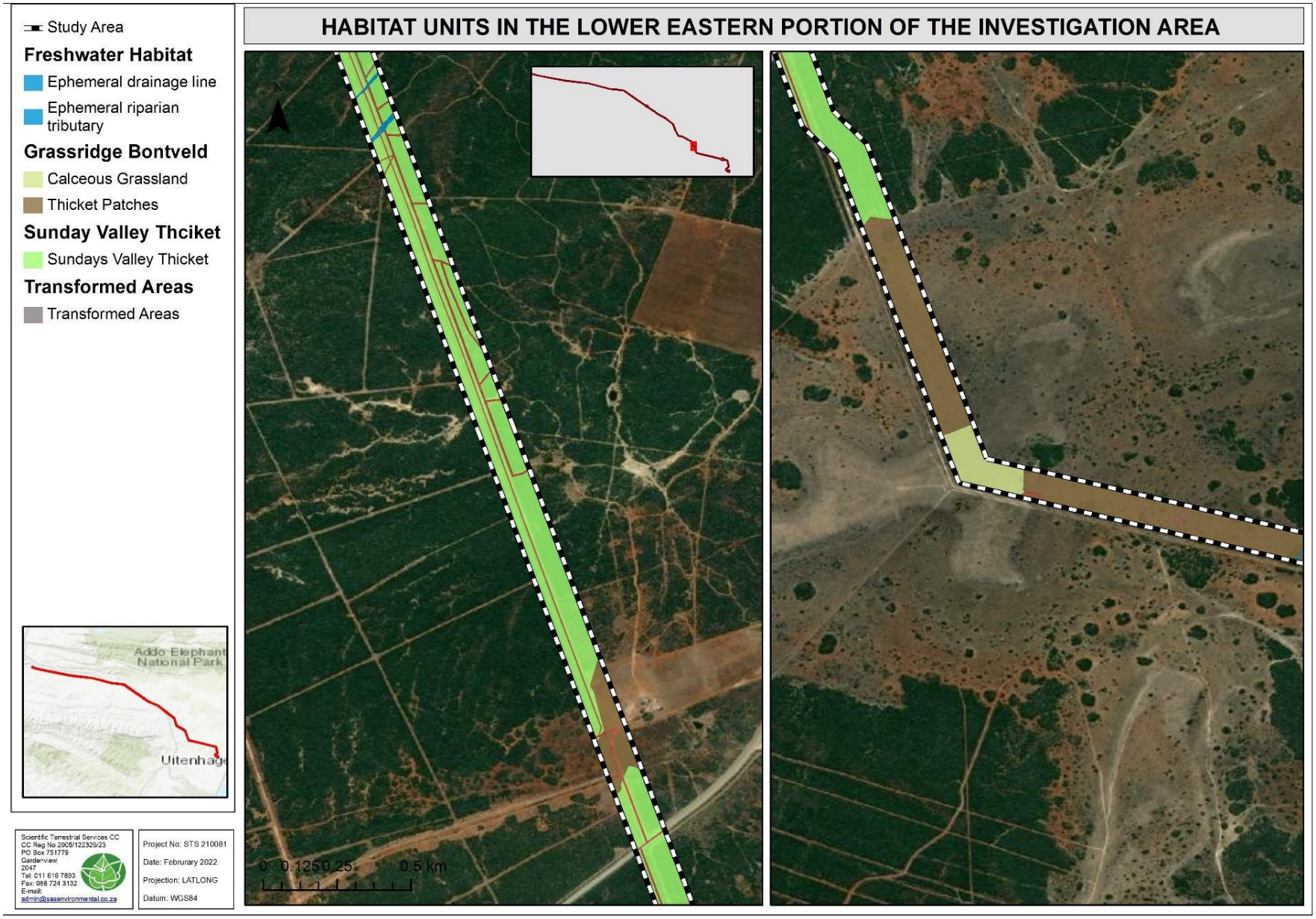


Figure 13: Distribution of the habitat units and sub-units located in the Lower Eastern Portion of the Investigation Area.

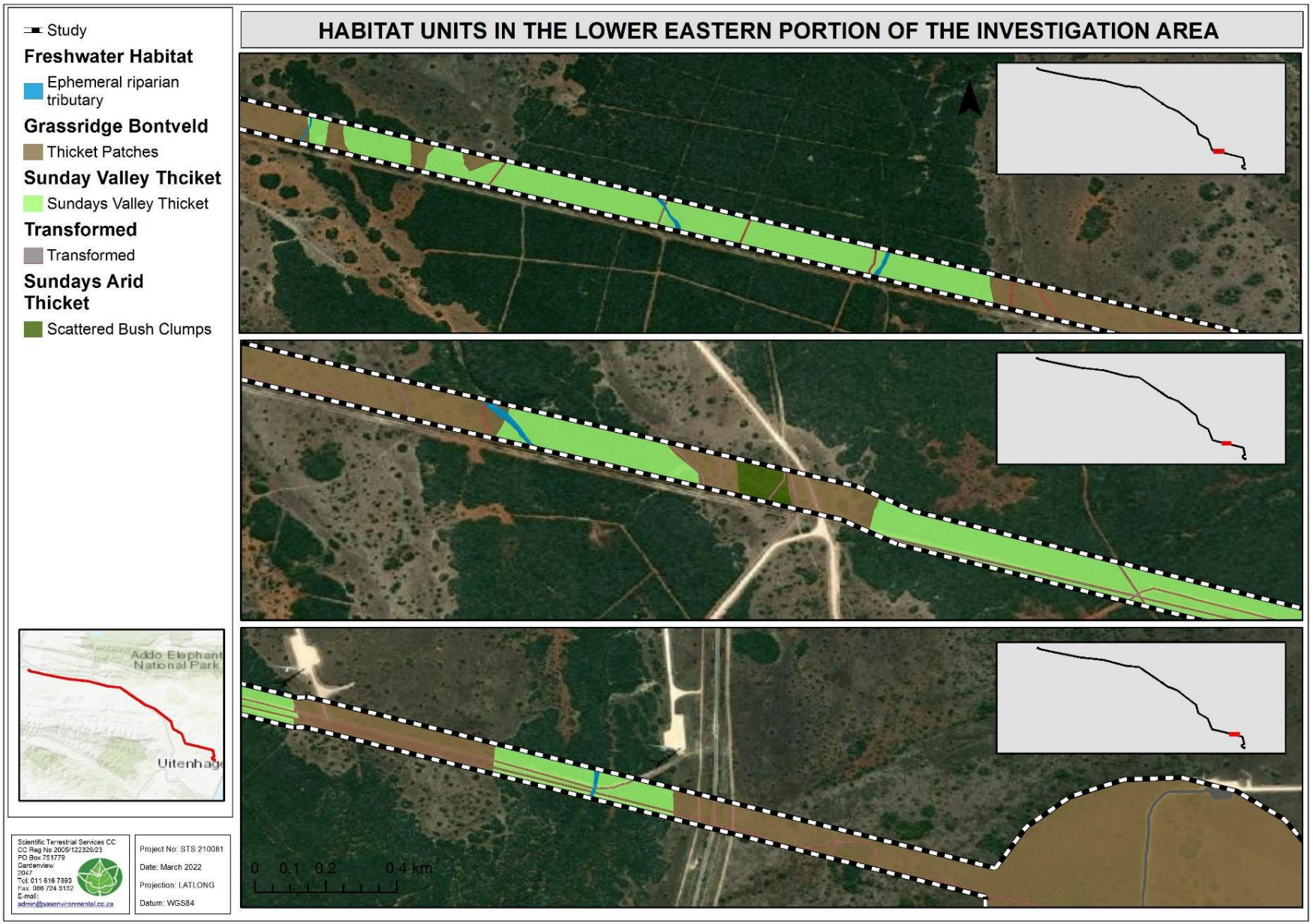


Figure 14: Distribution of the habitat units and sub-units located in the Lower Eastern Portion of the Investigation Area.

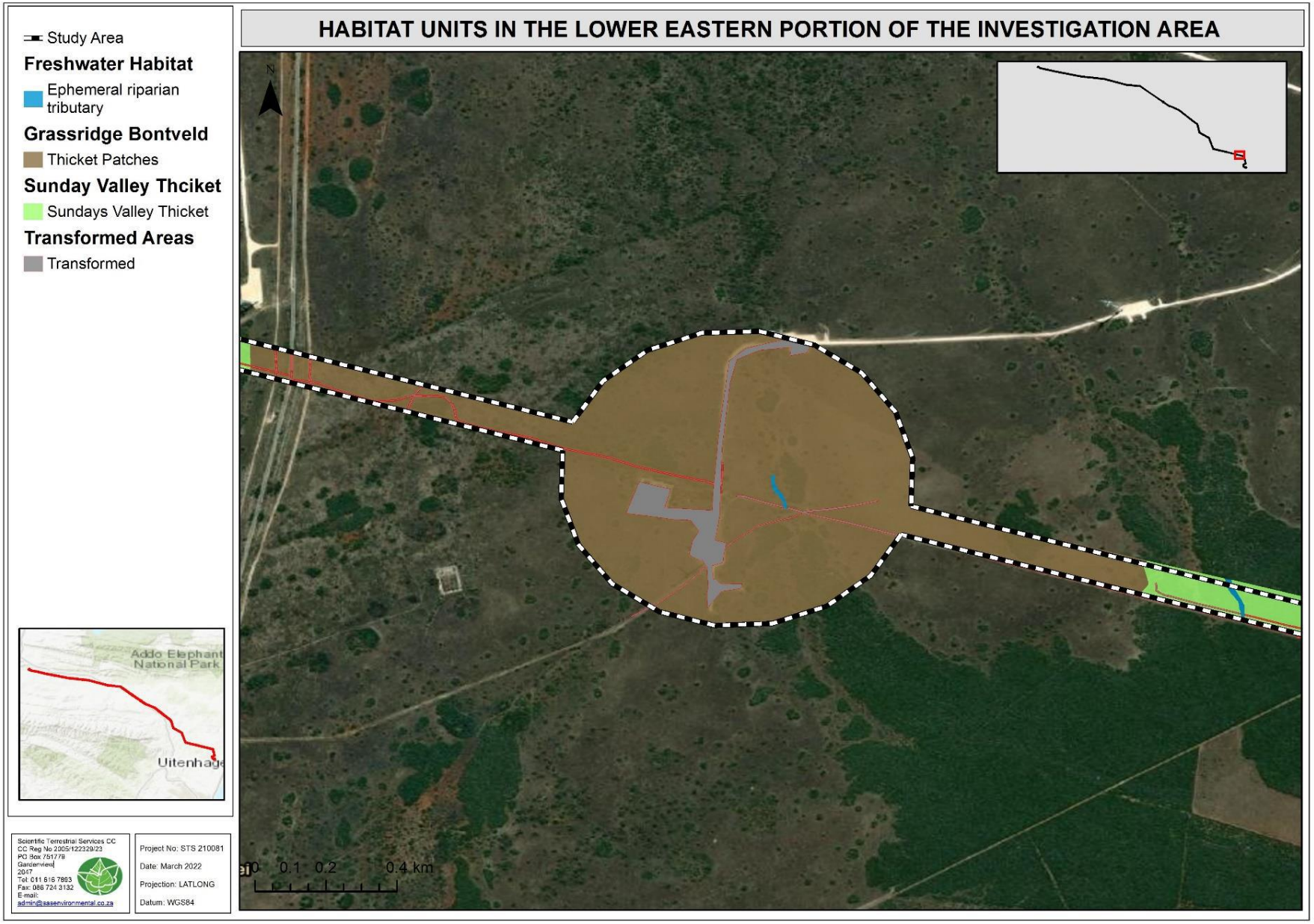


Figure 15: Distribution of the habitat units and sub-units located in the Lower Eastern Portion of the Investigation Area.

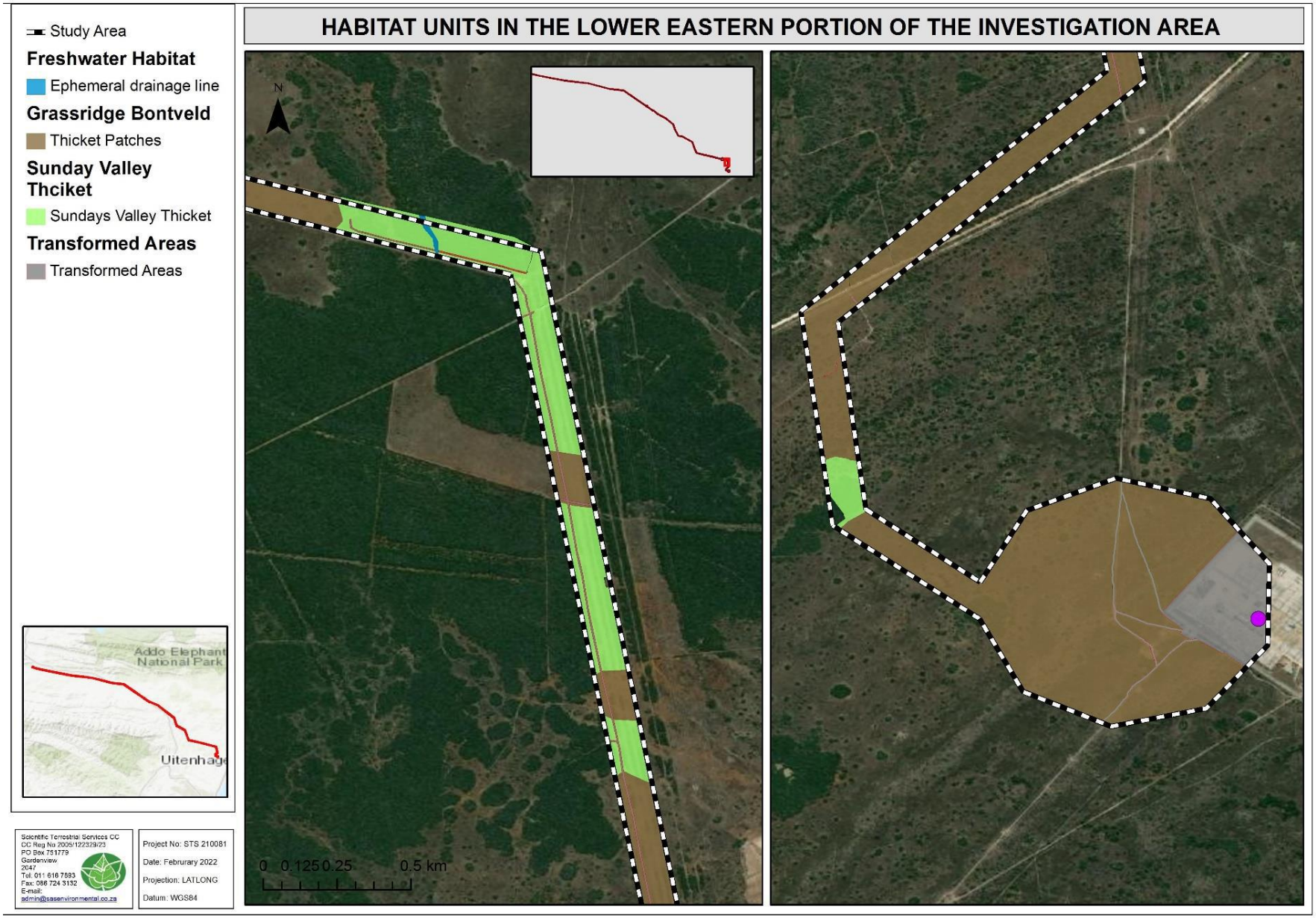


Figure 16: Distribution of the habitat units and sub-units located in the Lower Eastern Portion of the Investigation Area.

3.2 Mammals

Table 1: Field assessment results pertaining to mammal species within the habitat units associated with the investigation area.

SPECIES AND HABITAT RECORDED IN THE MRA

a) *Aepyceros melampus* (Impala), b) *Connochaetes gnou* (Black Wildebeest), c) *Damaliscus pygargus phillipsi* (Blesbok) and d) Spoor, possibly that of *Otomys* sp (Vlei rat).

e) *Procavia capensis ssp. capensis* (Cape rock hyrax), f) *Orycteropus afer* (Aardvark) spoor, g) *Ictonyx striatus* (Striped polecat) and h) *Phacochoerus africanus* (Warthog).

