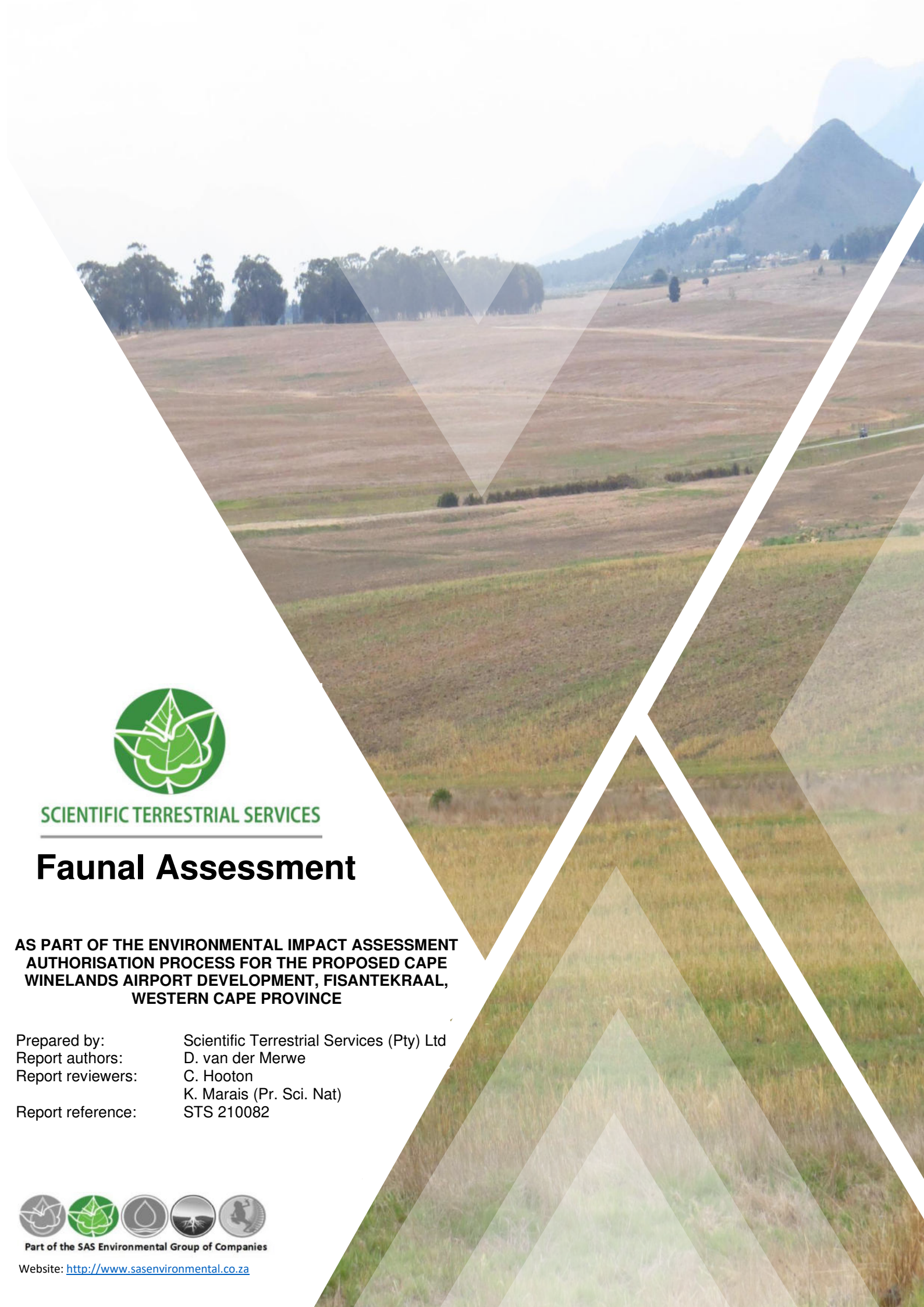
APPENDIX 10

TERRESTRIAL ECOLOGY IMPACT ASSESSMENT PART B

NOVEMBER 2024



SCIENTIFIC TERRESTRIAL SERVICES

Faunal Assessment

AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT AUTHORISATION PROCESS FOR THE PROPOSED CAPE WINELANDS AIRPORT DEVELOPMENT, FISANTEKRAAL, WESTERN CAPE PROVINCE

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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 (fauna) **Part B:** Section 3 (avifauna)
2.3.2	Ecological functioning and ecological processes (e.g., fire, migration, pollination, etc.) that operate within the preferred site;	**Part B**: Section 3 (fauna) **Part B:** Section 3 (avifauna)
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 (fauna) **Part B:** Section 3 (avifauna)
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 – 3.4 (fauna) **Part B:** Section 3.2 – 3.7 (avifauna) **For descriptions on the presence of FEPAs, please refer to the Freshwater Biodiversity Assessment*
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 (fauna) **Part B:** Section 3 (avifauna)
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;* *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 A**: Section 3 (desktop analysis) **Part B**: TBC **Part C:** TBC
2.3.7.2	Terrestrial Ecological Support Areas (ESAs), including:	

No.	SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS	Section in report/Notes
	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
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
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
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 B:** 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 (fauna) **Part B:** Section 1.3 (avifauna)
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 (fauna) **Part B:** Appendix A
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 (fauna) **Part B:** Section 1.3 (avifauna)
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 (fauna) **Part B:** Section 4 (avifauna)
	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:** TBC **Part B:** TBC
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:** TBC **Part C:** TBC
3.1.15	Any conditions to which this statement is subjected.	**Part B:** TBC **Part C:** TBC

No.	SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS	Section in report/Notes
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**

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS

AIP	Alien Invasive Plant
BGIS	Biodiversity Geographic Information Systems
CR	Critically Endangered
DFFE	Department of Forestry, Fisheries and the Environment
EAP	Environmental Assessment Practitioner
EIS	Ecological Importance and Sensitivity
EN	Endangered
EW	Extinct in the Wild
GIS	Geographic Information System
GPS	Global Positioning System
IBA	Important Bird Area
IEM	Integrated Environmental Management
IUCN	International Union for Conservation of Nature and Natural Resources
LC	Least Concern
NA	Not Applicable
NT	Near Threatened
NEMBA	National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)
NYBA	Not yet been assessed
MAMSL	Meters Above Mean Sea Level
P	Protected
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
VU	Vulnerable

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.
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.
ESA (Ecological Support Area)	An ESA provides connectivity and important ecological processes between CBAs and is therefore important in terms of habitat conservation.
Integrity (ecological)	The integrity of an ecosystem refers to its functional completeness, including its components (species) its patterns (distribution) and its processes.
Least Threatened	Least threatened ecosystems are still largely intact.
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.
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.

1. INTRODUCTION

1.1. Background

Scientific Terrestrial Services (Pty) Ltd (STS) was appointed to conduct a Faunal and Avifaunal Assessment for a proposed Cape Winelands Airport on Portions 3, 4 and RE of Farm 474, Joostenbergs Kloof, Portions 23, 10 and the RE of the Farm 724 Joostenbergs Vlakte, and Portion 7 of Farm 942, Kliprug, to determine if any constraints from a faunal or avifaunal perspective may hinder possible future development. This report discusses the findings in relation to portions of the above listed farm portions which henceforth referred to as the "study area". The study area is located approximately 13 km northeast of the suburb of Durbanville, City of Cape Town District Municipality near Fisantekraal, Western Cape Province. More specifically, the study area is situated north of the R312, to the east of R302 and to the west of R304 (Figure 1 and 2).

The study area is approximately 470 hectares (ha) and is located in a predominantly agricultural setting with an existing Airport in the south. Small portions in the south of the study area is tyupied with stables while a portion along the western border has been slightly infringed upon by quarrying activities. (Figures 1 and 2). A few small, highly fragmented pockets of natural vegetation are all that remain within the study area.

The purpose of this report is to define the faunal ecology of the study 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 study area. The objective of this study is:

- To provide inventories of mammal, herpetofaunal and invertebrate species as encountered within the study area;
- To determine and describe habitat types, communities and the ecological state of the study 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 389 of 2013), and the overall potential for such species to occur within the study area;

- To provide detailed information as well as relevant mitigation measures that must be implemented to guide the proposed development activities associated with the study 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.