MAMMAL HABITAT AND DIVERSITY OVERVIEW

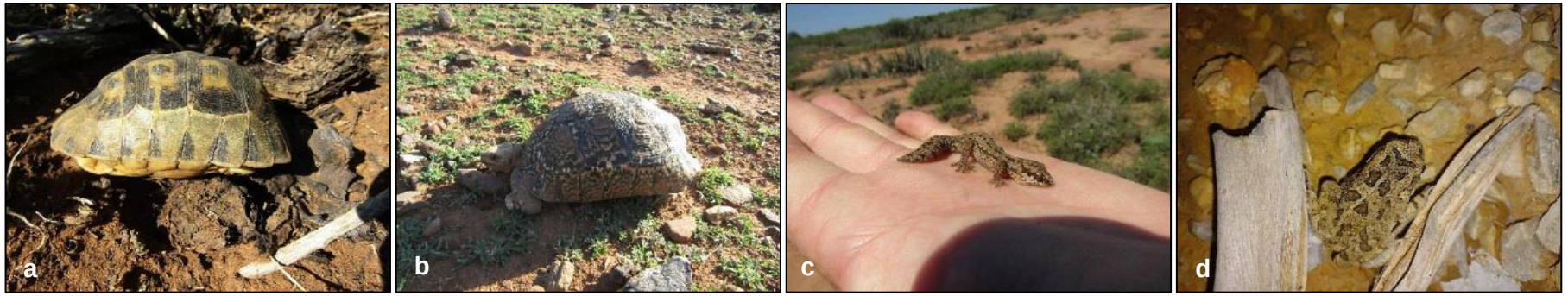
The Animal Demography Units (ADU) Virtual Museum indicates a total of 79 mammal records in the associated quarter degree squares (QDS), however, the area covered by this desktop data incorporates a far larger region including the Addo National Park. As such, mammal diversity from the online database is considered to be over representative of the mammal diversity associated with the OHPL. The habitats associated with the investigation area, although extensive in length, are narrow in width and as such, must be viewed in the context of the larger area. The western and central portions of the OHPL route traversed habitat that was of a more open nature in structure and for the most part, did not comprise of dense thickets. In the eastern half of the OHPL route, woody density increased with some areas comprising impenetrable woody thickets. Due to the short duration of the assessment not all mammal species present in the habitats were observed. From direct observations, spoor and other signs of mammal activity, it is evident that the habitats are capable of supporting several mammal species. Within the non-game farming land portions, a lower diversity and abundance of mammals was observed, whilst within the game farms, mammal diversity and abundance was notably higher. The game farm areas contained species typical of these operations, notably *Aepyceros melampus* (Impala), *Connochaetes gnou* (Black Wildebeest), *Connochaetes taurinus* (Blue Wildebeest), *Tragelaphus strepsiceros* (Kudu), *Damaliscus pygargus phillipsi* (Blesbok) with some game farms also containing *Syncerus caffer* (African Buffalo). It is highly likely that the game farm areas were inhabited with additional species that were not observed during the site visits, however given the narrow assessment area associated with the investigation area on the farms, not all these species will have been recorded. The livestock farms had a notably lower diversity and abundance of mammals, whilst wildlife species recorded on these properties are considered to be fairly common species that are known to range across multiple farms and for the most part tend not to be restricted by fences. Species observed in these areas include *Tragelaphus strepsiceros* (Kudu), *Phacochoerus africanus* (Warthog), *Sylvicapra grimmia* (Bush Duiker) and *Hystrix africaeaustralis* (Cape Porcupine) amongst others. Overall, food resources and habitat quality is considered suitable across the length of the OHPL route, with the open areas

being more suitable to grazers and browsers and the woody thickets more suited to smaller browsers and mixed feeders. Mesocarnivores are likely the dominant predators in the area with a low abundance of large predators considered likely.

MAMMAL SCC			
Species	**Discussion**	**Status**	**POC**
Acinonyx jubatus (Cheetah)	This species inhabits open areas where it can utilise its speed to chase down and capture prey items. There is a known cheetah sanctuary located across the road from the Skilpad substation. This species is often subjected to high levels of persecution from farmers and game farmers, as this predator is known to kill sheep and goats. Likewise, game farmers whose game is unaccustomed to predators becomes and easy food source for predators. The route does not, however traverse any properties with cheetahs and as such, the installation of the OHPL is unlikely to pose a direct threat to species.	VU	Medium
Chlorotalpa duthieae (Duthie's Golden Mole)	This species of golden mole is endemic to South Africa, typically inhabiting natural areas such as subtropical or tropical moist lowland forests, moist savannas and temperate grasslands. It is also known to occur within arable land, pastureland, plantations, rural gardens and urban areas. This species may be located between the Grassridge Private Nature Reserve and the Grassridge substation. Excavation activities for the pylons may pose a threat to this species, however, at the onset of vegetation clearance it is likely that any individuals will move out of the highly localised disturbance footprint. Further, the OHPL will not result in any habitat fragmentation or loss of habitat connectivity in the long term.	VU	Medium
Felis nigripes (Black-footed Cat)	This species is largely solitary, only coming together during periods of breeding. They are extremely secretive, venturing out at night to forage whilst spending the days in a den. They prey primarily upon small rodents and birds but are known to take reptiles and amphibians when presented with the opportunity. This species is widespread throughout South Africa, and it is possible that the OHPL traverses habitat that is utilised by individuals. Due to the nature of the OHPL though, notably the small footprint and limited to no impact on habitat connectivity, it is unlikely that any individuals present along the route will be significantly impacted upon.	VU	Medium
Panthera pardus (Leopard)	This species is adept at surviving within a variety of habitats with individuals likely associated with much of the OHPL route. Leopards for the most part select medium-sized prey but are known to take smaller prey species where the opportunity exists. They are, however often persecuted as they do kill livestock, leading to notable human – predator conflicts. Although there are no records of any leopards for the areas through which the OHPL traverses, the secretive nature and large home ranges (= lower abundances) of this species is likely the reason for this. The small footprint areas of the pylons are unlikely to impact on this species from a habitat availability or a habitat connectivity perspective.	VU	Medium
Dendrohyrax arboreus (Southern Tree Hyrax)	This species habitat includes various forest habitats, moist savannas and rocky areas. The tree hyrax lives in trees and is mostly nocturnal. Large raptors, mesocarnivores, large carnivores and feral dogs are the main predators, which may be a reasoning behind their nocturnal and arboreal habits (predator avoidance). Although some habitats along the OHPL route may be deemed suitable habitat, there are currently no records for this species in the areas through which the OHPL traverses. Additionally, the small disturbance footprint of the pylons would unlikely impact upon this species should they have occurred along the route.	EN	Low
Parahyaena brunnea (Brown Hyaena)	A species that has large home ranges. Mostly feeds upon small mammals, reptiles and carrion which may be supplemented with wild fruits and bird eggs. Often persecuted as they have been known to predate on livestock, though the extent of such predation is considered relatively low, however this may be affected by area and season. This species has observation records on the greater area and though not observed along the OHPL route, it is conceivable that they likely range through the area. The construction will not, however result in any impacts on this species nor its movement patterns	NT	Medium
Sensitive Species 7	Know to occur in wooded and forested areas along the coast and also coastal scrub farmland. They are selective foragers who frequent open areas but require the dense wooded areas to take shelter and rest. They are not far-ranging species, often living in pairs within small home ranges. These small home ranges and often places them at increased risk to feral and hunting dogs. This species may occupy the dense thicket areas in the east of the OHPL. The clearing of the dense bush areas may disturb resting individuals; however they are fast moving and will easily be able to flush ahead of such activities. Vegetation clearance and construction may, however force some individuals to relocate their home ranges to non-impacted areas, which may put them into direct competition with other individuals or lead to the migration of individuals to suboptimal habitat where they are at increased risk of poaching and snaring.	VU	High
Orycteropus afer (Aardvark)	This species is widespread throughout South Africa and well represented in both formally protected areas and private lands. Nocturnal by nature, it is not often observed, with only its tracks and excavations giving away its presence. This species feeds solely on termites, excavating them with their powerful front feet and claws. There are several records of this species in the farmlands surrounding the OHPL, as well as tracks observed near the Wolf substation. Individuals likely move through the various farmlands whilst foraging. The OHPL poses not direct or indirect threat to this species, with habitat fragmentation is unlikely.	VU – EC listing, LC - national	Confirmed
CONCLUDING REMARKS			
The OHPL traverses several habitats that do, and are able to, support several mammal species. Currently, mammal occupancy of the various habitats is largely driven by the current land uses, habitat and food resource availability. The livestock farming areas were the least diverse in terms of mammals, whilst the game farms had a higher mammal diversity, notably of larger mammals. The OHPL is unlikely to present a notable threat to mammal species in the region, with minor displacement of individuals expected during the construction phase but the overall footprint of the pylons is small and widely spaced out. The overhead conductors further pose little risk to mammals during the operational phase.			

3.3 Herpetofauna (Reptiles and Amphibians)

Table 2: Field assessment results pertaining to amphibian species within the sites associated with the investigation area.

SPECIES AND HABITAT RECORDED IN THE MRA
 **a) *Chersina angulata* (Angulate tortoise); b) *Stigmochelys pardalis* (Leopard Tortoise); c) *Pachydactylus mariquensis* (Marico Thick-toed Gecko) and d) *Amietophrynus rangeri* (Raucous Toad).**
 **e) *Tomopterna tandyi* (Tandy's Sand Frog), f) *Karusasaurus polyzonus* (Karoo Girdled Lizard) and g) *Pedioplanis lineoocellata pulchella* (Common Sand Lizard).**
HERPETOFAUNA HABITAT AND DIVERSITY OVERVIEW
According to the ADU database, 17 amphibian species and 55 reptile species have been recorded within the QDS's through which the OHPL traverses. Considering the landscape and the habitat therein, it is likely that many of these species may occur within the habitats associated with the OHPL. Reptiles are highly resilient species, often able to persist in the most arid environments as well as urban areas. Long terms droughts that have gripped the region have no doubt take their toll on many species, however the lower energy rates of reptiles will likely have allowed them to persist in the habitats, although at lower abundance levels. Several reptile species were observed along the OHPL route, with with *Stigmochelys pardalis* (Leopard Tortoise) and *Karusasaurus polyzonus* (Karoo Girdled Lizard) the most commonly observed. Reptiles were most commonly observed in the central and western portions of the OHPL route, with no reptiles observed in the eastern portions. This however may be as a result of the denser vegetation in the east limiting observation potential. Amphibian species observations were lower than expected, considering the number of farm dams / ponding along the route. The low amphibian observation rate should not, however be taken as an assumption of low amphibian diversity, as the survey was constrained to daily hours that are generally outside of peak amphibian activity. Additionally, the limited time available at each water point and access issues to some of the river sections further limited amphibian sampling potential. Food resources for herpetofauna appeared abundant, with numerous edible herbaceous species growing

and an abundant and accessible insect diversity observed along the route. Although not observed, several snakes will likely also occur along the OHPL route such as *Bitis arietans arietans* (Puff Adder), *Boaedon capensis* (Brown House Snake), *Psammophis notostictus* (Karoo Sand Snake) and *Lycophidion capense* (Cape Wolf Snake).

HERPETOFAUNAL SCC

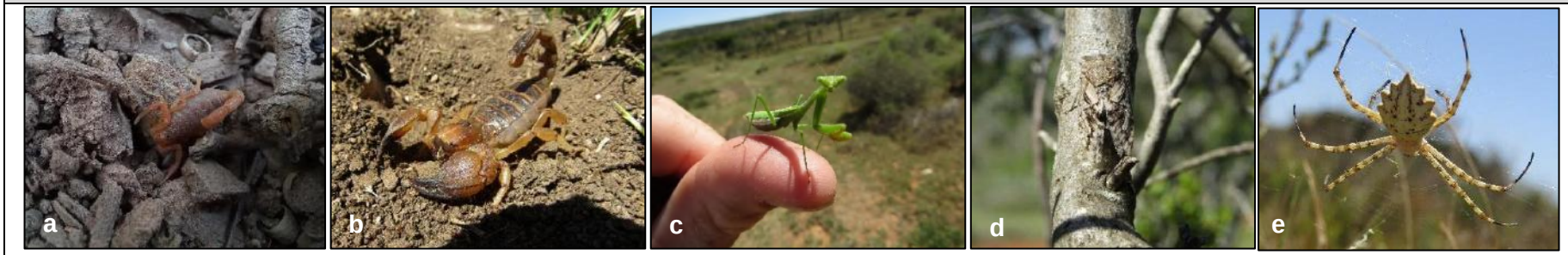
Species	Discussion	Status	POC
Sensitive species 18	Found in the Bonteveld vegetation and occurs northeast of Port Elizabeth on limestone and calcareous areas associated with the eastern portions of the OHPL route. The main threat at present to this species is the loss of habitat, with current limestone mining (Approximately 2.3km north of the OHPL where it crosses the Grassridge Nature Reserve and 3.2km south-west of the Grassridge substation) likely to result in further significant habitat loss in the years to come. As this species is not known from any other localities or vegetation types, this loss of habitat may result in the total loss of this species. Given the high risk of habitat loss to this species, the pylons within the Grassridge Bonteveld do pose a risk to this species, likely not as a direct impact but indirectly through habitat loss.	CR	High
Chersobius boulengeri (Karoo Padlooper Tortoise)	This tortoise is small, with a relatively flat, brown shell, and sometimes olive to reddish or orange brown. Given its small stature, shy nature and relatively low densities, observation of this species is not common and difficult on surveys of short duration. It usually inhabits rocky outcrops and ridges of shale and ironstone within the Great Karoo. The Wolf substation and a small portion of the western OHPL intersects with the eastern extent of the known distribution of this species, though, there is a chance it may occur further east encompassing a larger extent of the OHPL. As such, any pylon located within rocky outcrops and ridges should be searched for this species prior to bush clearing with heavy machinery and earthmoving activities.	EN	Medium
Nucras taeniolata (Albany Sandveld Lizard)	A seemingly rare lizard that very little is known about. Previous observations have found it making use of both soft and hard soils and shale areas in mesic environments. It likely burrows into the soil at the base of bushes and shelter under rock slabs. This species distribution overlaps with the OHPL from approximately the Grassridge Private Nature Reserve to the Grassridge substation, with several records from this area according to the Reptile Map of the ADU. Vegetation clearance and earthmoving activities will pose a threat to this species should any individuals be located along the route.	NT	Medium

CONCLUDING REMARKS

Although very few amphibians and reptiles were observed along the proposed OHPL route, this is more likely attributable to the short sampling period due to project constraints and not the true diversity of herpetofauna in the region. Installation of the pylons will require vegetation clearance and earth moving activities. These activities pose a direct risk to small and slow-moving reptiles, notably the SCC and as such, these risks will have to be mitigated accordingly. Although the footprint areas of the pylons are not expected to be extensive, they will still result in habitat loss. Vegetation below the conducting wires will also be cut and maintained at a low level, further inhibiting habitat provisioning for reptiles, notably the above listed SCC (especially Sensitive Species 18).

3.4 Invertebrates (Insects and Arachnids)

Table 3: Field assessment results pertaining to insect species within the sites associated with the investigation area.

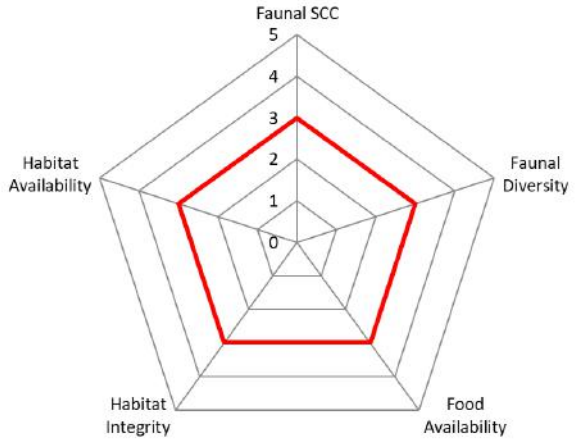
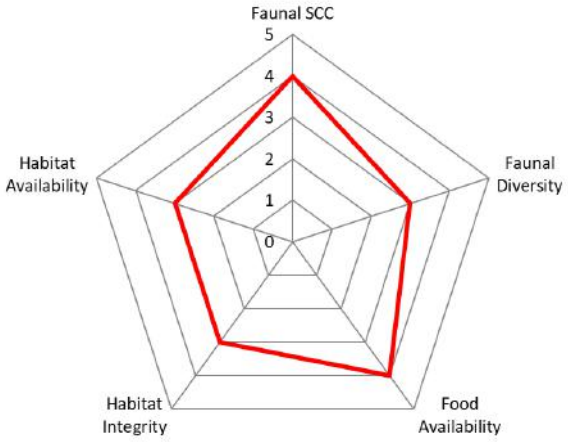
SPECIES AND HABITAT RECORDED IN THE MRA
 **a) *Parabuthus planicauda* (Drab Thicktail Scorpion); b) *Opistophthalmus pictus* (Burrowing Scorpion); c) Family Mantidae (Mantids); d) *Platypleura capensis* (Cape Orange-wing Cicada) and e) *Agriope* sp (Garden Orb-web Spider)**
 **f) *Rhachitopis* sp (Grasshopper); g) *Brephidium metophis* (Tinktinkie Pygmy Blue); h) *Colotis euippe* (Round-winged Orange Tip); i) *Sympetrum fonscolombii* (Red-veined Darter) and j) *Quintilia wealei* (Karoo Cicada).**
INVERTEBRATE HABITAT AND DIVERSITY OVERVIEW
The OHPL route traversed areas with varying invertebrate diversity and abundances, notably, invertebrate abundance and diversity appeared to increase from west to east with vegetation density. The extended drought period that has gripped the region no doubt has had an impact of invertebrate diversity, notably in the more arid western section of the OHPL. Many insects and their lifecycles are reliant on rainfall events as triggers for breeding / various life stages. The decreased rainfall and subsequently decreased food resources for insects likely contributed significantly to invertebrate losses in the region. More recently, good rainfall events have occurred which has spurred on insect breeding rates, though, at present insect prevalence appears to be the more common, rapidly breeding species. With time and continued habitat recovery more selective and niche insect species populations will likely recover. Insect species form the primary food source of many arachnid species, consequently, a decrease in insect species has resulted in a decreased arachnid abundance and diversity. Populations, however appear to be recovering rapidly, with an increased abundance noted between the first (February 2022) and second (March 2022) site assessment, a period of approximately 5 weeks, notably of plant dwelling and web building spiders. Arachnid species are notoriously hard to detect during site assessments of limited duration, notably due to their largely nocturnal and secretive habits, though, several individuals were still observed during the site assessment, indicating a healthy arachnid population associated with the OHPL habitats. For the associated QDS sites, the ADU has 96 Lepidoptera records, 51 Odonata records, 5 scorpion record and 7 spider records. These records indicate that, as expected, insect diversity is high whilst arachnid diversity appears to be limited, though, as discussed above, this is likely more a result of detectability for of these species rather than a true reflection of diversity and abundance, which is likely much higher.

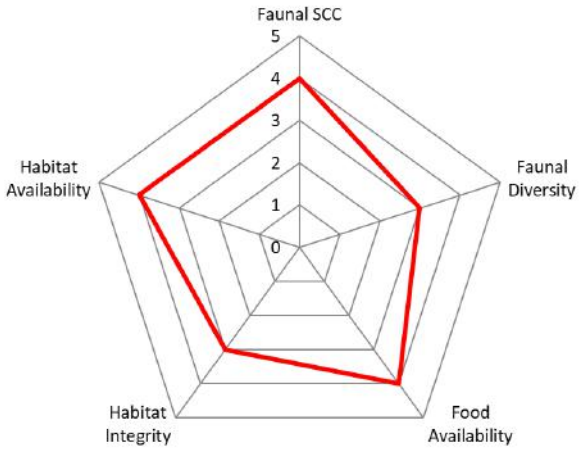
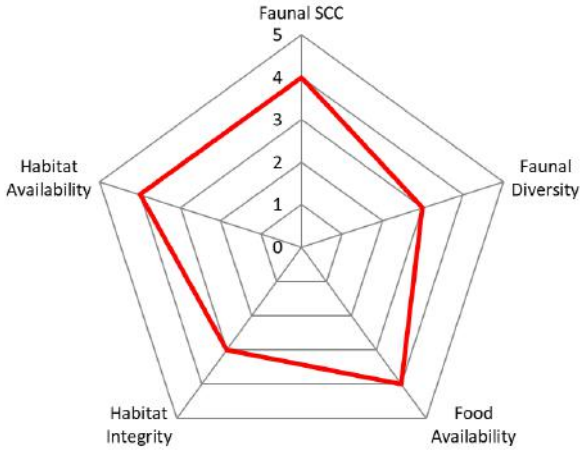
INVERTEBRATE SCC			
Species	**Discussion**	**Status**	**POC**
Ceratogomphus triceraticus (Cape Thorntail)	According to the ADU records, the eastern half of the OHPL is likely to traverse habitat utilised by this species. This species inhabits freshwater systems (streams) in open landscapes and / or in open forest areas. This species generally selects for calm flowing sections and pools where detritus material has built up as well rocky areas and pools / streams with a gravelly / sandy bottom. This species may be associated with the freshwater habitats that the OHPL traverses, though, the construction and operation of the OHPL is unlikely to pose a threat to this species.	NT	Medium
Aloeides clarki (Coega Russet)	According to the ADU records, this species is likely associated with the Grassridge substation and portions of the OHPL in the area. This species is generally associated with dry, sand and limestone ridges at altitudes between 30 m and 150 m. Vegetation clearance may impact this species due to habitat loss, though, given the small footprints of the pylons, impacts should be minimal during construction.	EN	Medium
CONCLUDING REMARKS			
Several invertebrates of varying Orders and Families were observed during the first site visit, with the habitats expected to support an increased diversity and abundance of invertebrate species. Following further vegetation growth and rainfall events, invertebrate abundance increased notably, with a smaller increase in diversity noted. The OHPL will result in clearance of vegetation for the pylons, however, these footprints are not expected to be large and as such, should not result in significant habitat loss. Post construction, the cleared footprints, notably in the dense thicket areas, may in fact allow for invertebrate species who select for more open areas to flourish in and amongst the denser stands of vegetation.			

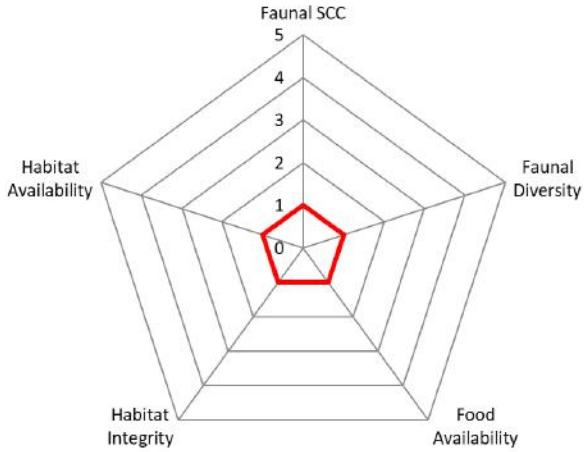
4 SENSITIVITY MAPPING

Figures 17 – 30 below conceptually illustrates the faunal ecological sensitivity for the various areas. The areas are depicted according to their sensitivity in terms of the presence or potential for faunal SCC, habitat integrity, levels of disturbance and overall levels of diversity. Table 4 below presents the sensitivity of each habitat along with an associated conservation objective and implications for the proposed activities.

Table 4. A summary of the sensitivity of each habitat unit and the implications for the investigation area.

Habitat Unit	Habitat Sensitivity Graph	Sensitivity	Key Considerations
Sundays Arid Thicket		**INTERMEDIATE** Conservation Objective Preserve and enhance biodiversity of the habitat unit and surrounds while optimising development potential	• This habitat unit is widespread throughout the local area; • The main land use currently undertaken within this habitat unit is farming, both livestock and game (wildlife); • Farming practices combined with the extended drought conditions has resulted in habitat degradation, impacting on faunal species habitat provision and food resources availability; • Species diversity and abundance within this habitat unit was moderate; and • This habitat unit can support faunal SCC, though, they will be reliant on the areas surrounding the proposed OHPL as well and not solely on the habitat within the OHPL servitude.
Sundays Valley Thicket		**INTERMEDIATE** Conservation Objective Preserve and enhance biodiversity of the habitat unit and surrounds while optimising development potential	• The main land use currently undertaken within this habitat unit is farming, both livestock and game; • Farming practices combined with the extended drought conditions has resulted in habitat degradation, impacting on faunal species habitat provision and food resources availability; • The dense vegetative structure of this habitat unit limits faunal species utilisation and grazing resources due to a decreased herbaceous layer in the densely vegetated areas; • Species diversity and abundance within this habitat unit was moderate; and • This habitat unit can support faunal SCC although, they will be reliant on the areas surrounding the proposed OHPL as well and not solely on the habitat within the OHPL servitude associated with the investigation area.

Habitat Unit	Habitat Sensitivity Graph	Sensitivity	Key Considerations
Grassridge Bonteveld		**MODERATELY HIGH** Conservation Objective Preserve and enhance the biodiversity of the habitat unit, limit development and disturbance.	• This habitat unit is located in the eastern extent of the proposed OHPL and provides suitable habitat and foraging resources for fauna; • Several of the SCC, notably the invertebrates, herpetofauna and smaller mammals are likely to utilise this habitat unit, with some of these species being range restricted to the local region; • Regionally, this habitat unit has experienced significant habitat loss, placing increased pressure on faunal species herein and an increased cumulative loss of habitat form the region; • Provides niche habitat for some of the smaller range restricted reptiles species in the region; and • Strategic and careful placement of powerline pylons and access roads will be required to suitably minimise and manage habitat and species impacts.
Freshwater Habitat		**MODERATELY HIGH** Conservation Objective Preserve and enhance the biodiversity of the habitat unit, limit development and disturbance.	• This habitat, due to an increase in surface water collection / presence both permanently and seasonally, is considered important for fauna; • Due to increased soil moisture, there is an increase in vegetative growth and as such, an increase in food resources for herbivorous species; • The freshwater systems further provide niche habitat for water dependant species; and • Serves as an important water resource for all faunal species in the region.

Habitat Unit	Habitat Sensitivity Graph	Sensitivity	Key Considerations
Transformed areas		**LOW** Conservation Objective Optimise development potential.	• Comprises all transformed areas where natural vegetation is no longer present; and • Is not considered important for faunal habitat or food resource provisioning.

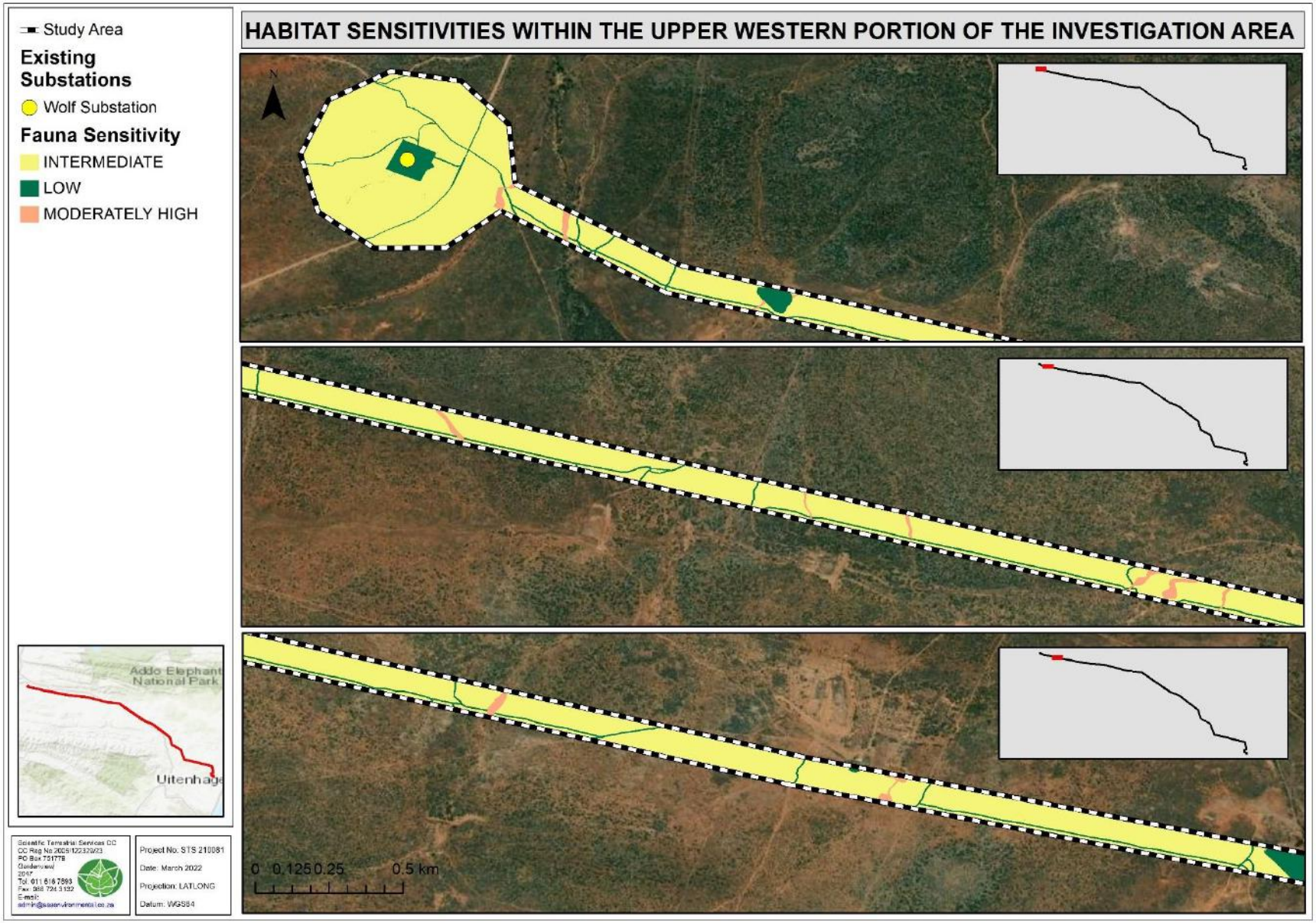


Figure 17: Faunal habitat sensitivities associated with the investigation area.

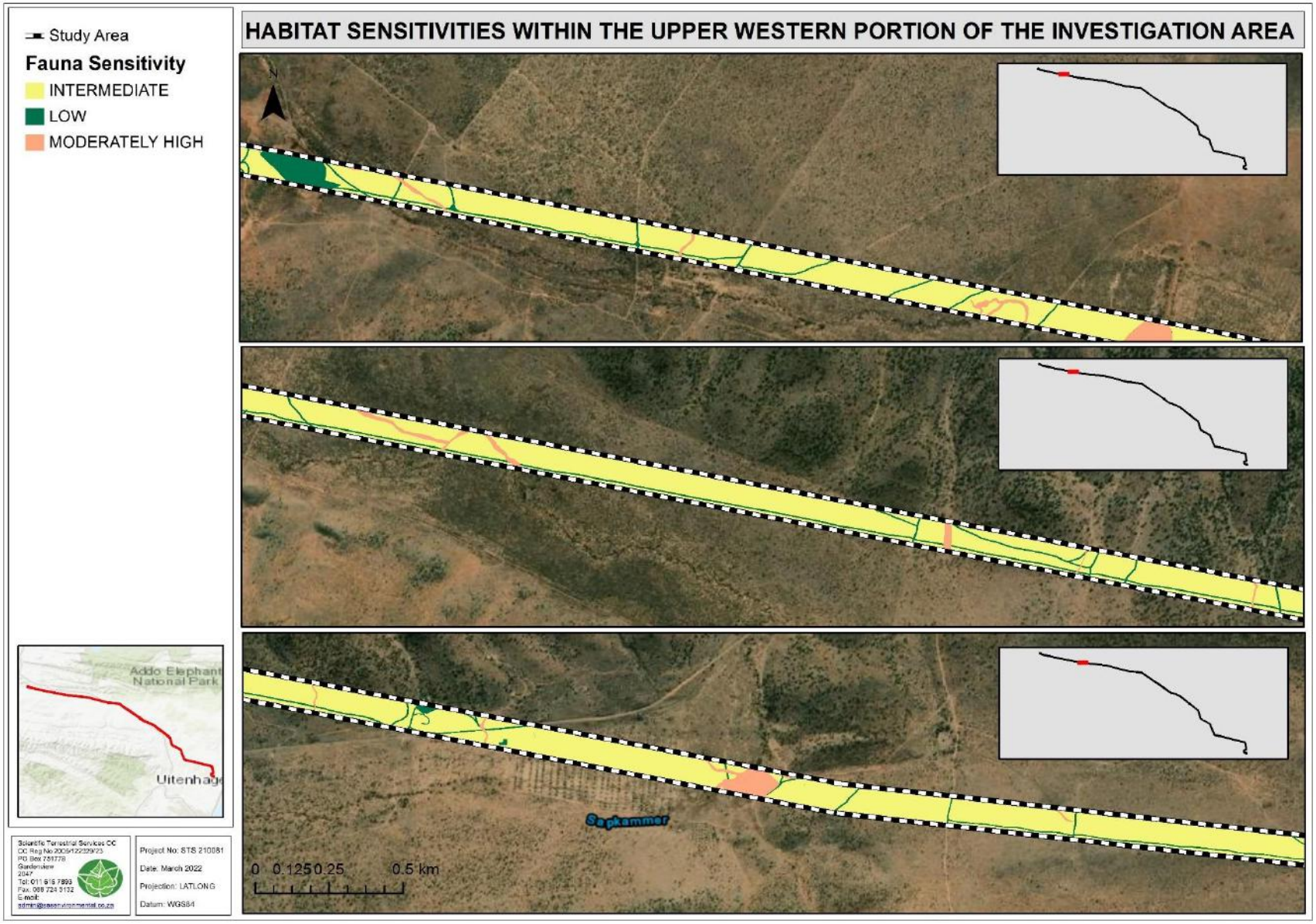


Figure 18: Faunal habitat sensitivities associated with the investigation area.