1.2 Assumptions and Limitations

The following assumptions and limitations are applicable to this report:

- The Faunal Assessment is confined to the study area and does not include the neighboring and adjacent properties. However, the entire study area was considered for this assessment. The immediate surroundings were also included in the desktop analysis of which the results are presented in **Part A: Section 3**;
- 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;
- Distinguishing habitat units is largely dependent of floral species composition and structure, however, habitats herein were based on perceived faunal usage and structure and are deemed suitable for the purposes of this study;
- Due to the nature and habits of most faunal taxa, it is unlikely that all species would have been observed during a field assessment of limited duration (during the dry season). Therefore, site observations were compared with literature studies where necessary;
- Sampling by its nature, means that not all individuals are assessed and identified. Some species and taxa within the study area may therefore have been missed during the assessment; and
- As part of the assessment, a field investigations were undertaken from the 14th to the 16th of February 2022 and 16th and 17 of August 2022 to determine the ecological status of the study area and to “ground-truth” the results of the desktop assessment (as presented in Part A). On-site data was significantly augmented with all available desktop data and specialist experience in the area, and the findings of this assessment are considered to be an accurate reflection of the ecological characteristics associated with the locality of the study area.

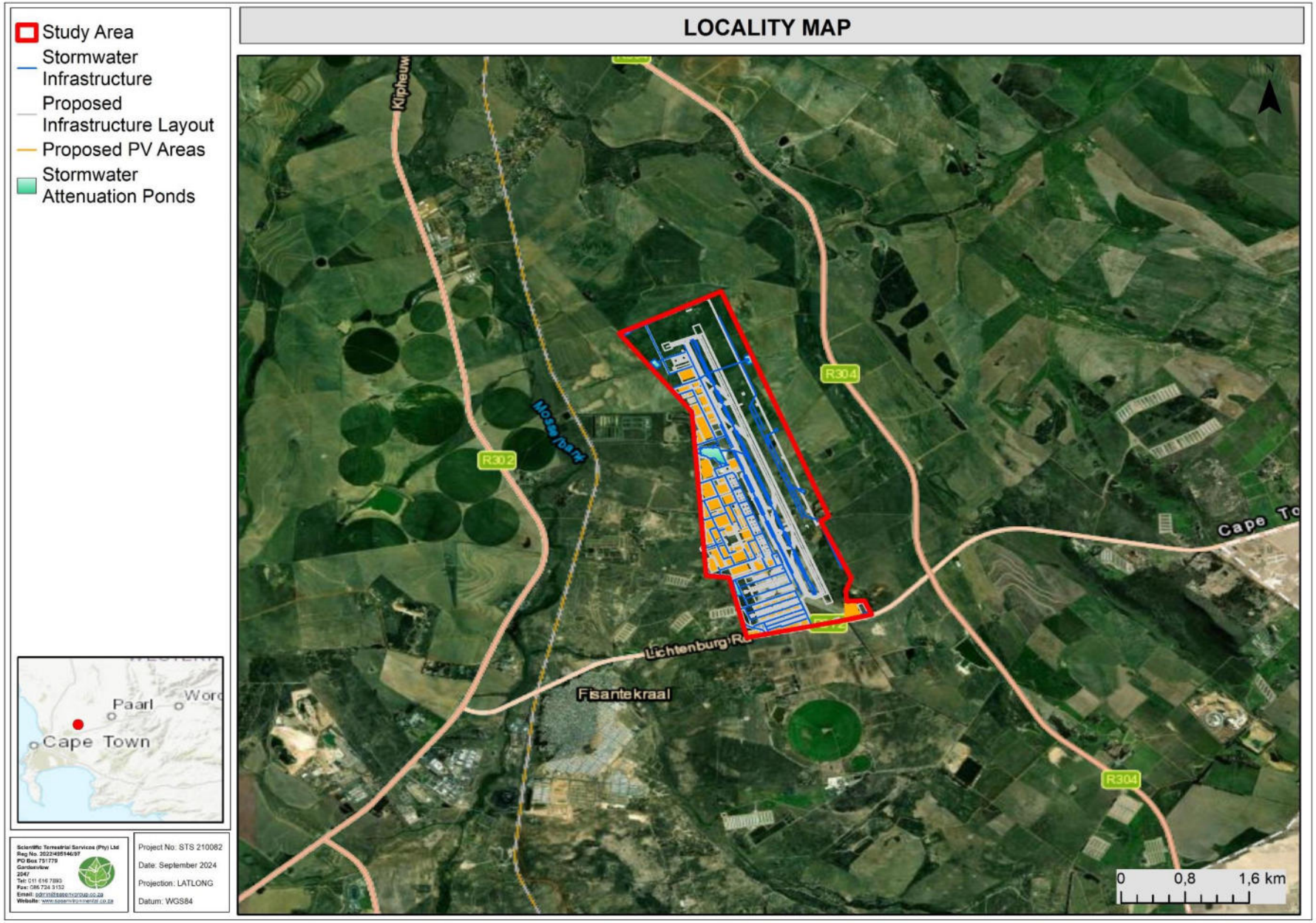


Figure 1: Digital satellite image depicting the study area and study area in relation to surrounding areas.

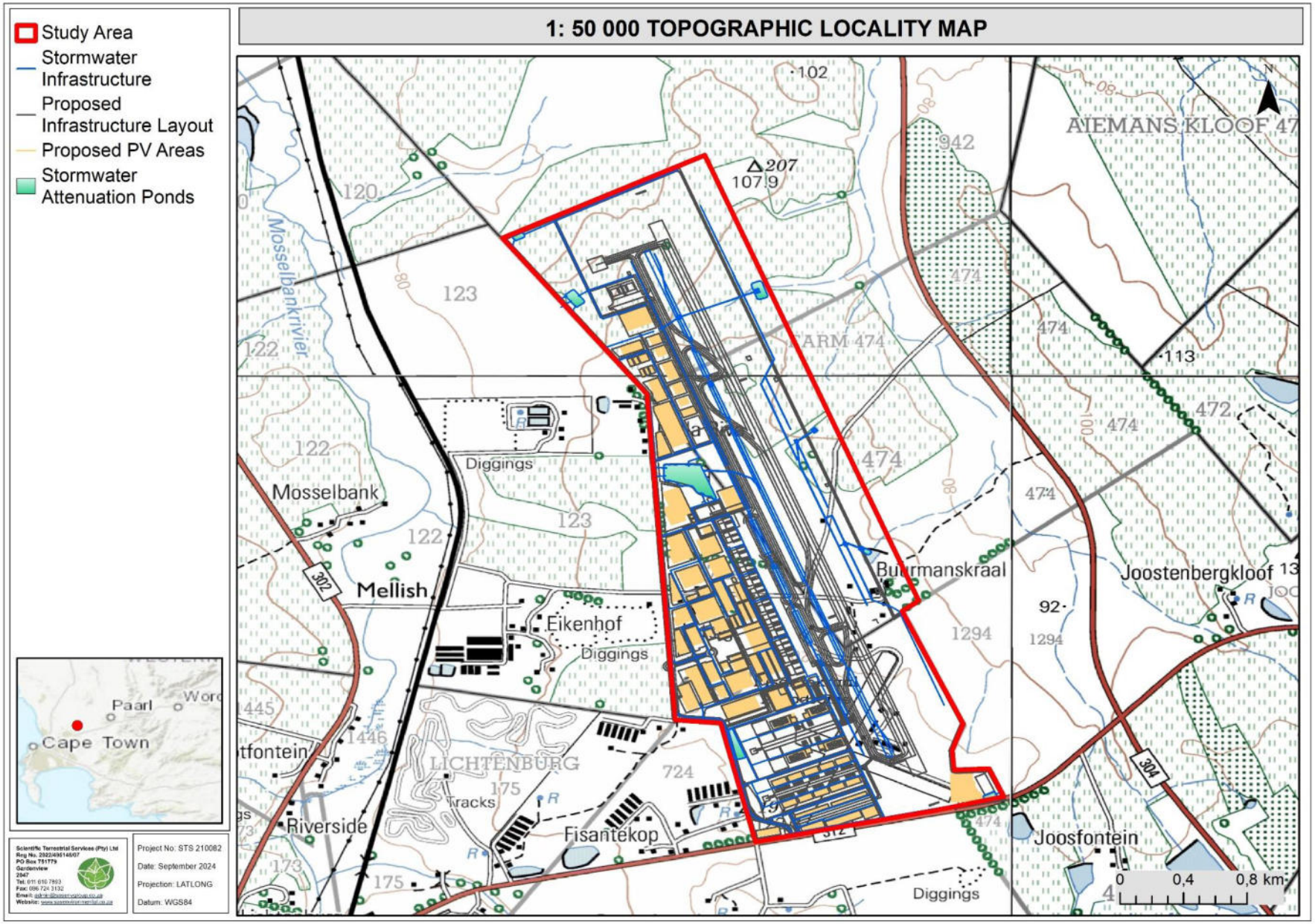


Figure 2: The study area depicted on a 1:50 000 topographical map in relation to the surrounding area.