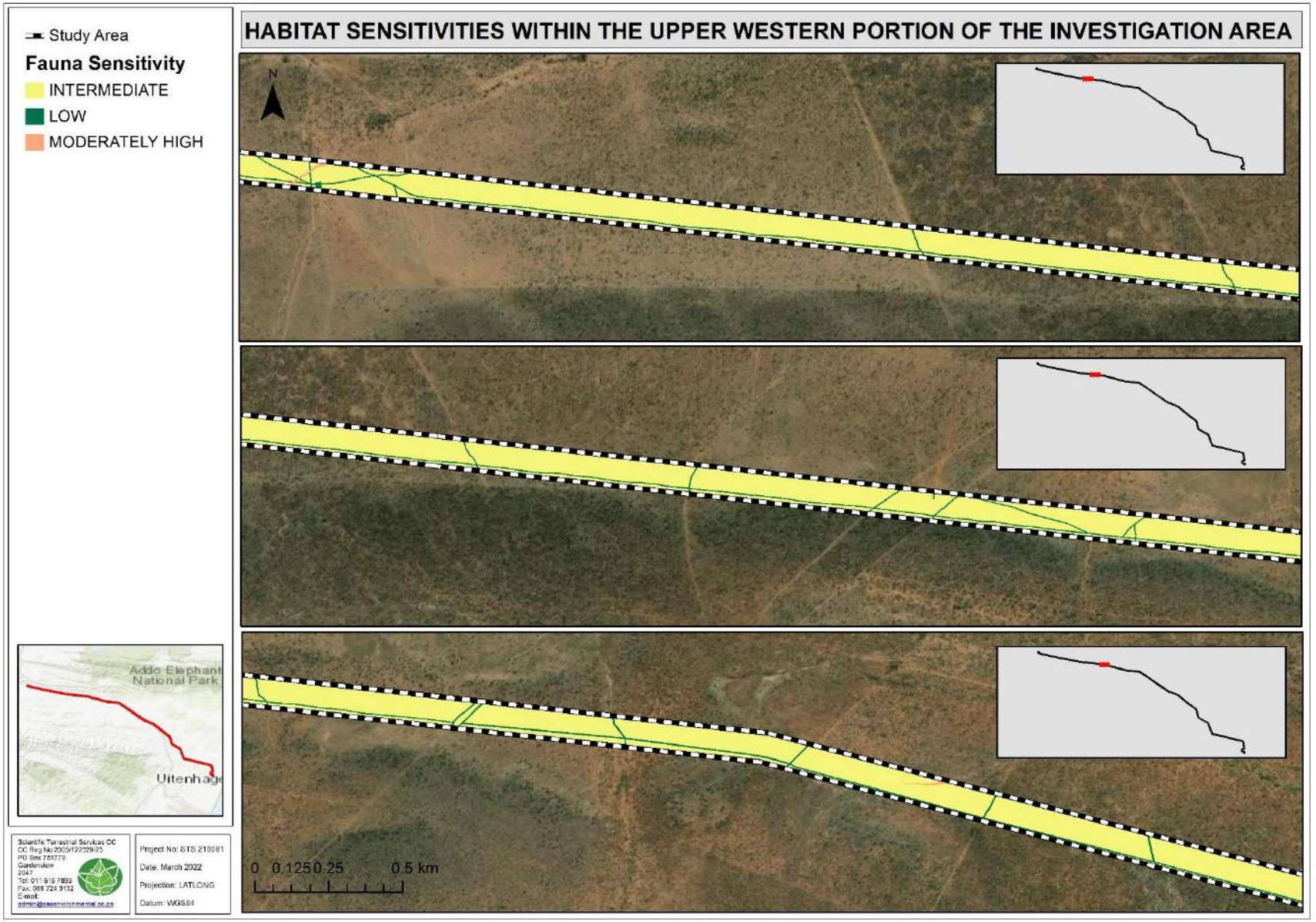


Figure 19: Faunal habitat sensitivities associated with the investigation area.

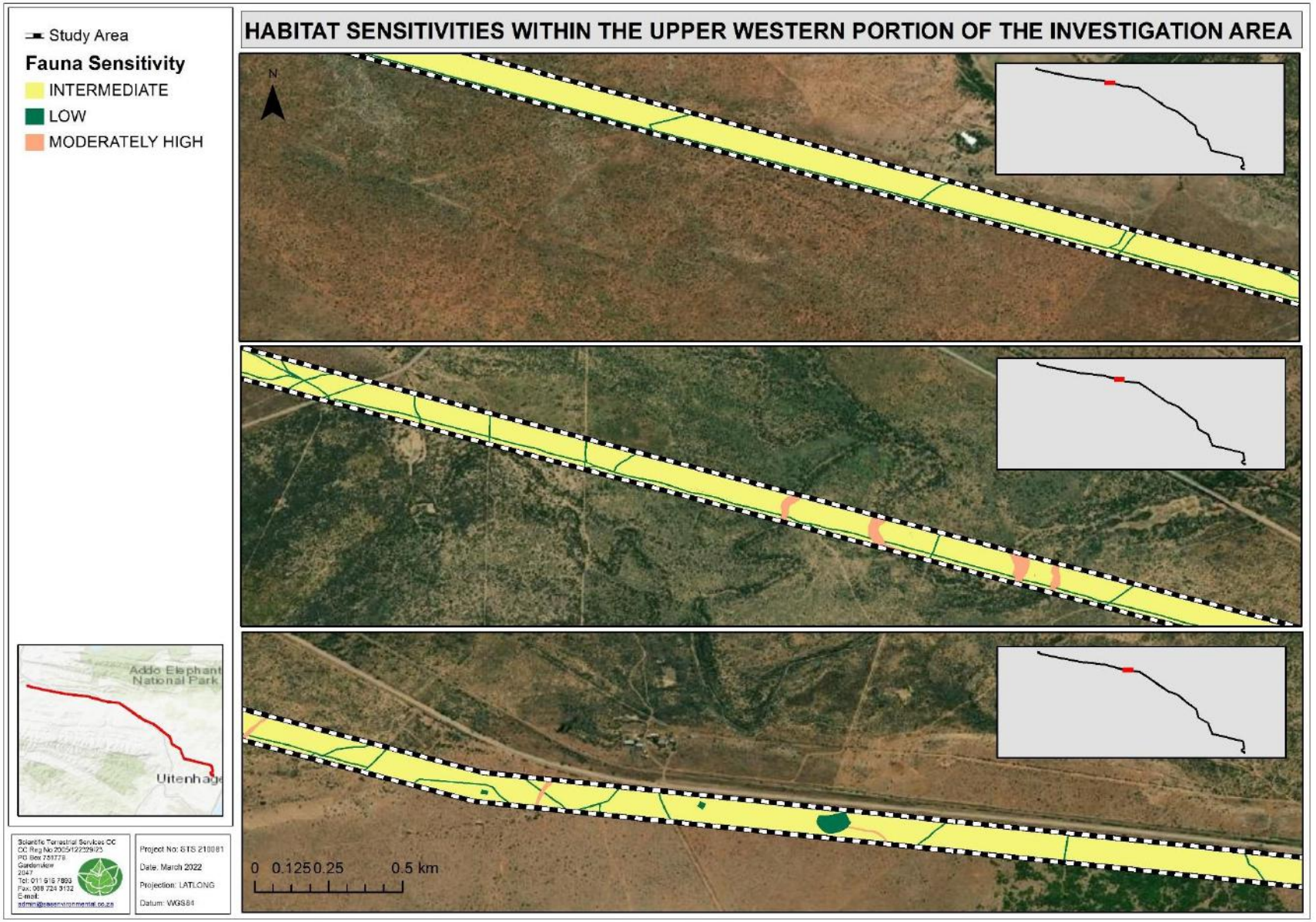


Figure 20: Faunal habitat sensitivities associated with the investigation area.

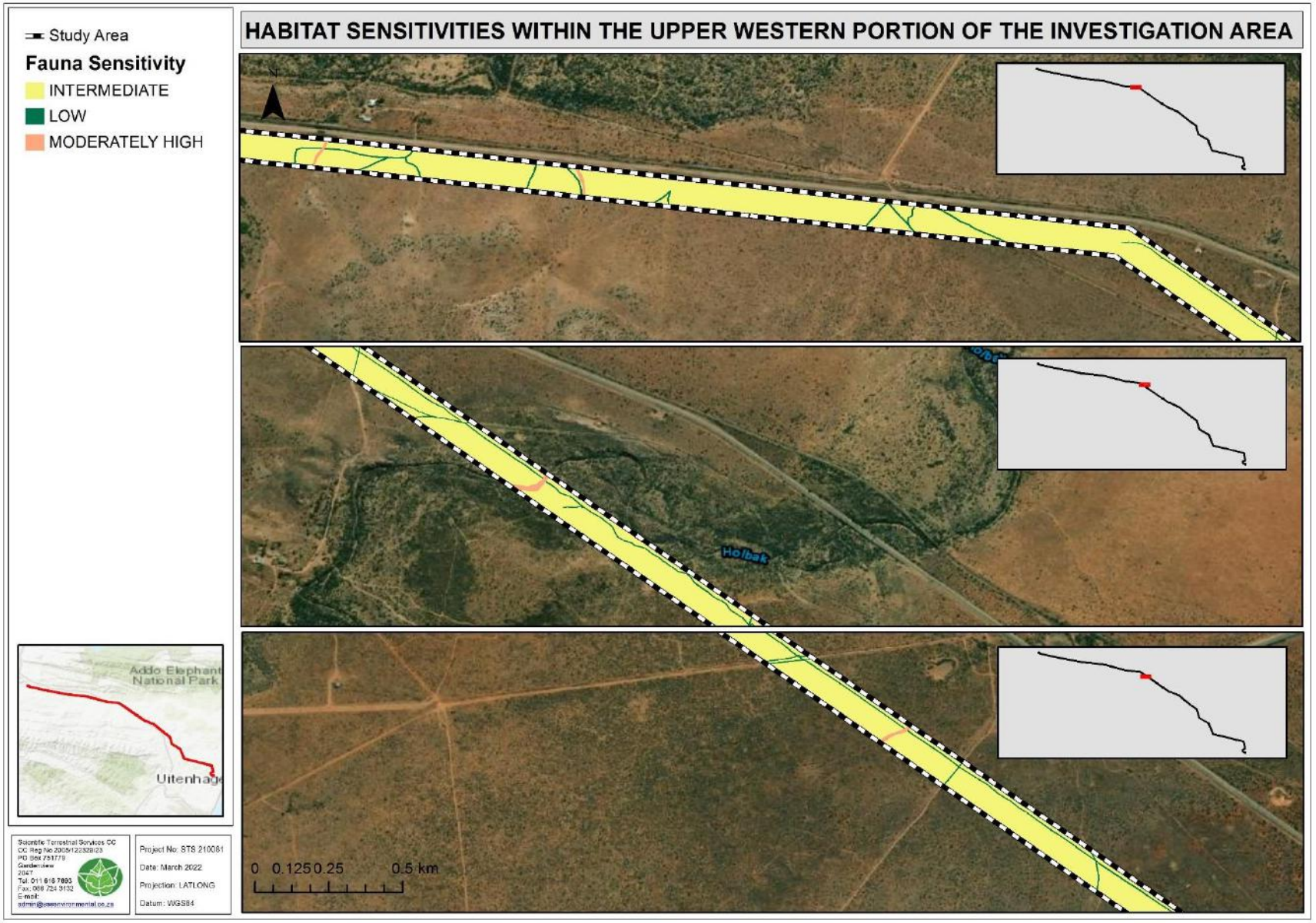


Figure 21: Faunal habitat sensitivities associated with the investigation area.

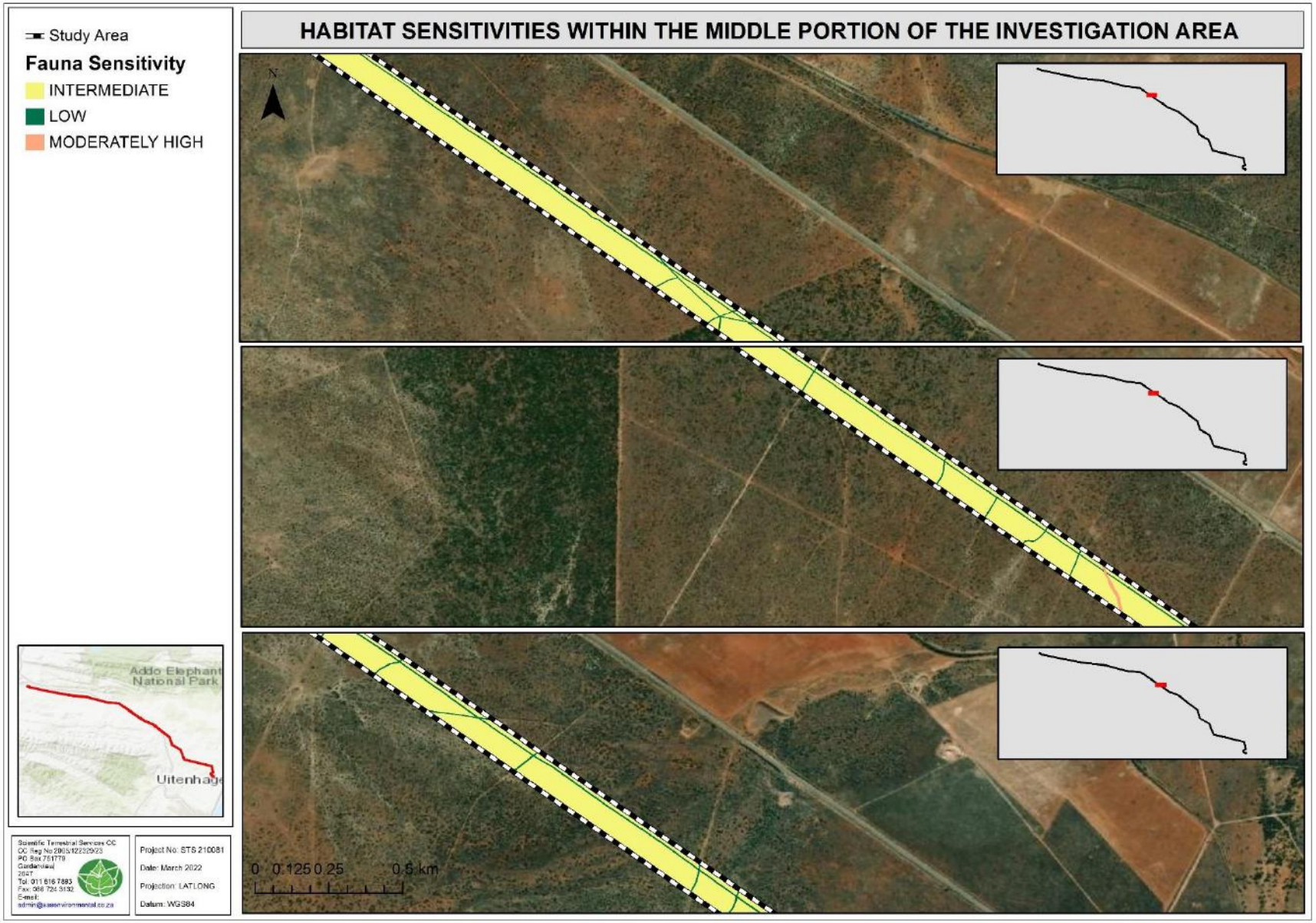


Figure 22: Faunal habitat sensitivities associated with the investigation area.

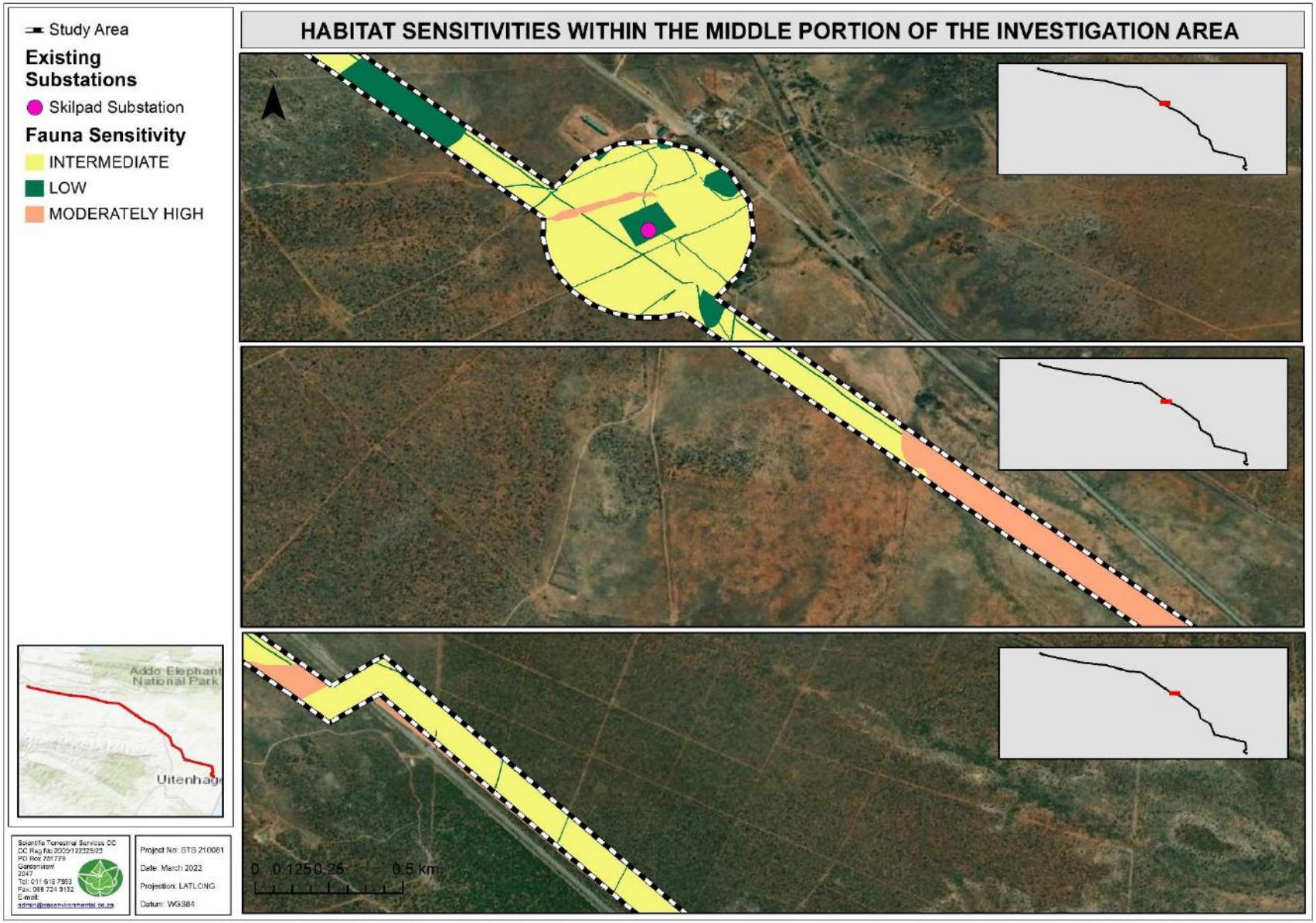


Figure 23: Faunal habitat sensitivities associated with the investigation area.

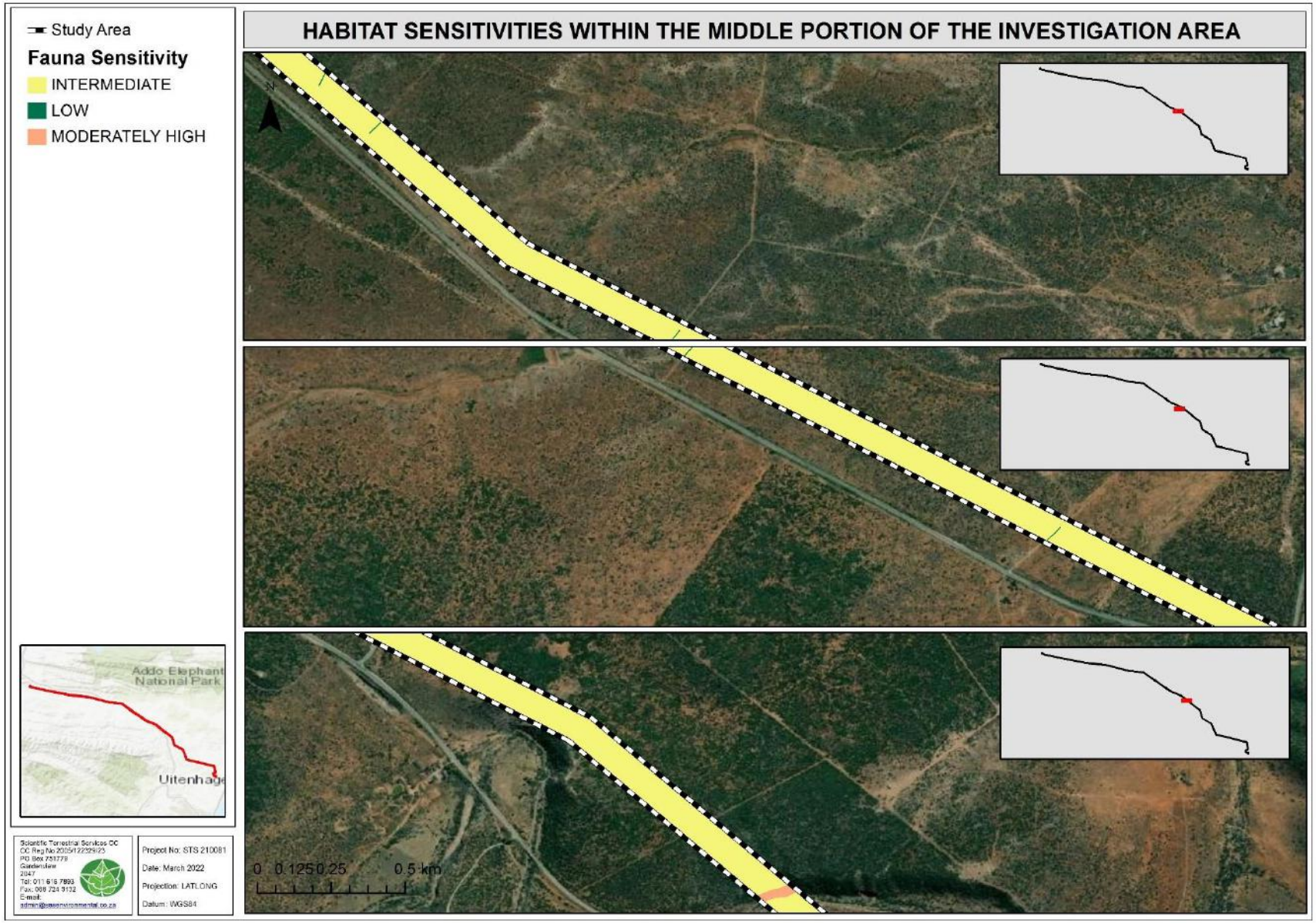


Figure 24: Faunal habitat sensitivities associated with the investigation area.

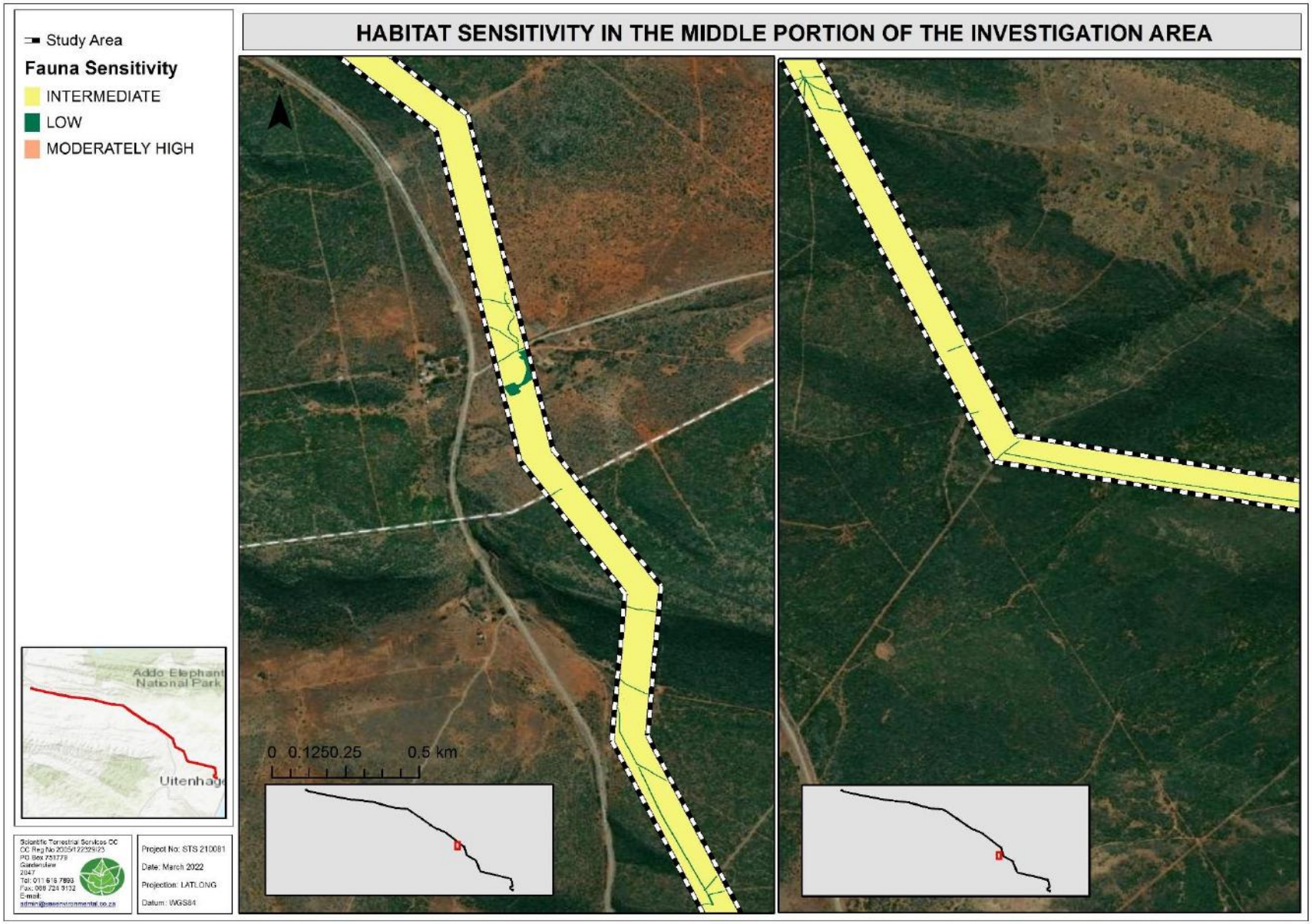


Figure 25: Faunal habitat sensitivities associated with the investigation area.

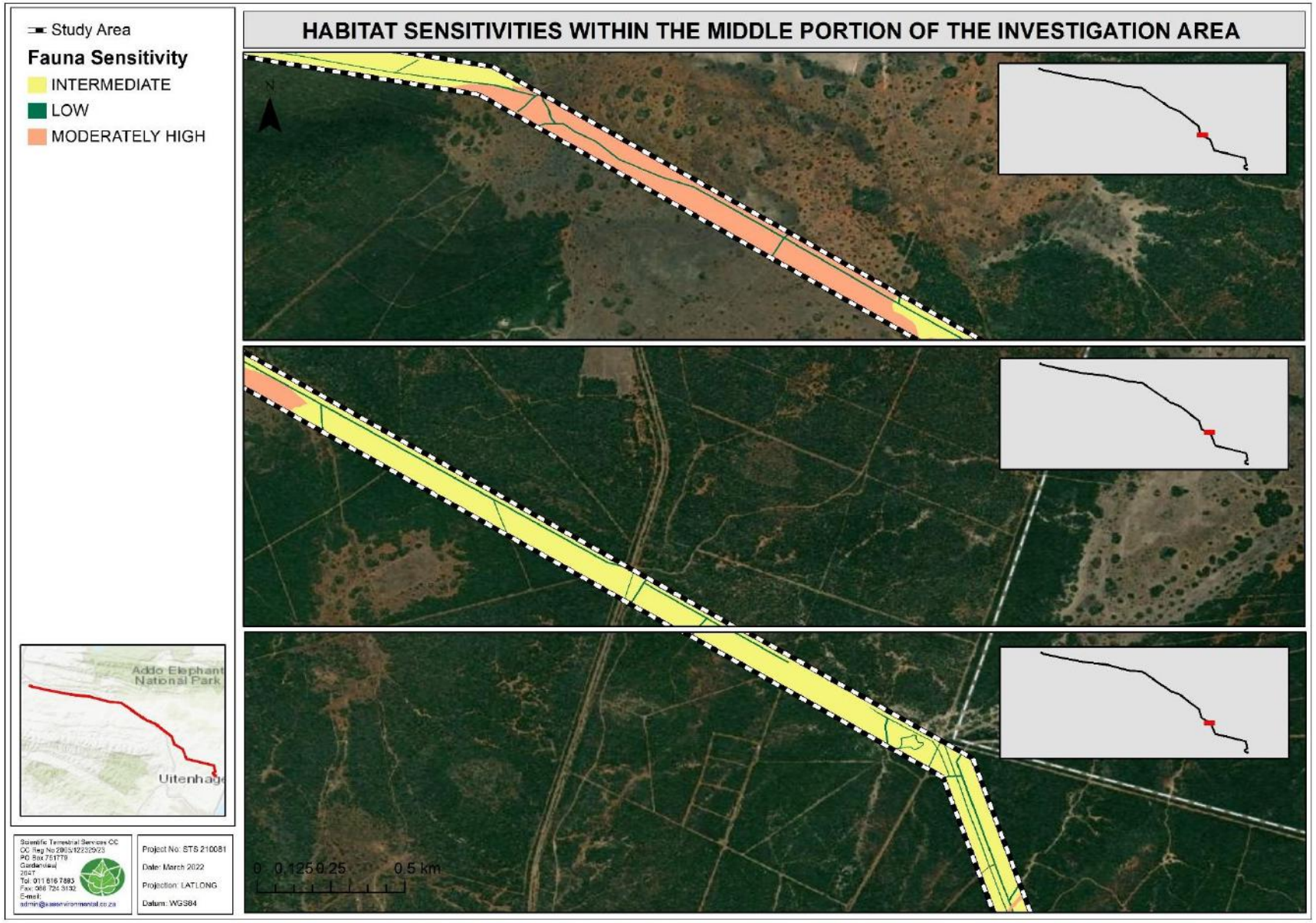


Figure 26: Faunal habitat sensitivities associated with the investigation area.

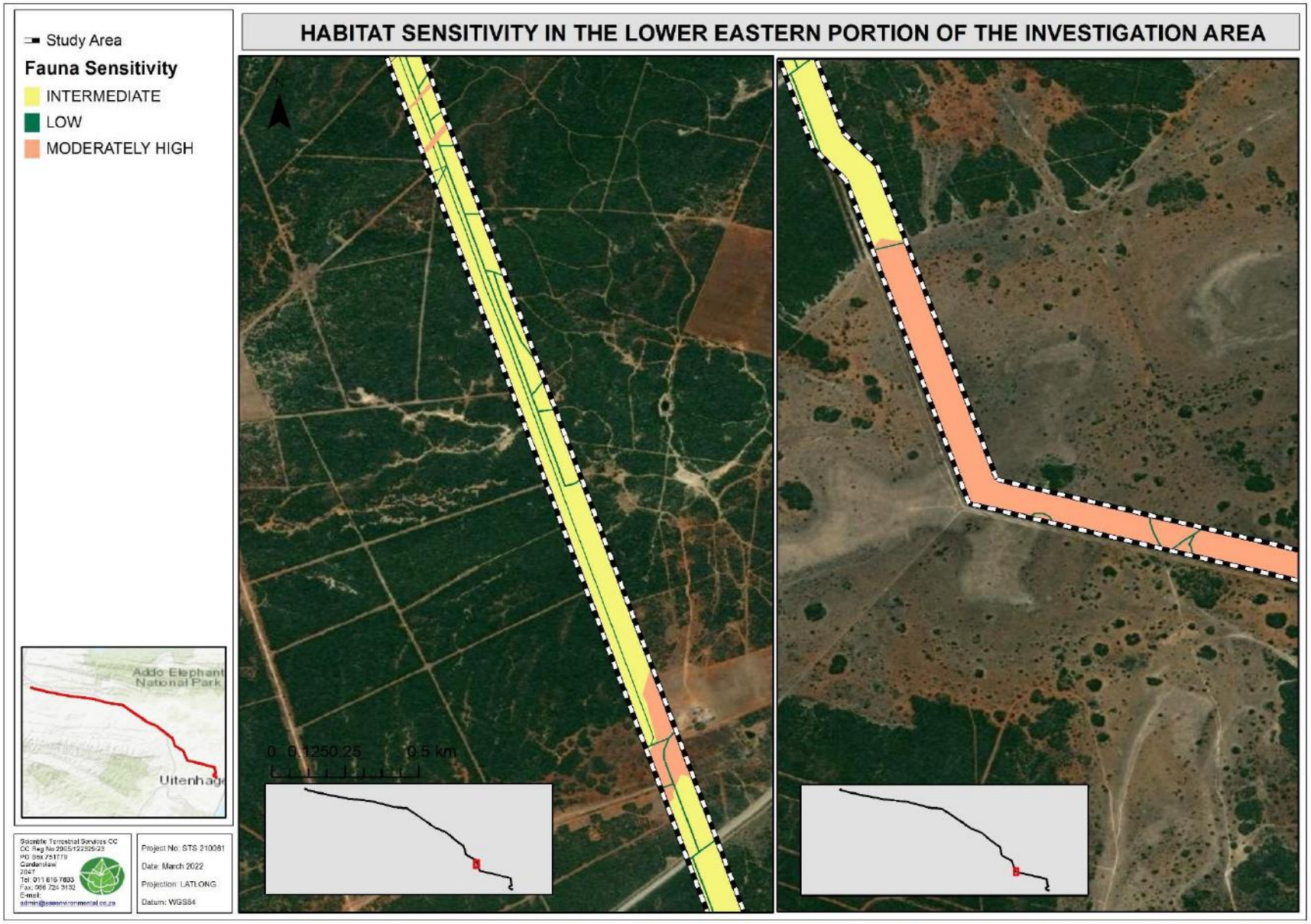


Figure 27: Faunal habitat sensitivities associated with the investigation area.