2. ASSESSMENT APPROACH

The field assessments' were undertaken from the 14th to the 16th of February 2022 (summer season) and 16th and 17th of August 2022 (winter season) to determine the faunal ecological status of the study area. A reconnaissance 'walkabout' was initially undertaken to determine the general habitat types found throughout the study area, following this, specific study sites were selected that were considered to be representative of the habitats found within the study area, 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 study area. Sherman 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, reptiles, amphibians, general invertebrates and arachnids. A separate avifaunal assessment has been undertaken to determine the local avian community. 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 study area and capture comprehensive data with respect to faunal taxa, the following methodology were 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 study 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;
- Relevant databases considered during the assessment of the study area included the Virtual Museum (VM), Important Bird and Biodiversity Areas (IBA, 2015), South African Bird Atlas Project 2 (SABAP2), International Union for Conservation of Nature (IUCN), the City of Cape Town Biodiversity Network Database (2019) 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 study area were considered, and sensitive areas were assessed. 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 proposed development activities. 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 study area. Species listed in Appendix B whose known distribution ranges and habitat preferences include the study area were taken into consideration. Faunal species likely to occur within the study 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 in February and August 2022, three broad habitat units were distinguished for the study area:

1. **Renosterveld Habitat:** this habitat unit comprised largely of sandy and rocky renosterveld (in which the grass layer is poorly developed and homogenous) which is mosaiced between shrubby grassland. The shallow, gravelly shrubland areas were characterized by small, scattered shrubs with some succulent species. Very little shelter for fauna was noted in this unit which comprises a small portion of the study area. The highly fragmented nature of the units reduces the sustainability potential for many fauna, but this unit is more sensitive than the remaining units from a faunal perspective. The low abundance of trees in most areas reduces the value of this unit for browsers, concurrently limiting the available shelter for larger species. Grazing and browsing was available in this unit but in most cases this is competed for with domestic

herbivores (sheep and cattle) reducing forage availability. The variable habitat structure associated with this unit (shrubs interspersed with grass) offers valuable shelter and foraging areas and is the last semblance of valuable shelter and habitat for smaller mammals and reptiles.

2. **Freshwater Habitat:** The Freshwater Habitat includes wetlands identified on site as per the wetland specialist report. Different faunal community compositions were supported within the habitat unit. The wetland offers unique habitat in terms of the saturated nature but has been heavily modified due to agricultural activities.
3. **Modified Habitat:** This habitat unit includes areas where vegetation has been significantly degraded or is entirely absent because of crop cultivation and ploughing, buildings (for housing and agriculture), historic airport development and Alien Invasive Plant (AIP) stands. This habitat has been severely impacted by anthropogenic activities and associated edge effects (e.g., dumping, AIP proliferation, and soil disturbance) which has resulted in the degradation of the unit and overall low species diversity. These areas do not favour habitation by most fauna as a result of these disturbances reducing forage and shelter availability. Some AIP stands do provide shelter for medium bodied fauna, but these will be removed and thus the suitability for this community will diminish.
4. **Artificial impoundments and Agricultural Drains**
   These artificial features within the study area are/were used to store/convey water primarily for agricultural purposes. These are not considered to be natural features, though the artificial impoundments will likely provide seasonal breeding localities for amphibians as well as a source of drinking water for other faunal species in the study area. The agricultural drains may be used by smaller species as movement corridors, though they are not considered of increased importance or sensitivity from a faunal perspective.

Figure 3 below provides a visual representation of the above mentioned habitat units while Section 3.2 and 3.4 provide a dashboard report of the findings of each faunal class.

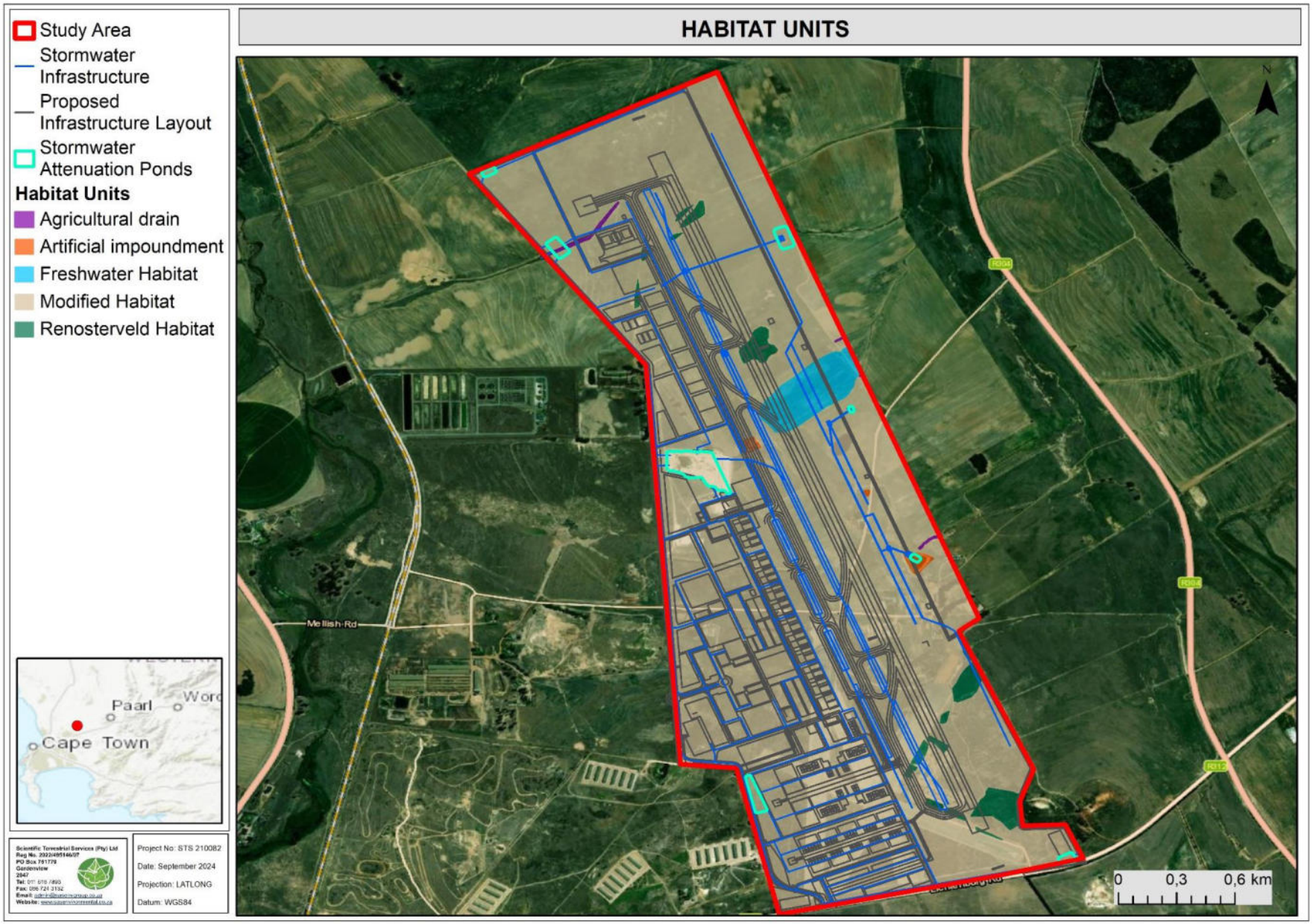


Figure 3: Conceptual illustration of the habitat units associated with the study and study area.

3.2 Mammals

Table 1: Field assessment results pertaining to mammal species within the study area.

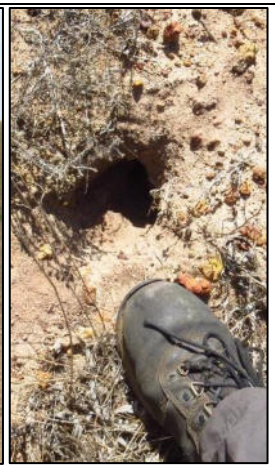
Photograph Notes:	Mammal Species of Conservation Concern (SCC)
Top: Left – *Raphicerus campestris* (Steenbok) were abundant throughout the study area. Right – *Herpestes ichneumon* (Egyptian mongoose) was noted within the Freshwater Habitat within a lowland drainage channel. **Bottom:** Left – Droppings belonging to a *Otocyon megalotis* (Bat-eared Fox), and Right – Mole hills of either *Cryptomys hottentotus* (African Mole-rat) or *Georychus capensis* (Cape Mole-rat).	No Mammal SCC are anticipated to occur within the study area.
   	**Conclusion - Mammals**
	The general transformed nature of the environment drastically reduces the amount of shelter and forage available while constant human movement creates further disturbances for mammals, this has reduced the presence of individuals within this class. Clearing of natural vegetation for development will have a direct impact on mammal habitat availability in the study area and any most mammals utilizing this area will disperse into the surrounding landscape. Impacts within the remaining Renosterveld and Freshwater do not occur over a large extent, but the sensitive nature of the habitat increases the impact on mammals. Increased human presence will lead to localised migration of many mammal species to adjacent habitats and result in a reduction of abundance and diversity within the study area. Species that relocate into the surrounding areas will be subject to higher levels of competition for food resources and space. Impacts to mammal species within the study area will result in the localised loss of habitat, diversity and mammal abundance, whilst edge effects such as noise, dust and potential footprint creep will impact on mammal species in the immediate vicinity of the proposed development. Additionally, the increased movement of vehicles as a result of any new development will increase mammal mortality rates due to potential vehicle collisions. No sensitive mammal species have been identified by the Department of Forestry, Fisheries and the Environment (DFFE) National screening tool.
General Mammal Discussion	
Mammal diversity within the study area was considered moderately low in general. Large mammal diversity is lower than would have been historically observed as megaherbivores and large predators were absent predominantly due to anthropogenic impacts in the surrounding landscape. Small and medium mammal diversity appeared to be moderately low to intermediate as some of its historic complement of fauna were observed within the study area, however, most occur at low abundances. The landscape comprises of three broad floral habitat units, however, from a faunal perspective remains relatively homogenous, dominated by the modified habitat,) limiting habitat availability and specialised niche habitat which would increase faunal diversity. Only small portions of unique natural vegetation (Renosterveld Habitat and portions of Freshwater Habitat) occur within the study area. The existing freshwater habitat is largely modified and provides limited value to many fauna, however, they are utilised as a corridor for movement. The Renosterveld Habitat does provide some valuable rocky habitat which will be favoured by rupicolous fauna species but this is highly fragmented an likely incapable of sustaining populations in the long term. Within the study area, habitat is degraded and transformed and for the most part is	

unsuitable for most mammals. During the field investigation no SCC were observed and it is unlikely that any occur within the study area or study area. Species such as *Raphicerus campestris* (Steenbok) were abundant throughout the study area while *Herpestes ichneumon* (Egyption mongoose) was observed on a single occasion. *Otocyon megalotis* (Bat-eared Fox) was seen to the south of the study area and may forage within the study area. Small rodents are the most abundant mammal community within the study area and burrows were noted in high abundances throughout the study area, particularly along the edges of cultivated fields and pockets of remaining natural vegetation. Forage availability for primary consumers is considered seasonal in much of the study area depending on agricultural activities being undertaken. Forage for small carnivorous mammals like shrews and genets is anticipated to be intermediate. Mesopredators will occur within the study area but large predators were completely absent from the study area.

The study area is almost completely surrounded by agricultural landscapes reducing habitat for mammals, with only limited connectivity to natural areas in the north of the study area exists. The study area is completely encompassed by transformed habitat. Thus, potential mammal source populations are not present and from a mammal perspective the study area does not hold value from a conservation perspective. High human movement and landscape transformation has degraded the existing mammal community, reducing it to mostly small bodied common species and small rodents. The existing human mediated activities and their associated edge effects vastly reduce the habitat integrity and have transformed most of the natural vegetation of the study area.

3.3 *Herpetofauna* (Reptiles and Amphibians)

Table 2: Field assessment results pertaining to amphibian species within the study area.

Photograph Notes:	Herpetofauna Species of Conservation Concern (SCC)			
Very few reptiles were seen within the study area or study area and none were photographed. Below are habitat observations from the field survey indicating potential niche habitats anticipated to be utilized by mostly reptiles. No amphibians were seen within the study area, the transformed nature of both the existing landscape and the modified nature of the Freshwater habitat has reduced habitat suitability for amphibians.	**Species**	**Suitable habitat and resources in the study area**	**Conservation Status**	**POC**
	Psammophis leightoni (Cape Sand Snake)	The remaining portions of Renosterveld habitat	VU	Medium
	Bradypodion pumilum (Cape Dwarf Chameleon).	Renosterveld habitat and areas of transformed habitat where more shrubby and dense AIP stands occur.	VU	Medium
   	**Conclusion - Herpetofauna**			
	The sensitivity of the site for herpetofauna is considered intermediate in the Renosterveld habitat and Freshwater habitat and Low for the cultivated areas (Modified habitat). According to online databases, the study area has a moderate potential to support high reptile diversity. Less opportunity is afforded to amphibians as a result of the modified nature of watercourse and the reduced habitat suitability in the existing impoundments within the study area. The transformed nature of the study area where constant ploughing occurs reduces its suitability for herpetofauna. Development within the Renosterveld and Freshwater habitat will lead to the loss of habitat and food resources, leading to a reduction in the abundance of reptiles within the study area. Clearing of vegetation for development, will have a direct impact on habitat availability, leading to localised migration of reptile species into the surrounding areas. The movement of reptile species out of the disturbance footprint areas will result in higher levels of competition for food resources and habitat, which can potentially lead to a decrease in abundance and diversity levels as resource competition increases in surrounding habitat. Impacts on species diversity will be limited whilst reptile abundance will likely be reduced as edge effects may impact on reptile species and their food resources in the immediate vicinity of potential development areas. Additionally, the increased movement of vehicles traveling as well as increased conflict with humans will likely increases the risk of persecution for reptile species. Amphibian habitat within the existing impoundments, although of reduced suitability, and increased collisions will be the main source of impacts to amphibians, however, the reduced abundance and diversity observed will mean impacts are of limited scales for amphibians. Impacts to the study area are anticipated to be low as a result of its transformed nature.			
Herpetofauna Discussion				
A low reptile diversity was observed during the field assessment of the focus and study area. Only two individual species *Trachylepis variegata* (Variegated Skink) and another lizard which could not be identified (individual was observed while moving and disappeared out of site before identification was possible) were observed during the assessment. Diversity and abundance				

are anticipated to be higher as the low abundances and diversities recorded are due to the short temporal scale of the investigation and the inherently secretive and shy characters of reptiles, making their detection and identification in the field challenging (specifically during site visits of a short duration). As such, based on the available databases, atlases, previous reports, food resources and habitat, it is deemed likely that the study area will be able to support mostly common reptile species. Virtual Museum (VM) records indicate 53 species for the larger QDS which include 2 notable species: *Psammophis leightoni* (Cape Sand Snake) and *Bradypodion pumilum* (Cape Dwarf Chameleon). It is however likely that the study area and study area will have a moderately low diversity in comparison to the QDS indications as the study area and study area are largely transformed. Habitat for these resiliant species was observed within most of the study area, even the Modified habitat may offer shelter and foraging oppurtunities to reptiles. Basking habitat was available for reptile species throughout much of the site where boulders, rocks or flat bare ground or natural vegetation was observed within the study area. The constant transformation within the study area as a result of agriculture will reduce the suitability and sustainability of the study area for herpetofauna. No limitations of reptile movement are anticipated within the area as they will readily utilise even transformed areas to move through. Habitat for more arboreal species was restricted to the dense, mostly shrubby Renosterveld habitat (which were identified in largely fragmented pockets) and portions of the invaded Modified habitat.

Rodent burrows and those of larger species, which are often utilised by snakes, were observed in high densities, providing shelter for burrowing snake species or food resources (rodents). There are likely sufficient levels of food resources for predatory snakes preying on small mammals, however herbivorous and insectivorous reptile species are likely to have high resource competition due to the lower levels of available food resources. The invertebrate abundances noted within the study area was moderately low limiting prey potential, notably the survey occurred outside the rainy season which is not ideal and better estimates on invertebrate activity would be made then.