Figure 28: Faunal habitat sensitivities associated with the investigation area.

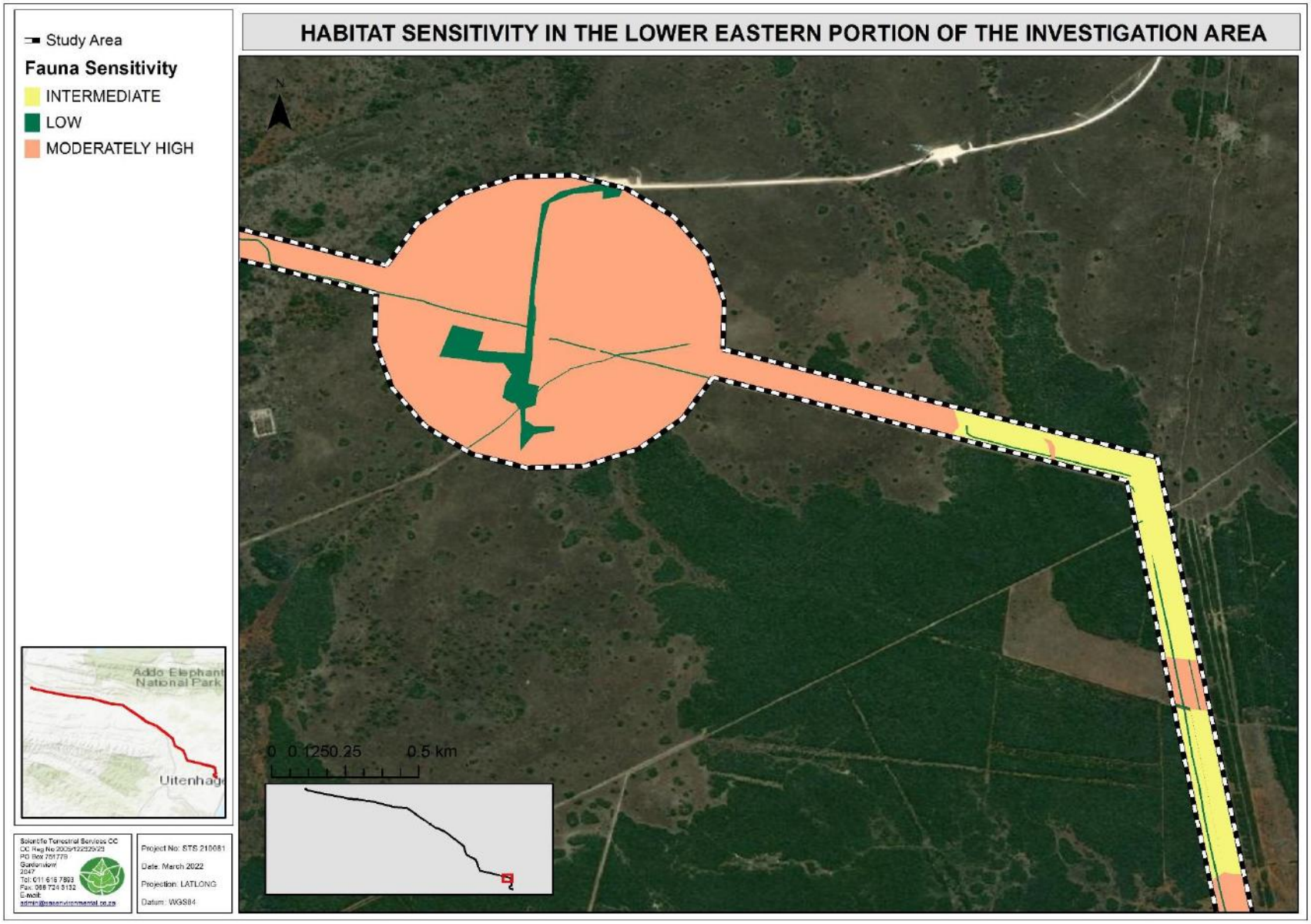


Figure 29: Faunal habitat sensitivities associated with the investigation area.

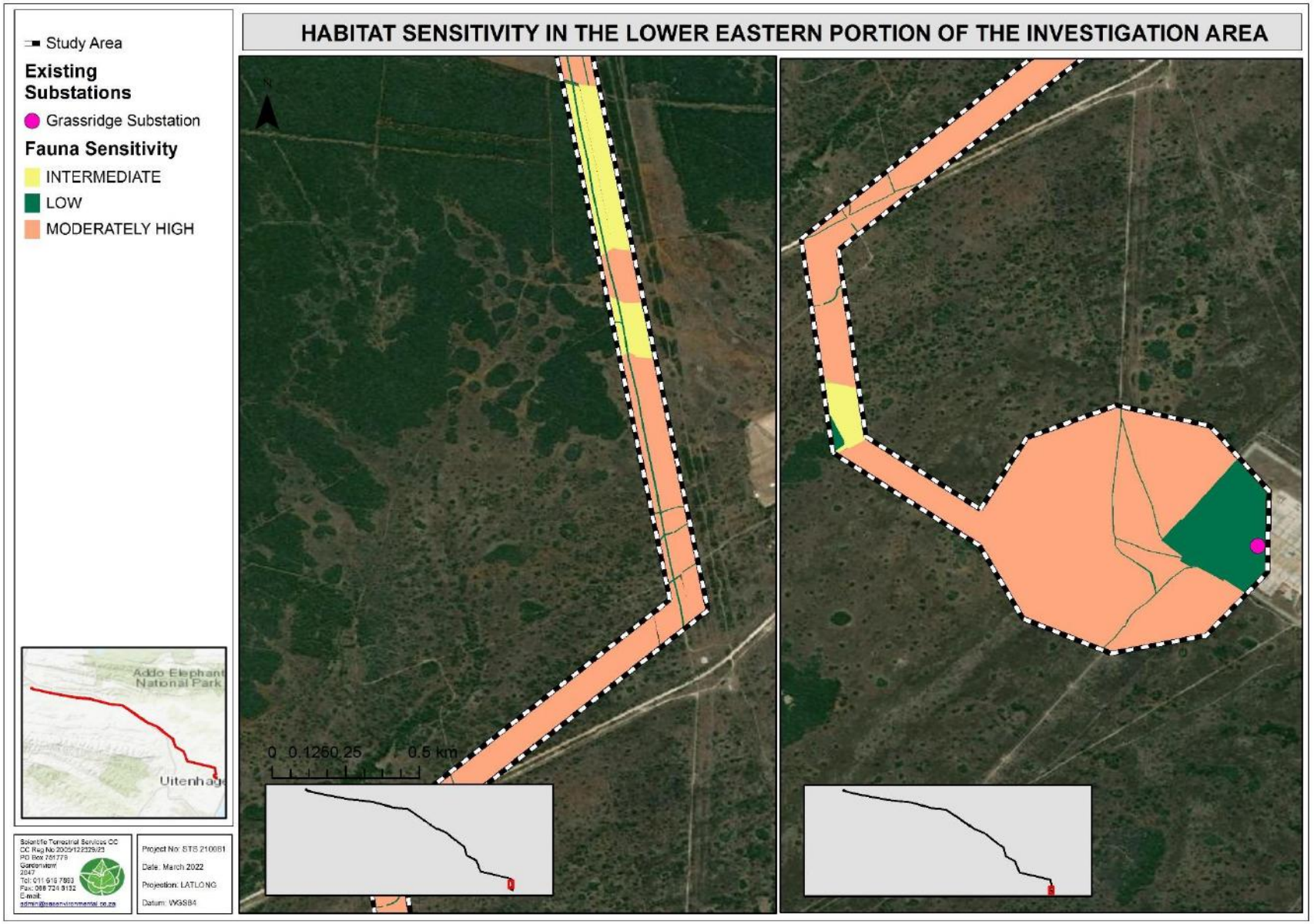


Figure 30: Faunal habitat sensitivities associated with the investigation area.

5 IMPACT ASSESSMENT

The sections below provide the significance of perceived impacts arising from the proposed development within the investigation area. An impact discussion and assessment of all potential construction and operational phase impacts are provided in Section 5.1 and 5.2. All mitigatory measures required to minimise the perceived impacts are presented in Appendix C along with the detailed impact tables for each impact.

5.1 Faunal Impact Assessment Results

The below impact summary table (Table 5) indicates the perceived risks to the faunal ecology associated with the construction and operational phase relating to the proposed OHPL. The table also provides the findings of the impact assessment undertaken with reference to the perceived impacts prior to the implementation of mitigation measures and following the implementation of mitigation measures. The mitigated results of the impact assessment have been calculated on the premise that all mitigation measures as stipulated in this report are adhered to and implemented. Should such actions not be adhered to, it is highly likely that post-mitigation impact scores will increase.

For a full list and description of the impacts as well pertinent mitigation measures, please refer to Appendix C of this report.

Table 5: Construction and Operational Phase impacts on the faunal habitat, diversity, and SCC associated with the OHPL.

Ref:	Project phase	Impact	Without mitigation						With mitigation					
			Nature	Duration	Extent	Intensity	Probability	Significance	Nature	Duration	Extent	Intensity	Probability	Significance
1	Construction	Loss of Habitat and Faunal Species Diversity - Sundays Arid Thicket Habitat	Negative	Short term	Local	Very low	Certain / definite	Minor - negative	Negative	Short term	Very limited	Very low	Certain / definite	Minor - negative
2	Construction	Loss of Habitat and Faunal Species Diversity - Sundays Valley Thicket Habitat	Negative	Short term	Local	Very low	Certain / definite	Minor - negative	Negative	Short term	Very limited	Very low	Certain / definite	Minor - negative
3	Construction	Loss of Habitat and Faunal Species Diversity - Grassridge Bonteveld Habitat	Negative	Short term	Limited	Very low	Certain / definite	Minor - negative	Negative	Short term	Very limited	Very low	Certain / definite	Minor - negative
4	Construction	Loss of Habitat and Faunal Species Diversity - Freshwater Habitat	Negative	Brief	Limited	Very low	Unlikely	Negligible - negative	Negative	Imme diate	Very limited	Negligible	Rare / improbable	Negligible - negative
5	Construction	Loss of Habitat and Faunal Species Diversity - Transformed Habitat	Negative	Brief	Limited	Very low	Unlikely	Negligible - negative	Negative	Brief	Very limited	Negligible	Rare / improbable	Negligible - negative
6	Construction	Loss of SCC - Sundays Arid Thicket Habitat	Negative	Brief	Limited	Moderate	Unlikely	Negligible - negative	Negative	Brief	Very limited	Low	Unlikely	Negligible - negative
7	Construction	Loss of SCC - Sundays Valley Thicket Habitat	Negative	Short term	Limited	Low	Unlikely	Negligible - negative	Negative	Brief	Very limited	Very low	Unlikely	Negligible - negative
8	Construction	Loss of SCC - Grassridge Bonteveld Habitat	Negative	Short term	Limited	Moderate	Unlikely	Negligible - negative	Negative	Brief	Very limited	Low	Unlikely	Negligible - negative
9	Construction	Loss of SCC - Freshwater Habitat	Negative	Brief	Limited	Very low	Rare / improbable	Negligible - negative	Negative	Brief	Very limited	Negligible	Highly unlikely / none	Negligible - negative
10	Operation	Habitat Degradation and Altered Faunal Species Diversity - All Habitats	Negative	On-going	Limited	Low	Probable	Minor - negative	Negative	Long term	Limited	Very low	Unlikely	Negligible - negative
11	Operation	Impact on Faunal SCC - All Habitats	Negative	Perma nent	Limited	Very low	Unlikely	Negligible - negative	Negative	On-going	Limited	Negligible	Rare / improbable	Negligible - negative

5.2 Impact Discussion

Impact significance prior to mitigation on the receiving faunal environment (habitat, species and SCC) ranges from minor-negative to negligible-negative. Following the implementation of mitigation measures and sound environmental management, impact significance can be reduced. In some instances, the overall impact significance does not decrease, however it must be noted that the extent of the perceived impact does decrease. Disturbances to the environment, such as AIP proliferation, soil erosion in cleared areas and extensive vegetation cutting during the operational phase may continue to impact on faunal ecology and habitat availability.

Should habitat clearing and degradation extend beyond the footprint areas, it will negatively impact faunal communities on a greater spatial scale, leading to further declines in diversity and increased cumulative impacts. It is imperative that the area of impact and overall impact significance be kept as small as possible by ensuring that all proposed pylon footprints ae kept as small as possible, notably in the more sensitive habitat units.

5.2.1 Impact on Faunal Habitat and Diversity

The installation of the OHPL and the service road will result in the loss of habitat, impacting on faunal species diversity and abundances in the footprint areas as well as the areas adjacent these sites. Provided that only the pylon footprint areas are cleared of vegetation and that where possible, already existing roads are used for access, impacts can be kept low, with minor to negligible significance impacts. Faunal species will likely be displaced out of the disturbed areas during the construction phase, taking up residence in the neighbouring habitats. Whilst this may lead to a risk of increased competition for space and resources, the extended drought period has led to a notable decrease in species abundances and as such, it is unlikely that displaced species will encounter high levels of inter or intra-specific competition at this point in time. Overall, the construction and operation of the OHPL is not expected to have detrimental impacts to the available habitat levels nor species diversity.

5.2.2 Impacts on Faunal SCC

Many species are considered as SCC due to habitat loss, fragmentation and increased persecution. Although the construction of the OHPL will lead to clearance of vegetation for the pylons, the individual footprints are not expected to be extensive, and given that they are spaced far apart, are unlikely to result in any habitat fragmentation and thus not impact on faunal SCC movement. Provided that the footprint areas are rehabilitated and that the

herbaceous layer and short shrubs are allowed to propagate under the pylons, the overall long term loss of habitat for SCC is expected to be minimal. Any displaced SCC during the construction phase will likely be able to either recolonise or make use of the footprint areas once they are rehabilitated / vegetation regrowth has occurred. Where vegetation clearance occurs in dense thicket areas (preferred by some SCC), it is unlikely that these SCC will be able to make full use of the footprints post clearing, however, these cleared areas will likely be used periodically for foraging. Overall, provided that mitigation measures (see Appendix C) are implemented, the construction and operation of the OHPL is not expected to have a significant impact on faunal SCC in the region.

5.2.3 Probable Residual Impacts

Even with extensive mitigation, residual impacts on the receiving faunal ecological environment remain possible. Disturbed areas are highly unlikely to be rehabilitated back to the same ecological functioning level as prior to disturbances. Long term avoidance of erosion and AIP control may further lead to habitat loss in the surrounding areas, further impacting on faunal species in the local area.

6 CONCLUSION

STS was appointed by Red Rocket (Pty) Ltd to conduct a terrestrial biodiversity assessment as part of the EA process for the proposed OHPL.

During the field assessment five broad habitat units were identified, namely the Grassridge Bonteveld Habitat, the Sundays Valley Thicket Habitat, the Sundays Arid Thicket habitat, Freshwater habitat and the Transformed areas. These habitats have all been subjected to varying levels of disturbance, most notably the Transformed areas. Much of the proposed OHPL route traverses farmlands utilised for livestock and game farming. The extended drought combined with these farming practices has in some areas led to notable overgrazing and a loss of herbaceous layer, though, with the good rains received the herbaceous layer is starting to recover.

Several faunal SCC are associated with the habitats but given the narrow width of the proposed OHPL servitude and the even smaller relative disturbance footprint (interspersed pylons), it is unlikely that any of these SCC will be wholly reliant on the small areas that will be impacted upon as a result of construction activities. Any SCC that happen to be located within a pylon footprint area will likely self-relocate to adjacent areas or will be relocated as part of a rescue and relocation activities.

Impact significance prior to mitigation on the receiving faunal environment (habitat, species and SCC) ranges from minor-negative to negligible-negative. Following the implementation of mitigation measures and sound environmental management, impact significance can be reduced. In some instances, the overall impact significance does not decrease, however it must be noted that the extent of the perceived impact does decrease.

The objective of this study was to provide sufficient information on the faunal ecology of the area, together with other studies on the physical and socio-cultural environment, in order for the Environmental Assessment Practitioner (EAP) and the relevant authorities to apply the principles of Integrated Environmental Management (IEM) and the concept of sustainable development. The needs for conservation as well as the risks to other spheres of the physical and socio-cultural environment need to be compared and considered along with the need to ensure economic development of the country. This study provides the relevant information required in order to implement IEM and to ensure that the best long-term use of the ecological resources in the area of assessment will be made in support of the principle of sustainable development.

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APPENDIX A: Faunal Method of Assessment

It is important to note that due to the nature and habits of fauna, varied stages of life cycles, seasonal and temporal fluctuations along with other external factors, it is unlikely that all faunal species will have been recorded during the site assessment. The presence of anthropogenic activities near the investigation area may have an impact on faunal behaviour and in turn the rate of observations. In order to increase overall observation time within the investigation area, as well as increasing the likelihood of observing shy and hesitant species, Sherman and camera traps were strategically placed within the investigation area. Sherman traps were used to increase the likelihood of capturing and observing small mammal species, notably small nocturnal mammals.

Mammals

Mammal species were recorded during the field assessment with the use of visual identification, spoor, calls and dung. Specific attention was given to mammal SCC listed on a regional and national level, as well as those identified by the International Union for the Conservation of Nature (IUCN).

Reptiles

Reptiles were identified during the field survey. Suitable applicable habitat areas (rocky outcrops and fallen dead trees) were inspected, and all reptiles encountered were identified. The data gathered during the assessment along with the habitat analysis provided an accurate indication of which reptile species are likely to occur on the investigation area. Specific attention was given to reptile SCC listed on a regional and national level, as well as those identified by the International Union for the Conservation of Nature (IUCN).

Amphibians

Identifying amphibian species is done by the use of direct visual identification along with call identification technique. Amphibian species flourish in and around wetland, riparian and moist grassland areas. It is unlikely that all amphibian species will have been recorded during the site assessment, due to their cryptic nature and habits, varied stages of life cycles and seasonal and temporal fluctuations within the environment. The data gathered during the assessment along with the habitat analysis provided an accurate indication of which amphibian species are likely to occur within the investigation area as well as the surrounding area. Specific attention was given to amphibian SCC listed on a regional and national level, as well as those identified by the International Union for the Conservation of Nature (IUCN).

Invertebrates

Whilst conducting transects through the investigation area, all insect species visually observed were identified, and where possible photographs taken. Pitfall traps was also utilised during the site assessment and all insect species captured identified, photographed and set free.

It must be noted however that due to the cryptic nature and habits of insects, varied stages of life cycles and seasonal and temporal fluctuations within the environment, it is unlikely that all insect species will have been recorded during the site assessment period. Nevertheless, the data gathered during the assessment along with the habitat analysis provided an accurate indication of which species are likely to occur in the investigation area at the time of the survey. Specific attention was given to insect SCC listed on a regional and national level, as well as those identified by the International Union for the Conservation of Nature (IUCN).

Arachnids

Suitable applicable habitat areas (rocky outcrops, sandy areas and fallen dead trees) where spiders and scorpions are likely to reside were searched. Rocks were overturned and inspected for signs of these species. Specific attention was paid to searching for Mygalomorphae arachnids (Trapdoor and Baboon spiders) as well as potential SCC scorpions within the investigation area.

Faunal Species of Conservation Concern Assessment

The Probability of Occurrence (POC) for each faunal SCC was determined using the following four parameters:

- Species distribution;
- Habitat availability;
- Food availability; and
- Habitat disturbance.

The Probability of Occurrence (POC) for each faunal SCC is described:

- "**Confirmed'**: if observed during the survey;
- "**High**": if within the species' known distribution range and suitable habitat is available;
- "**Medium**": if either within the known distribution range of the species or if suitable habitat is present; or
- "**Low**": if the habitat is not suitable and falls outside the distribution range of the species.

The accuracy of the POC is based on the available knowledge about the species in question, with many of the species lacking in-depth habitat research.

Faunal Habitat Sensitivity

The sensitivity of the investigation area for each faunal class (i.e. mammals, birds, reptiles, amphibians and invertebrates) was determined by calculating the mean of five different parameters which influence each faunal class and provide an indication of the overall faunal ecological integrity, importance and sensitivity of the investigation area for each class. Each of the following parameters are subjectively rated on a scale of 1 to 5 (1 = lowest and 5 = highest):

- **Faunal SCC:** The confirmed presence or potential for faunal SCC or any other significant species, such as endemics, to occur within the habitat unit;
- **Habitat Availability:** The presence of suitable habitat for each class;
- **Food Availability:** The availability of food within the investigation area for each faunal class;
- **Faunal Diversity:** The recorded faunal diversity compared to a suitable reference condition such as surrounding natural areas or available faunal databases; and
- **Habitat Integrity:** The degree to which the habitat is transformed based on observed disturbances which may affect habitat integrity.

Each of these values contribute equally to the mean score, which determines the suitability and sensitivity of the investigation area for each faunal class. A conservation and land-use objective is also assigned to each sensitivity class which aims to guide the responsible and sustainable utilization of the investigation area in relation to each faunal class. The different classes and land-use objectives are presented in the table below:

Table A1: Faunal habitat sensitivity rankings and associated land-use objectives.

Score	Rating significance	Conservation objective
1.0 < 1.5	Low	Optimise development potential.
≥1.5 <2.5	Moderately low	Optimise development potential while improving biodiversity integrity of surrounding natural habitat and managing edge effects.
≥2.5 <3.5	Intermediate	Preserve and enhance biodiversity of the habitat unit ar surrounds while optimising development potential.
≥3.5<4.5	Moderately high	Preserve and enhance the biodiversity of the habitat un limit development and disturbance.
≥4.5 ≤ 5.0	High	Preserve and enhance the biodiversity of the habitat unit, no-go alternative must be considered.

APPENDIX B: Faunal SCC

The tables below list the faunal Species of Conservation Concern for the investigation area:

Table B1: Threatened large- to medium-sized mammals in the Eastern Cape Province (Smithers, 1986).

Scientific Name	Common Name	Conservation Status (EC SoER, 2004)
Lycaon pictus	Wild dog	EN
Hyaena brunnea	Brown Hyaena	Rare
Proteles cristatus	Aardwolf	Rare
Felis nigripes	Black-Footed Cat	Rare
Panthera pardus	Leopard	Rare
Leptailurus serval	Serval	Rare
Philantomba monticola	Blue Duiker	Rare
Mellivora capensis	Honey Badger	VU
Felis nigripes nigripes	Black-Footed Cat	Rare
Felis lybica	Wild Cat	VU
Orycteropus afer	Aardvark	VU
Equus zebra	Cape Mountain Zebra	VU
Diceros bicornis	Black Rhino	VU
Ourebia ourebi	Oribi	VU
Manis temminckii	Pangolin	VU

VU= Vulnerable; EN = Rare

Table B2: Threatened and endemic reptiles and frogs in the Eastern Cape (Burger, pers comm. 2003).

	Species	Threatened	EC Endemic	Distribution
AMPHIBIANS	*Heleophryne hewitti*	CR	X	Longmore Forest, only four rivers in the Elandsberg range
	Anhydrophryne rattrayi	EN	X	Amatola forests, e.g. Katberg, Stutterheim, Keiskammahoek
	Bufo amatolicus	EN	X	Winterberg and Amatola mountains, Katberg to Keiskammahoek
	Leptopelis xenodactylus	EN		
	Natalobatrachus bonebergi	EN		
	Afrixalus spinifrons	EN		
	Bufo pardalis		X	Wide distribution from Eastern seaboard from Port Elizabeth to East London and inland to Amatola region
REPTILES	*Bitis albanica*	RDB candidate	X	Restricted to Algoa Bay
	Acontias meleagris orientalis		X	Sundays River valley and Cradock
	Acontias pusilus		X	Border EC KZN; Kokstad
	Acontias percivali tasmani		X	Algoa basin
	Scelotes anguinius		X	Algoa basin
	Nucras taeniolata			Algoa basin and Albany centre
	Tropidosaura montana subsp *rangeri*		X	From Amatola mountains as S to Albany region

	Tetradactylus africanus fitzsimonsi	RDB candidate	X	Algoa basin
	Cordylus tasmani		X	Algoa basin
	Bradypodion. caffrum		X	Wild Coast
	B. contanicum		X	Centani
	B. taeniabroncum	Possibly EN	X	Van Stadens Berg and near Kareedouw
	B. ventrali		X	Coast to Karoo and Thicket
	Afroedura amatolica		X	Amatole and Katberg mountains
	Afroedura karroica		X	Inland mountains in Karoo; Tarkastad to Graaff-Reinett regions
	Afroedura tembulica		X	Mountains around Queenstown
	Afroedura sp nova		X	Kouga Mountains and Cockscomb
	Cryptactites peringueyi	RDB candidate	X	From Chelsea Point near P.E., east to Kromme estuary
	Goggia essexi		X	Upland areas in Albany region, Suurberg to Great Fish River

Table B3: TOPS list of faunal species (2007) that require a permit, should they need to be captured and transported for relocation purposes.

Scientific Name	Common Name
CRITICALLY ENDANGERED SPECIES	
REPTILIA	
Caretta	Loggerhead Sea Turtle
Dermochelys coriacea	Leatherback Sea Turtle
Eretmochelys imbricate	Hawksbill Sea Turtle
AVES	
Grus carunculatus	Wattled Crane
Hirundo atrocaerulea	Blue Swallow
Neophron percnopterus	Egyptian Vulture
Poicephalus robustus	Cape Parrot
MAMMALIA	
Bunolagus monticularis	Riverine Rabbit
Chrysospalax	Rough-haired Golden Mole
ENDANGERED SPECIES	
REPTILIA	
Chelonia mydas	Green Turtle
Cordylus giganteus	Giant Girdled Lizard
Lepidochelys olivacea	Olive Ridley Turtle
Psammobates geometricus	Geometric Tortoise
AVIFAUNA	
Anthropoides paradiseus	Blue Crane
Balearica regulorum	Grey Crowned Crane
Ephippiorhynchus senegalensis	Saddle-billed Stork
Gypaetus barbatus	Bearded Vulture
Gyps africanus	White-backed Vulture
Gyps coprotheres	Cape Vulture
Necrosyrtes	Hooded Vulture
Pelecanus rufescens	Pink-backed Pelican
Scotopelia peli	Pel's Fishing Owl
Torgos tracheliotus	Lappet-faced Vulture
MAMMALIA	
Amblysomus robustus	Robust Golden Mole
Damaliscus tunatus	Tsessebe

Scientific Name	Common Name
Diceros bicornis	Black Rhinoceros
Equus zebra	Mountain Zebra
Lycaon pictus	African Wild Dog
Neamblysomus gunningi	Gunning's Golden Mole
Ourebia ourebi	Oribi
Paraxerus palliatus	Red Squirrel
Petrodromus tetradactylus	Four-toed Elephant-shrew
INVERTEBRATA	
Colophon spp - species	Stag Beetles
VULNERABLE SPECIES	
AVES	
Trigonoceps occipitalis	White-headed Vulture
Aquila rapax	Tawny Eagle
Ardeotis kori	Kori Bustard
Ciconia nigra	Black Stork
Circaetus fasciolatus	Southern Banded Snake Eagle
Eupodotis caerulescens	Blue Korhaan
Falco fasciinucha	Falcon
Falco naumanni	Lesser Kestrel
Falco peregrinus	Peregrine Falcon
Geronticus calvus	Bald Ibis
Neotis ludwidii	Ludwig's Bustard
Polemaetus bellicosus	Martial Eagle
Terathopius ecaudatus	Bateleur
Tyto capensis	Grass Owl
MAMMALIA	
Acinonyx jubatus	Cheetah
Chrysospalax trevelyani	Giant Golden Mole
Cricetomys gambianus	Giant Rat
Damaliscus pyrgorgus pygargus	Bontebok
Dendrohyrax arboreus	Tree Hyrax
Hippotragus equinus	Roan Antelope
Smutsia temminckii	Pangolin
Neamblysomus julianae	Juliana's Golden Mole
Neotragus moschatus	Suni
Panthera leo	Lion
Panthera pardus	Leopard
Philantomba monticola	Blue Duiker
INVERTEBRATA	
Peripatopsis alba	White Cave Velvet Worm
PROTECTED SPECIES	
AMPHIBIA	
Pyxicephalus adspersus	Giant Bullfrog
Pyxicephalus edulis	African Lesser Bullfrog
REPTILIA	
Bitis gabonica	Gaboon Adder
Bitis schneideri	Namaqua Dwarf Adder
Bradypodion taeniabronchum	Smith's Dwarf Chameleon
Cordylus cataphractus	Girdled Lizard
Crocodylus niloticus	Nile crocodile
Python natalensis	African Rock Python
AVES	
Bucowus leadeateri	Southern Ground-Hornbill
Circus ranivorus	African Marsh Harrier

Scientific Name	Common Name
Neotis denhami	Denham's Bustard
Spheniscus	Jackass Penguin
MAMMALIA	
Atelerix frontalis	South African Hedgehog
Ceratotherium simum	White Rhinoceros
Connochaetes	Black Wildebeest
Crocuta crocuta	Spotted Hyaena
Felis nigripes	Black-footed Cat
Parahyaena brunnea	Brown Hyaena
Leptailurus serval	Serval
Loxodonta africana	African elephant
Lutra maculicollis	Spotted-necked Otter
Millivora capensis	Honey Badger
Raphicerus sharpei	Sharpe's Grysbok
Redunca	Reedbuck
Vulpes chama	Cape Fox
INVERTEBRATA	
Aloeides clarki	Coega Copper Butterfly
Ceratogyrus spp - All species	Horned Baboon Spiders
Echinodiscus bisperforatus	Pansy Shell
Dromica spp - All species	Tiger Beetles
Graphipterus assimilis	Velvet Ground Beetle
Hadogenes spp -species	Flat Rock Scorpions
Haliotis midae	South African Abalone
Harpactira spp - All species	Common Baboon Spiders
Ichnestoma - Aspecies	Fruit Chafer Beetles
Manticora spp - Aspecies	Monster Tiger Beetles
Megacephala asperata	Tiger Beetle
Megacephala regalis	Tiger Beetle
Nigidius auriculatus	Stag beetle
Oonotus adspersus	Stag Beetle
Oonotus interioris	Stag Beetle
Oonotus rex	Stag Beetle
Oonotus sericeus	Stag Beetle
Opisthacanthus spp - All species	Creeping Scorpions
Opistophthalmus spp - All species	Burrowing Scorpions
Platychile pallida	Tiger Beetle
Prosopocoilus petitclerci	Stag Beetle
Prothyma guttipennis	Tiger Beetle
Pterinochilus spp - All species	Golden Baboon Spiders

DD = Data Deficient

APPENDIX C: Impact Assessment Results

This section presents the detailed impact assessment table per habitat unit and per impact relating to the impact summary table presented in Section 5.1 (Table 5). Impacts were assessed for the construction and the operational phase of the powerline. Impacts focussed on the loss of faunal habitat and species diversity as well as faunal SCC. The tables which follow detail the individual impacts, the mitigation measure and the cumulative impacts associated with the impact.

Table D1: Loss of Habitat and Faunal Species Diversity - Sundays Arid Thicket Habitat.

Ref:	1			
Project phase	**Construction**			
Impact	**Loss of Habitat and Faunal Species Diversity - Sundays Arid Thicket Habitat**			
Description of impact	**Clearance of vegetation for the pylon footprints and access road leading to habitat loss, decreased food resources and displacement of faunal species from these areas.**			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	**Footprint areas (Pylons and servitude road) are to remain as small as possible with only those are necessary being cleared. Only tall trees located under the powerline are to be cut back, but not totally removed. As much herbaceous and shrubland vegetation as possible must remain under the powerlines. Small reptile and arachnid species should they not self-relocate must be carefully moved to habitat outside of the disturbance footprint.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	impact will last between 1 and 5 years	Short term	impact will last between 1 and 5 years
Extent	Local	Extending across the site and to nearby settlements	Very limited	Limited to specific isolated parts of the site
Intensity	Very low	Natural and/ or social functions and/ or processes are slightly altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	Given the decreased sensitivity of the habitat unit and the relatively small footprint of the powerline and the access road, the impacts will lead to some habitat loss however this is not considered to be significant or detrimental to habitat provisioning and habitat connectivity in the local area.			
Cumulative impacts	Although the footprints themselves are small in isolation with minimal loss of habitat, across the linear length of the powerline in this habitat unit, these small disturbances add up and equate to a larger loss of habitat if not suitably managed and mitigated.			