Strongylopus grayii (Clicking Stream Frog) was recorded in artificial depressions in the southern extent of the study area by the botanical specialist. The transformed nature of the locality, especially the study area, and the absence of permanent watercourses limited amphibian abundance. Outside of the study area artificial dams and an old quarry do provide a permanent water source, however, they are artificial in nature and not connected to natural wetland areas where more niche specific and rare amphibians may occur. These artificially augmented impoundments may be suitable habitat but only to amphibians able to withstand the poor water quality (resulting from previous quarrying). The modified freshwater habitat within the study area will only flow temporarily during the rainy season and may present the only areas where breeding of endemic species may potentially occur. The Freshwater habitat, where amphibians are expected to occur was actively searched, however no species were observed during the site visit. The VM has records for *Sclerophrys capensis* (Raucous Toad), *Vandijkophrynus angusticeps* (Sand Toad), *Vandijkophrynus gariepensis* (Karoo Toad), *Amietia fuscigula* (Cape River Frog), *Strongylopus grayii* (Clicking stream Frog), *Tomopterna delalandii* (Cape Sand Frog) and *Xenopus laevis* (African Clawed Frog). The general transformed landscape does not lend itself to habitation by amphibians. Some species can be anticipated but will occur at low densities. The diversity anticipated within the study area is low and was determined through literature reviews and based on the habitat suitability. Forage is not anticipated to be a limiting factor for amphibians. Overall, the study area is considered to have a moderately low habitat availability as large areas are unsuitable for amphibians.

Reptiles are inherently adaptable and capable of surviving in transformed and degraded habitats thus it is expected that they will be able to utilise even transformed and degraded areas. The general locality is largely transformed, with some portions of the natural vegetation providing limited suitable refuge areas and basking habitat for reptile species. Sensitivity for amphibians is considered to be low as a result of the unsuitable habitat and the modified nature of the watercourses. No sensitive reptile or amphibian species have been identified by the DFFE National screening tool. Within the study area the transformed nature of the habitat does not lend itself to herpetofaunal conservation

3.4 Invertebrates

Table 3: Field assessment results pertaining to invertebrate species within the study area.

Photograph Notes:	Invertebrate Species of Conservation Concern (SCC)			
The invertebrate species community did not appear to be particularly rich within the study area or study area, mostly coleopterans, orthopterans and dipterans were noted. **Top:** Left – Habitat characteristics within the Renosterveld habitat were most favorable to invertebrates. Right - A large termite mound likely belonging to *Amitermes hastatus* (Black-mound Termite). **Bottom**: Left – Hister beetles belonging to the Family Histeridae. Right – Habitat for water dependent species was limited within the study area but artificial impoundments did provide some permanent habitat for these species.	**Species**	**Suitable habitat and resources in the study area**	**Conservation Status**	**POC**
	Aneuryphymus montanus (Yellow-winged Agile Grasshopper),	The species is associated with fynbos vegetation, where it has been collected amongst partly burnt stands of evergreen Sclerophyll vegetation in rocky foothills.	VU	Low
	Conocephalus peringueyi (Peringuey's Meadow Katydid)	This species is only known from mountains in the Fynbos biome, above 500m.	VU	Low
	Bullacris obliqua (Bladder Grasshopper).	*Bullacris obliqua* inhabits the Fynbos biome. *Eriocephalus africanus* is currently the only confirmed host plant for this species.	VU	Medium
	Opisthacanthus capensis (Cape Burrowing Scorpion)	Burrows in the open in hard substrate between the coast and the Cape Fold Mountains.	TOPS	Medium
   	**Conclusion - Invertebrates**			
	The overall sensitivity of the faunal habitat units ranges from intermediate to moderately low. Within the study area the habitat is completely transformed. The habitat in the study area is largely modified as a result of agriculture, historic mining, grazing of cattle and constant human thoroughfare and therefore does not represent the reference vegetation (Mucina and Rutherford, 2007 The high degree of habitat transformation and the limited amount of connectivity and forage severely limits the potential of the study area for invertebrates. The highly fragmented nature of the vegetation is not anticipated to be suitable for many rare species, endemic species and SCC, largely limiting the observations to commonly occurring species. Impacts anticipated on invertebrates through development of the study area or study area are unlikely to be high as a result of the study area characteristics.			
Invertebrate Discussion				
Invertebrate diversity and abundance within the study area and study area is considered moderately low. The moderately low diversities and abundances were due to the tranformed nature of the habitat and the limited oppurtunites for resources. Some portions within the study area, particularly the Renosterveld and Freshwater Habitat did appear to be richer in invertebrate				

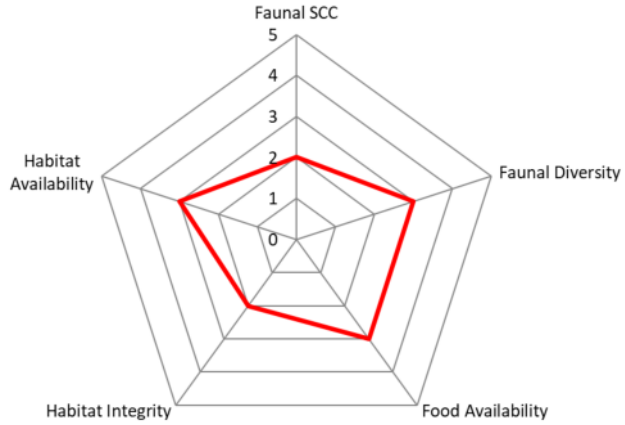
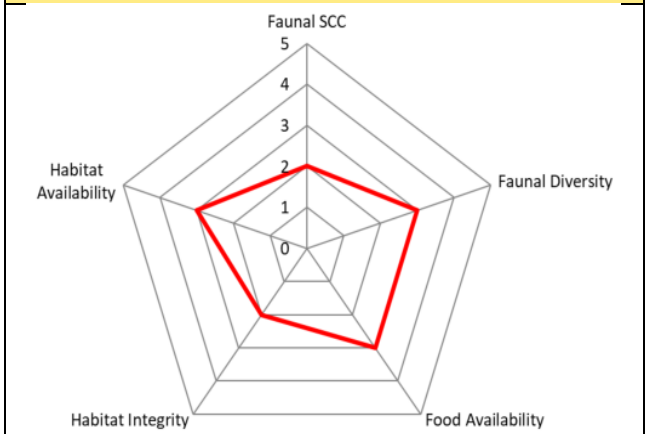
species. As a result of the agricultural activitites within the study area, this unit is completely transformed and thus was largely inhabited by common generalist invertebrate species. The higher floral richness within the Renosterveld with more stuctural variation and alternative niche habitats, and in portions greater floral species richness and structure provides valuable forage, habitat and biomass accumulation for invertebrate species to inhabit. The small size of invertebrates allows them to inhabit a small area and thus niche habitat is described at a different scale allowing them to utilize most habitats. Most of the insects observed during the field investigation were common species with broad habitat requirements. Insects belonging to the orders Coleoptera, Diptera and Orthoptera were the most commonly observed which is anticipated given the transformed nature of the study area and study area. Habitat transformation and pesticide use are considered to be the major factors contributing to the lowered diversity of invertebrates observed during the field investigations. A reduced floral diversity and structural variation reduce possible opportunities and niche habitat for invertebrate species, while, the reduced availability of rocky habitats limited the often preferred habitat for scorpions. Spiders were also noted in lower diversities and abundances, and in part suggest that their prey abundances are correspondingly low.

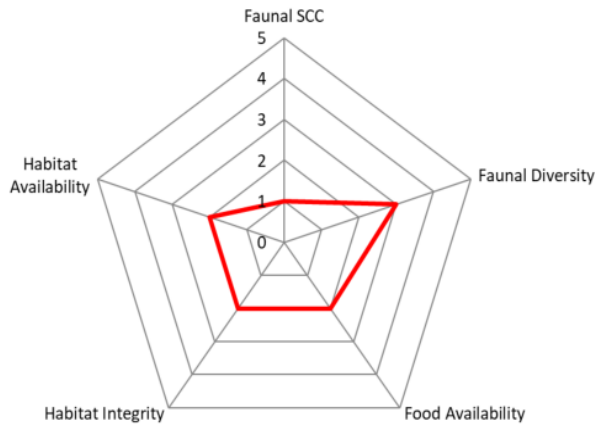
Three sensitive invertebrate species have been identified by the DFFE National screening tool, they include: *Aneuryphymus montanus* (Yellow-winged Agile Grasshopper), *Conocephalus peringueyi* (Peringuey's Meadow Katydid) and *Bullacris obliqua* (Bladder Grasshopper). *Bullacris obliqua* (Bladder Grasshopper) and *Opistophcanthus capensis* (Cape Burrowing Scorpion) may occur within the study area yet the transformed nature of the habitat reduces the suitability of the study area for these species.