Table D2: Loss of Habitat and Faunal Species Diversity - Sundays Valley Thicket Habitat.

Ref:		2		
Project phase	**Construction**			
Impact	**Loss of Habitat and Faunal Species Diversity - Sundays Valley Thicket Habitat**			
Description of impact	**Clearance of vegetation for the pylon footprints and access road leading to habitat loss, decreased food resources and displacement of faunal species from these areas.**			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	**Footprint areas (Pylons and servitude road) are to remain as small as possible with only those are necessary being cleared. Only tall trees located under the powerline are to be cut back, but not totally removed. As much herbaceous and shrubland vegetation as possible must remain under the powerlines. Pylon footprints are to be spaced the maximum allowable distance apart in order to minimise footprints in this habitat unit. Small reptile and arachnid species should they not self-relocate must be carefully moved to habitat outside of the disturbance footprint. Existing roads must be used and as far as possible no new roads constructed.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	impact will last between 1 and 5 years	Short term	impact will last between 1 and 5 years
Extent	Local	Extending across the site and to nearby settlements	Very limited	Limited to specific isolated parts of the site
Intensity	Very low	Natural and/ or social functions and/ or processes are slightly altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	Provided all mitigation measures are implemented and construction activities take placed in an environmentally sound manner, impact significance is likely to be remain minor			
Cumulative impacts	Locally, this vegetation type has been subjected to clearance for roads, farming activities and wind turbines. The further clearance of vegetation for the powerline will add to this loss of habitat in the region, though, this additional loss is considered to be minimal in the larger extent of the landscape.			

Table D3: Loss of Habitat and Faunal Species Diversity - Grassridge Bonteveld Habitat.

Ref:	3			
Project phase	**Construction**			
Impact	**Loss of Habitat and Faunal Species Diversity - Grassridge Bonteveld Habitat**			
Description of impact	**Clearance of vegetation for the pylon footprints and access road leading to habitat loss, decreased food resources and displacement of faunal species from these areas.**			
Mitigatability	Medium	Mitigation exists and will notably reduce significance of impacts		
Potential mitigation	**Footprint areas (Pylons and servitude road) are to remain as small as possible with only those are necessary being cleared. Only tall trees located under the powerline are to be cut back, but not totally removed. As much herbaceous and shrubland vegetation as possible must remain under the powerlines. Pylon footprints are to be spaced the maximum allowable distance apart in order to minimise footprints in this habitat unit. Small reptile and arachnid species should they not self-relocate must be carefully moved to habitat outside of the disturbance footprint. Existing roads must be used and as far as possible no new roads constructed.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	impact will last between 1 and 5 years	Short term	impact will last between 1 and 5 years
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Very low	Natural and/ or social functions and/ or processes are slightly altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Minor - negative**	
Comment on significance	The small footprint areas of the powerline will result in decreased habitat loss which can be suitably managed during the construction period. Provided all mitigation measures are implemented, the overall impact significance will be minor from a faunal perspective.			
Cumulative impacts	Locally, this vegetation type has been subjected to clearance for roads, farming activities, powerlines and wind turbines. The further clearance of vegetation for the powerline will add to this loss of habitat in the region, though, this additional loss is considered to be minimal in the larger extent of the landscape.			

Table D4: Loss of Habitat and Faunal Species Diversity - Freshwater Habitat.

Ref:	4			
Project phase	**Construction**			
Impact	**Loss of Habitat and Faunal Species Diversity - Freshwater Habitat**			
Description of impact	**Clearance of vegetation for the powerline servitude leading to potential displacement of faunal species and habitat alteration. Total vegetation clearance in the Freshwater habitat and zones of regulation is not expected.**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**Avoid placement of pylons and service roads within this habitat unit and the associated zones of regulation. Do not clear any riparian vegetation within the powerline servitude. Where absolutely necessary only trim tall trees, do not cut them down.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Brief	Impact will not last longer than 1 year	Immediate	Impact will self-remedy immediately
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Very low	Natural and/ or social functions and/ or processes are slightly altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Negligible - negative**		**Negligible - negative**	
Comment on significance	Provided mitigation measures are implemented, the construction of the powerline is likely to have limited to negligeable impacts to this habitat unit. No loss of habitat is expected herein and functionality is expected to continue unimpeded.			
Cumulative impacts	Impacts to the freshwater systems in the local area predominantly stem from agricultural activities, with several dams and weirs having been created by farmers. The construction of the powerline is unlikely to further contribute to cumulative impacts on this habitat unit.			

Table D5: Loss of Habitat and Faunal Species Diversity - Freshwater Habitat.

Ref:		5		
Project phase	**Construction**			
Impact	**Loss of Habitat and Faunal Species Diversity - Transformed Habitat**			
Description of impact	**Construction of servitude road and installation of pylons leading to potential AIP proliferation and soil erosion**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**Manage edge effects and Alien Plant proliferation. Manage erosion and footprint creep.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Brief	Impact will not last longer than 1 year	Brief	Impact will not last longer than 1 year
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Very low	Natural and/ or social functions and/ or processes are slightly altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Negligible - negative**		**Negligible - negative**	
Comment on significance	This habitat unit has been notably disturbed, as such, the proposed activities associated with the powerline development will have negligible impacts to the receiving environment herein, provided mitigation is adhered to.			
Cumulative impacts	Cumulatively, the impacts to the transformed habitat are unlikely to be considerable, given the already transformed nature of the habitat.			

Table D6: Loss of SCC - Sundays Arid Thicket Habitat.

Ref:	6			
Project phase	**Construction**			
Impact	**Loss of SCC - Sundays Arid Thicket Habitat**			
Description of impact	**Potential loss of faunal SCC from the affected areas due to habitat degradation and/or loss as well as risk of direct mortalities resulting from collisions with vehicles. Human - wildlife conflict and potential harvesting for wildlife trade during construction activities may also impact on SCC in the affected areas.**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**Vehicles to use designated roads as far as possible. Minimise vegetation clearance to only what is needed. No collection or destruction of faunal species and SCC is to occur. SCC to be relocated outside of disturbance footprint if they do not relocate themselves (Professional help may be required for such).**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Brief	Impact will not last longer than 1 year	Brief	Impact will not last longer than 1 year
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Negligible - negative**		**Negligible - negative**	
Comment on significance	The installation of the powerline is likely to have a negligible impact on faunal SCC in this habitat unit given the limited extent of the impact footprint, the nature of the activities cand the large extent of this habitat unit.			
Cumulative impacts	The cumulative impacts are not expected to be extensive given that there are limited other developments in the region of in association with the powerline that may impact on faunal SCC.			

Table D7: Loss of SCC - Sundays Valley Thicket Habitat.

Ref:	7			
Project phase	**Construction**			
Impact	**Loss of SCC - Sundays Valley Thicket Habitat**			
Description of impact	**Potential loss of faunal SCC from the affected areas due to habitat degradation and/or loss as well as risk of direct mortalities resulting from collisions with vehicles. Human - wildlife conflict and potential harvesting for wildlife trade during construction activities may also impact on SCC in the affected areas.**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**Vehicles to use designated roads as far as possible. Minimise vegetation clearance to only what is needed. No collection or destruction of faunal species and SCC is to occur. SCC to be relocated outside of disturbance footprint if they do not relocate themselves (Professional help may be required for such).**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	impact will last between 1 and 5 years	Brief	Impact will not last longer than 1 year
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Negligible - negative**		**Negligible - negative**	
Comment on significance	Although this habitat unit is likely to host SCC, the small footprint areas of the proposed powerline are unlikely to have a negative impact on these species provided mitigation measures are implemented. Impacts are expected to be isolated and SCC will likely be able to avoid the construction activities.			
Cumulative impacts	Farms roads and the development of wind farms in the area have already led to loss of habitat and may have potentially impacted on faunal SCC in these areas. The construction of the powerline will likely further add to the overall loss of habitat in the local area, though, this is not expected to be significant at present.			

Table D8: Loss of SCC - Grassridge Bonteveld Habitat.

Ref:	8			
Project phase	**Construction**			
Impact	**Loss of SCC - Grassridge Bonteveld Habitat**			
Description of impact	**Potential loss of faunal SCC from the affected areas due to habitat degradation and/or loss as well as risk of direct mortalities resulting from collisions with vehicles. Human - wildlife conflict and potential harvesting for wildlife trade during construction activities may also impact on SCC in the affected areas.**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**Vehicles to use designated roads as far as possible. Minimise vegetation clearance to only what is needed. No collection or destruction of faunal species and SCC is to occur. SCC to be relocated outside of disturbance footprint if they do not relocate themselves (Professional help may be required for such).**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Short term	impact will last between 1 and 5 years	Brief	Impact will not last longer than 1 year
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Moderate	Natural and/ or social functions and/ or processes are moderately altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	**Negligible - negative**		**Negligible - negative**	
Comment on significance	Although this habitat unit is likely to host SCC, the small footprint areas of the proposed powerline are unlikely to have a negative impact on these species provided mitigation measures are implemented. Impacts are expected to be isolated and SCC will likely be able to avoid the construction activities.			
Cumulative impacts	The development of wind farms in the area have already led to loss of habitat and may have potentially impacted on faunal SCC in these areas. The construction of the powerline will likely further add to the overall loss of habitat in the local area, though, this is not expected to be significant at present.			

Table D9: Loss of SCC - Grassridge Bonteveld Habitat.

Ref:	9			
Project phase	**Construction**			
Impact	**Loss of SCC - Freshwater Habitat**			
Description of impact	**Potential loss of faunal SCC from the affected areas due to habitat degradation. Human - wildlife conflict and potential harvesting for wildlife trade during construction activities may also impact on SCC in the affected areas.**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**Vehicles to use designated roads as far as possible. Minimise vegetation clearance to only what is needed. No collection or destruction of faunal species and SCC is to occur. No footprints to encroach upon the freshwater or regulated zones.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Brief	Impact will not last longer than 1 year	Brief	Impact will not last longer than 1 year
Extent	Limited	Limited to the site and its immediate surroundings	Very limited	Limited to specific isolated parts of the site
Intensity	Very low	Natural and/ or social functions and/ or processes are slightly altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere	Highly unlikely / none	Expected never to happen
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Negligible - negative**		**Negligible - negative**	
Comment on significance	The significance of the impact will be negligible provided that all mitigation measures are implemented and that all activities remain outside of the freshwater habitats and the respective zones of influence.			
Cumulative impacts	The cumulative impacts to the freshwater habitat are expected to be minimal provided no development occurs herein.			

Table D10: Habitat Degradation and Altered Faunal Species Diversity - All Habitats.

Ref:	10			
Project phase	**Operation**			
Impact	**Habitat Degradation and Altered Faunal Species Diversity - All Habitats**			
Description of impact	**Maintenance activities and edge effects leading to habitat degradation and decreases faunal species diversity and abundance.**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**Manage alien plant proliferation in disturbed areas and footprints. No catching / hunting of faunal species during operational activities. Manage erosion to ensure further habitat degradation does not occur. Do not clear vegetation unnecessarily under the powerline servitude.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	On-going	Impact will last between 15 and 20 years	Long term	Impact will last between 10 and 15 years
Extent	Limited	Limited to the site and its immediate surroundings	Limited	Limited to the site and its immediate surroundings
Intensity	Low	Natural and/ or social functions and/ or processes are somewhat altered	Very low	Natural and/ or social functions and/ or processes are slightly altered
Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Minor - negative**		**Negligible - negative**	
Comment on significance	Though the direct impacts to the receiving habitats and faunal species will be less intrusive than the construction phase, the duration of the operation phase for the powerline increases the chance that once off impacts may be replicated over many years and therefore, increase impact significance if not managed and mitigated.			
Cumulative impacts	Cumulatively, the extended duration of the operational phase will likely result in increased but manageable cumulative impacts over time.			

Table D11: Loss of SCC - Impact on Faunal SCC - All Habitats.

Ref:	11			
Project phase	**Operation**			
Impact	**Impact on Faunal SCC - All Habitats**			
Description of impact	**Potential loss of faunal SCC from the affected areas due to habitat degradation and/or loss as well as risk of direct mortalities resulting from collisions with vehicles. Human - wildlife conflict and potential harvesting for wildlife trade may also impact on SCC in the affected areas.**			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	**No collection or trapping of faunal SCC. Manage edge effects, habitat degradation and alien plant proliferation.**			
Assessment	**Without mitigation**		**With mitigation**	
Nature	Negative		Negative	
Duration	Permanent	Impact may be permanent, or in excess of 20 years	On-going	Impact will last between 15 and 20 years
Extent	Limited	Limited to the site and its immediate surroundings	Limited	Limited to the site and its immediate surroundings
Intensity	Very low	Natural and/ or social functions and/ or processes are slightly altered	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
Probability	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
Confidence	Medium	Determination is based on common sense and general knowledge	Medium	Determination is based on common sense and general knowledge
Reversibility	High	The affected environmental will be able to recover from the impact	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	Low	The resource is not damaged irreparably or is not scarce	Low	The resource is not damaged irreparably or is not scarce
Significance	**Negligible - negative**		**Negligible - negative**	
Comment on significance	Though the direct impacts to faunal SCC may be possible, the risk of such impacts occurring is expected to be very low in comparison to the construction phase as no further clearing of ground and earth works will occur.			
Cumulative impacts	Provided all edge effects are and potential impacts are managed, the cumulative impacts to SCC are expected to be limited.			

APPENDIX D: Faunal Species List

Table D1: Mammal species or signs thereof recorded during the 2022 field assessment.

Scientific Name	Common Name	National Red Status
Damaliscus pygargus phillipsi	Blesbok	LC
Orycteropus afer	Aardvark	LC
Raphicerus campestris	Steenbok	LC
Otomys sp	Vlei Rat	LC
Sylvicapra grimmia	Grey Duiker	LC
Lepus saxatilis	Scrub Hare	LC
Procavia capensis ssp. *capensis*	Cape Rock Hyrax	LC
Phacochoerus africanus	Common Warthog	LC
Ictonyx striatus	Striped Polecat	LC
Connochaetes gnou	Black Wildebeest	LC
Tragelaphus strepsiceros	Greater Kudu	LC
Cynictis penicillata	Yellow mongoose	LC
Canis mesomelas	Black-backed Jackal	LC
Aepyceros melampus	Impala	LC

LC = Least Concern.

Table D2: Reptiles species or signs thereof recorded during the 2022 field assessment.

Scientific Name	Common Name	National Red Status
Agama aculeata	Common Ground Agama	LC
Pachydactylus mariquensis	Marico Thick-toed Gecko	LC
Chersina angulata	Angulate tortoise	LC
Stigmochelys pardalis	Leopard Tortoise	LC
Karusasaurus polyzonus	Karoo Girdled Lizard	LC
Pedioplanis lineoocellata pulchella	Common Sand Lizard	LC

LC = Least Concern; NL = Not Listed;

Table D3: Amphibians species or signs thereof recorded during the 2022 field assessment.

Scientific Name	Common Name	National Red Listing
Amietophrynus rangeri	Raucous Toad	LC
Tomopterna tandyi	Tandy's Sand Frog	LC

LC = Least Concern

Table D4. Insect species recorded during the 2022 field assessment.

Scientific Name	Common Name	National Red Status
Dromica sp	Tiger beetle	NYBA
Palpares sp	Veld Antlion adult	NYBA
Brephidium metophis	Tinktinkie Pygmy Blue	LC
Julodis sp	Brush Jewel beetle	NYBA
Sympetrum fonscolombii	Red-veined Darter	LC
Acanthacris ruficornis	Garden locust	NYBA
Heteracris	Splendid Grasshoppers	NYBA
Quintilia wealei	Karoo Cicada	NYBA
Acrididae	Short-horned Grasshoppers	NYBA
Psammodes sp	Toktoki Beetles	NYBA
Colotis euippe	Round-winged Orange Tip	LC
Streblognathus sp	Ponerine Ants	NYBA
Eurynotus sp	Darkling beetle	NYBA
Zophosis sp	Frantic Surface Beetles	NYBA

Family Mantidae	Mantids	LC
Platypleura capensis	Cape Orange-wing Cicada	LC
Rhachitopis sp	Grasshopper	LC
Anthia decemguttata	Tenspot Ground Beetle	NYBA

LC = Least Concern; NYBA = Not Yet Been Assessed by the IUCN;

Table D5. Arachnids species recorded during the 2022 field assessment.

Scientific Name	Common Name	National Red Status
Parabuthus planicauda	Drab Thicktail Scorpion	NYBA
Opistophthalmus pictus	Burrowing Scorpion	NYBA
Agriope sp	Garden Orb-web Spider	NYBA

NYBA = Not Yet Been Assessed by the IUCN;