4. SENSITIVITY MAPPING

Figure 4 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 implications for the proposed activities

Habitat Unit	Habitat Sensitivity	Conservation Objective	Key Habitat Characteristics
Freshwater Habitat **Artificial Impoundments**	Intermediate 	Preserve and enhance biodiversity of the habitat unit and surrounds while optimising development potential.	- No SCC were observed within this unit, however, the habitat is unique within the landscape (albeit aspects are considered artificial in nature) and may provide greater breeding and foraging opportunities for most fauna and potentially for *Psammophis leightoni* (Cape Sand Snake) due to the unique characteristics; - Development within this unit will lead to a reduction in habitat for both common species and potential SCC. As such development should avoid these areas as far as feasibly possible; - This habitat is important in terms of niche habitat for water dependant fauna; - Small artificial portions of this habitat occur within the study area, these areas are not considered sensitive as a result of the historic disturbances and fragmented nature of the habitat; - The drainage line is an important ecological system and an important movement corridor for fauna and should be avoided; - For the most part, besides the anthropogenically impacted drainage line, these habitats remain important in terms of ecological function; and - The Freshwater habitat, although ephemeral in nature and fragmented, remains unique within the landscape and impacts may alter faunal movement patterns and potentially lead to local population fragmentation.
Renosterveld Habitat	Intermediate 	Preserve and enhance biodiversity of the habitat unit and surrounds while optimising development potential.	- This habitat is the smallest within the study area and is considered to be of increased importance for faunal species in comparison to the remaining habitats, however this habitat cannot function in isolation and is supported by the less favourable surrounding habitats; - This unit is represented by fragmented portions of this habitat which cannot function in isolation and as such impacts to this unit will be low within the study area; - Portions of this habitat provide suitable grazing and browsing habitat for most fauna. Moreover, the increased abundance of trees and shrubs provides opportunities for shelter and habitat for arboreal species. Portions of these units have been heavily grazed which increases competition for resources for native fauna and decreases the forage value yet are the most diverse in terms of flora and faunal resource opportunities; - This unit has not experienced any transformation but has been degraded through edge effects, fragmentation and grazing but remains in a natural state; and

Habitat Unit	Habitat Sensitivity	Conservation Objective	Key Habitat Characteristics
			- This habitat unit provides valuable foraging and breeding opportunities for both common and SCC such as *Psammophis leightoni* (Cape Sand Snake) and *Bradypodion pumilum* (Cape Dwarf Chameleon) due to suitable habitat and vegetation associated therewith;
Modified Habitat **Agricultural Drains**	Moderately Low  	Optimise development potential while improving biodiversity integrity of surrounding natural habitat and managing edge effects.	- This habitat encompasses areas where previous development activities occurred with a large extent being utilised for crop cultivation and little natural vegetation persists; - Most of the study area is comprised of this unit, limiting the potential for a high diversity of fauna; - Sever AIP proliferation has reduced the habitat suitability of the unit and degraded it from a floral perspective; - Expansion into this habitat will have very limited impacts to faunal species in terms of forage, habitat and shelter; and - SCC may utilize these units temporarily to forage are unlikely to solely rely of these habitats.

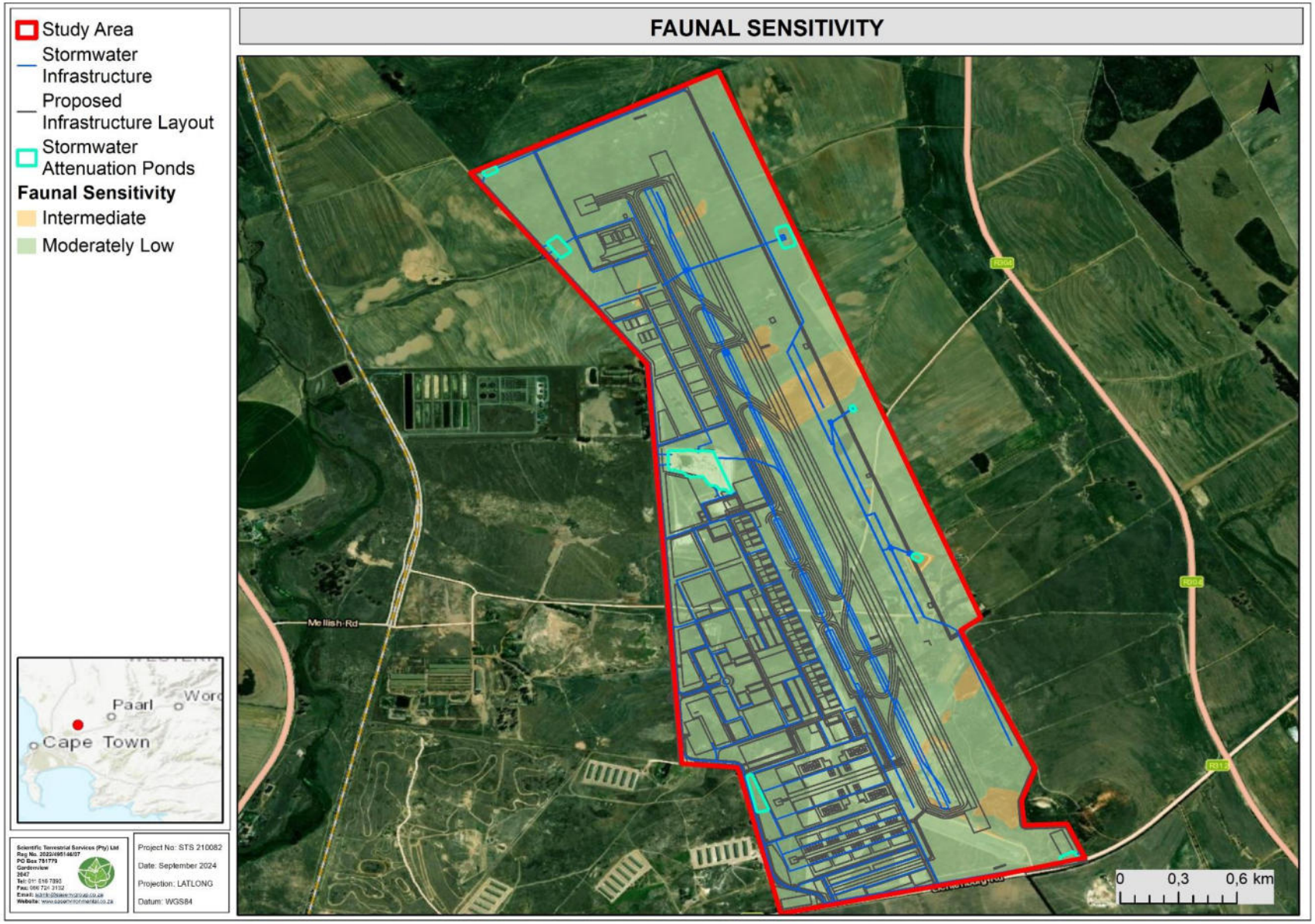


Figure 4: Faunal habitat sensitivity map for the study area.

5. IMPACT ASSESSMENT

The sections below provide the significance of perceived impacts arising from the proposed activities within the study area. The impact assessment is based on the layout provided by the proponent as illustrated in Figure 1 of this report, as well as Part A: Figures 4 and 5.

An impact discussion and assessment of all potential i) construction phase and ii) operational phase impacts are provided in Section 5.1 and 5.2 below. All mitigatory measures required to minimise the perceived impacts are presented in Section 5.1, within each impact table.

As indicated in Part A: Section 2, three layout alternatives are considered. The proposed 'no-go' alternative will not result in any additional impacts to faunal species and habitat identified within the study area, and as such, have not been included in the impact assessment. Due to the similarity in the layout of the preferred alternative (Figures 5 – 6) and the alternative 2, and considering that the layout alternatives will remain within the footprint of the study area, the anticipated impact of both alternatives on faunal species and their respective habitats are considered similar. As such, the Impact Assessment was conducted considering both layout alternatives.

5.1 Faunal Impact Assessment Results

Listed below are the perceived impacts which faunal species within the study area will be subjected to/threatened by as a result of the construction of the Cape Winelands Airport.

- Loss of habitat due to vegetation clearance activities;
- Displacement of species from the footprint areas during construction activities;
- Potential increased mortalities due to human – wildlife conflict as well as faunal species collisions with construction and operational vehicles;
- Potential poaching/snaring by staff/construction personnel;
- Loss of habitat connectivity and movement corridors within the landscape;
- Increased noise pollution from machinery during the construction phase and noise pollution from aircraft during the operational phase; and
- Increased light pollution, notably during the operational phase of the airport.

The tables below provide 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, post-mitigation impact scores will likely increase.

The impact assessment has been divided between impacts on **1)** faunal habitat and diversity (both direct and indirect impacts considered), and **2)** faunal SCC and their associated habitat.

Table 5. Construction Phase impacts on faunal habitat, diversity, and SCC from the proposed development. Required mitigation measures are presented at the bottom of each table section.

Habitat Unit / Aspect	UNMITIGATED							MITIGATED					
	Impact Negative (-) / Positive (+)	Extent	Magnitude	Duration	Probability	Confidence	Significance	Extent	Magnitude	Duration	Probability	Confidence	Significance
IMPACT ON FAUNAL HABITAT AND DIVERSITY													
Renosterveld Habitat	-	Local	Medium	Short Term	Definite	Certain	**Medium**	Site Specific	Medium	Short Term	Definite	Certain	**Low**
Freshwater Habitat	-	Local	Medium	Short Term	Definite	Certain	**Medium**	Site Specific	Medium	Short Term	Definite	Certain	**Low**
Modified Habitat	-	Local	Medium	Short Term	Definite	Certain	**Medium**	Site Specific	Medium	Short Term	Definite	Certain	**Low**
Artificial Impoundments	-	Site Specific	Medium	Short Term	Definite	Certain	**Low**	Site Specific	Medium	Short Term	Definite	Certain	**Low**
Agricultural Drains	-	Site Specific	Low	Short Term	Definite	Certain	**Very Low**	Site Specific	Low	Short Term	Definite	Certain	**Very Low**
IMPACT ON FAUNAL SCC AND THEIR HABITAT													
Renosterveld Habitat	-	Site Specific	Medium	Short Term	Definite	Certain	**Low**	Site Specific	Low	Short Term	Definite	Certain	**Very Low**
Freshwater Habitat	-	Site Specific	Low	Short Term	Definite	Certain	**Very Low**	Site Specific	Low	Short Term	Definite	Certain	**Very Low**
Modified Habitat	-	Site Specific	Medium	Short Term	Definite	Certain	**Low**	Site Specific	Low	Short Term	Definite	Certain	**Very Low**
Artificial Impoundments	-	Site Specific	Low	Short Term	Definite	Certain	**Very Low**	Site Specific	Low	Short Term	Definite	Certain	**Very Low**
Agricultural Drains	-	Site Specific	Low	Short Term	Definite	Certain	**Very Low**	Site Specific	Low	Short Term	Definite	Certain	**Very Low**

Mitigation Measures for Impacts on Faunal Species

- The development footprint should be demarcated, and it should be ensured that no development related activities take place outside of the demarcated footprint;
- Faunal habitat beyond the demarcated area should not be cleared or altered, except as needed for safety reasons around taxiways and runways as per the Bird and Wildlife Hazard Management Plan for the airport;
- Site clearance activities should take place in a phase manner, starting from the south moving northwards, or centrally moving outwards, so that faunal species can flee ahead of clearance activities into adjacent habitat and not get trapped in centralised, remnant patches;
- Construction personnel are to be educated about the various faunal species in the area, particularly about venomous spiders, snakes and scorpions. None of these or other species are to be killed or injured by construction personnel. Should any of these species be encountered, these species are to be safely and carefully relocated to the surrounding natural habitat adjacent the development site, should they not move off on their own;

Habitat Unit / Aspect	UNMITIGATED						Significance	MITIGATED					Significance
	Impact Negative (-) / Positive (+)	Extent	Magnitude	Duration	Probability	Confidence		Extent	Magnitude	Duration	Probability	Confidence	
- The contact details of a suitably qualified snake handler be made available to construction teams should a venomous snake be encountered that needs removal. Alternatively, it is recommended that a member of the construction team be trained to handle and remove snakes through a recognised snake handling course; - Sound environmental management practices should be adhered to at all times; - Alien plant species should be suitably managed and no further spread of alien plants should be allowed; - No illicit fires must be allowed during the construction phase; - External lighting should be kept to a minimum with downward and inward facing lights being used. Yellow or red fluorescent lights are preferable, while the use of bright white or LED lights should be avoided. Lighting used must be kept to minimum, but in allowance with the required health and safety requirement for nighttime operations; - Noise must be kept to acceptable levels as per the environmental norms and standards for noise mitigation as stipulated within the noise specialist report; - No hunting, trapping or collecting of faunal species is to be allowed, other than for rescue and relocation purposes. Setting of snares by personnel is to be prohibited; and - Suitable measures must be put in place to ensure that no sediment runoff from cleared areas enters any downstream/downslope habitat units which may lead to altered habitat conditions.												

Table 6. Operational Phase impacts on faunal habitat, diversity, and SCC from the proposed development. Required mitigation measures are presented at the bottom of each table section.

Habitat Unit / Aspect	UNMITIGATED							MITIGATED					
	Impact Negative (-) / Positive (+)	Extent	Magnitude	Duration	Probability	Confidence	Significance	Extent	Magnitude	Duration	Probability	Confidence	Significance
IMPACT ON FAUNAL HABITAT AND DIVERSITY													
Renosterveld Habitat	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Freshwater Habitat	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Modified Habitat	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Artificial Impoundments	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Agricultural Drains	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Noise Impacts	-	Local	Medium	Long Term	Definite	Certain	**Medium**	Local	Medium	Long Term	Definite	Certain	**Medium**
IMPACT ON FAUNAL SCC AND THEIR HABITAT													
Renosterveld Habitat	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Freshwater Habitat	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Modified Habitat	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Artificial Impoundments	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Agricultural Drains	-	Site Specific	Low	Long Term	Definite	Certain	**Low**	Site Specific	Very Low	Long Term	Definite	Certain	**Very Low**
Noise Impacts	-	Local	Medium	Long Term	Definite	Certain	**Medium**	Local	Medium	Long Term	Definite	Certain	**Medium**
Mitigation Measures for Impacts on Faunal Species													
- No further development related activities are to take place outside of the demarcated footprint unless duly authorised by the competent authority; - Faunal habitat beyond the demarcated area should not be cleared or altered, except as needed for safety reasons around taxiways and runways as per the Bird and Wildlife Hazard Management Plan for the airport;													

Habitat Unit / Aspect	UNMITIGATED							MITIGATED					
	Impact Negative (-) / Positive (+)	Extent	Magnitude	Duration	Probability	Confidence	Significance	Extent	Magnitude	Duration	Probability	Confidence	Significance
- Operational personnel are to be educated about the various faunal species in the area, particularly about venomous spiders, snakes and scorpions. None of these or other species are to be killed or injured by personnel. Should any of these species be encountered, these species are to be safely and carefully relocated to the surrounding natural habitat adjacent the development site, should they not move off on their own; - The contact details of a suitably qualified snake handler be made available to construction teams should a venomous snake be encountered that needs removal. Alternatively, it is recommended that a member of the operational team be trained to handle and remove snakes through a recognised snake handling course; - Sound environmental management practices should be adhered to at all times; - Alien plant species should be suitably managed and no further spread of alien plants should be allowed; - No illicit fires are to be allowed during the construction phase; - Whilst it is accepted that there will likely be significant external lighting during the operational phase, it is still recommended that the amount of light be minimised as far as possible (notably outward shining/emitted light), and that downward and inward facing lights be used wherever possible, but within legislated operational health and safety guidelines/requirements. Yellow or red fluorescent lights are preferable for building and perimeter lighting, whilst the use of bright white or LED lights should only be used as and where necessary for apron lighting (or as required by operational health and safety for airport operations). Lighting used must be kept to minimum, but in allowance with the required health and safety requirement for airport operations; - Noise levels must be suitably managed in line with the norms and standards for airports operations. It is however acknowledged that the larger aircraft will generate noise levels beyond the recommended health and safety guidelines, and that these unfortunately cannot, at this point in time, be reduced due to the nature of turbine jet engines; - Stormwater is to be suitably controlled and discharge points monitored for erosion; and - No hunting, trapping, or setting of snares by personnel is to be allowed. Suitable fines/disciplinary actions for such must be made known and implemented.												

5.2 Impact Discussion

The sections below provide the significance of perceived impacts arising from the proposed development. The below sections break down the various impacts anticipated for the different aspects of the proposed development.

5.2.1 Impacts on Faunal Habitat and Diversity

The study area is predominantly defined by modified habitat which comprises of habitat which has been significantly degraded due to alien plant proliferation as well as extensive crop cultivation. This has resulted in an already significant degree of habitat loss for faunal species, and consequently a marked decrease in faunal species diversity and abundance. It was noted that there are small remnant patches of natural habitat remaining within the study area, though the small and isolated nature of these patches limit species diversity and abundance herein. As such, the proposed development, whilst extensive in footprint, is not expected to result in a significant loss of natural habitat, resources or faunal species diversity. The proposed development will however impact upon species movement and habitat connectivity, though it is accepted that fences and habitat degradation and anthropogenic activities in some areas are already impacting on species movement.

5.2.2 Impacts on Faunal SCC

Current habitat degradation both within and outside of the study area has already resulted in loss of suitable habitat which may support faunal SCC. The proposed development will result in the extensive transformation of land, though as much of the proposed development area is already degraded, there is unlikely to be a significant impact to faunal species.

5.2.3 Probable Residual Impacts

Even with extensive mitigation, residual impacts on the receiving faunal ecological environment are likely. The following points highlight the key residual impacts that have been identified. It should be noted, however, that some of these impacts are, to a degree, already present as a result of the current farming activities.

- Continued degradation of natural habitat adjacent to the airport structures as a result of edge effects and operational requirements (cutting back of vegetation adjacent to runways etc);
- Altered faunal species habitat, diversity, movement patterns and breeding opportunities;
- Potential decrease of faunal abundance in the local area;

- Further habitat fragmentation/degradation as a result of AIP proliferation in the adjacent and undeveloped areas;
- Disturbed areas are highly unlikely to be rehabilitated to baseline levels of ecological functioning and loss of faunal habitat and species diversity may be long term; and
- Permanent loss of potential habitat for faunal SCC in the study area.

5.2.4 Cumulative Impacts

The study area is located within a region which has already been subjected to extensive land transformation and habitat degradation, stemming from agricultural activities, urban/peri-urban development as well as extensive alien plant proliferation. Such activities have already resulted in a notable cumulative loss of habitat within the region. The proposed development will however likely add to long term cumulative impacts, as once developed, rehabilitation/restoration of habitats (should the airport ever close down|) is unlikely. The increased traffic, notably air traffic will however add to the cumulative noise impacts for the region, and may result in further displacement of noise sensitive species.

5. CONCLUSION AND RECOMMENDATIONS

During the field assessment the following broad habitat units were identified, namely the Renosterveld Habitat, Freshwater Habitat, Modified habitat and Artificial Impoundments and Agricultural Drains. The most important habitat noted within the site from a faunal perspective was the Intermediate sensitivity Renosterveld Habitat, however, this unit is highly fragmented and has been exposed to a high degree of edge effects, AIP and grazing. The Renosterveld habitat provides valuable basking habitat for reptiles (arboreal habitat is limited) and valuable patchy niche habitat for invertebrates and small mammals. Also considered of intermediate sensitivity is the Freshwater Habitat which may provide conduits for movement and may provide valuable seasonal niche habitat to species which select for moist areas. The Modified habitat was considered to be of moderately low faunal sensitivity as a result of the current cultivation and associated activities and the severe AIP proliferation. The Modified habitat offers limited value for faunal utilisation. Habitat integrity within the study area is reduced due to the modified landscape with limited source populations for recolonisation limiting the conservation potential of the study area.

Although large tracts of land will be transformed as part of the development, the already degraded state of the study area overall decreases the significance of impacts overall. Provided mitigation measures are suitably implemented, the proposed development is not

anticipated to result in extensive loss of important habitat or SCC within the study area or region. With mitigation, all impacts can be reduced to low and very low significance levels.

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.

Based on the results of the site assessment and the overall impact significance scores, it is the opinion of the specialist that this project may be approved, provided that all management and mitigation measures as stipulated in this report are adhered to.

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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 study area may have an impact on faunal behaviour and in turn the rate of observations. In order to increase overall observation time within the study area, as well as increasing the likelihood of observing shy and hesitant species, Sherman traps were strategically placed within the study area. Sherman traps were used to increase the likelihood of capturing and observing small mammal species, notably small nocturnal mammals.

Mammals

Small mammals are unlikely to be directly observed in the field because of their nocturnal/crepuscular and cryptic nature. A simple and effective solution to this problem is to use Sherman traps. A Sherman trap is a small aluminium box with a spring-loaded door (Figure A1). Once the animal is inside the trap, it steps on a small plate that causes the door to snap shut, thereby capturing the individual. In the event of capturing a small mammal during the night, the animal would be photographed and then set free unharmed early the following morning. Traps were baited with a universal mixture of oats, peanut butter, and fish paste.

Figure A1: Sherman trap and bait used to capture and identify small mammal species.

Furthermore, mammal species were recorded during the field assessment with the use of visual identification, spoor, call 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).

Avifauna

The Southern African Bird Atlas Project 2 database (http://sabap2.adu.org.za/) was compared with the recent field survey of avifaunal species identified in the study area. Field surveys were undertaken utilising direct observation and bird call identification techniques in order to accurately identify avifaunal species. Specific attention was given to avifaunal SCC listed on a regional and national level, as well as those identified by the International Union for the Conservation of Nature (IUCN). Four monitoring points, at which an hour was spent at each point, on the borders of the study area were undertake.

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 study 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 study 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).

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 study 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 study 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 study 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 study 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 study 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 and surrounds while optimising 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.

APPENDIX B: Faunal SCC

Table B1: Threatened Mammal Species associated with the Western Cape (CapeNature, 2017)

Common Name	Taxon Name	2016 Regional IUCN Assessments
CRITICALLY ENDANGERED		
Riverine rabbit	*Bunolagus monticularis*	Critically Endangered C2a(i)
Antarctic true blue whale	*Balaenoptera musculus intermedia*	Critically Endangered A1abd
Boosmansbos long-tailed forest shrew	*Myosorex longicaudatus boosmani*	Critically Endangered B1ab(ii,iii)+2ab(ii,iii)
ENDANGERED		
	Cryptochloris zyli	Endangered B1ab(iii)+2ab(iii)
African wild dog	*Lycaon pictus*	Endangered D
Sei whale	*Balaenoptera borealis*	Endangered A1d
Southern Hemisphere fin whale	*Balaenoptera physalus*	Endangered A1d
Mountain reedbuck	*Redunca fulvorufula fulvorufula*	Endangered A2b
Indian hump-backed dolphin	*Sousa plumbea*	Endangered A4cd; B1ab(iii,v)
Long-tailed forest shrew	*Myosorex longicaudatus*	Endangered B1ab(ii,iii)+2ab(ii,iii)
Southwestern black rhinoceros	*Diceros bicornis bicornis*	Endangered D
VULNERABLE		
Bryde's whale	*Balaenoptera edeni*	Vulnerable
Sperm whale	*Physeter macrocephalus*	Vulnerable A1d
Grant's golden mole	*Eremitalpa granti granti*	Vulnerable B1ab(iii)+B2ab(iii)
Bontebok	*Damaliscus pygargus pygargus*	Vulnerable B2ab(ii)+D1
Cheetah	*Acinonyx jubatus*	Vulnerable C2a(i)+D1
Cape Marsh Rat	*Dasymys capensis*	Vulnerable B1ab(ii,iii,iv)+B2ab(ii,iii,iv)
Duthie's golden mole	*Chlorotalpa duthieae*	Vulnerable B1ab(iii)+2ab(iii)
Blue duiker	*Philantomba monticola monticola*	Vulnerable B2ab(ii,iii,v)+C2a(i)
Leopard	*Panthera pardus*	Vulnerable C1
Black-footed cat	*Felis nigripes*	Vulnerable C2a(i)
White-tailed mouse	*Mystromys albicaudatus*	Vulnerable C2a(i)
Humpback whale	*Megaptera novaeangliae*	Vulnerable D1
Namib long-eared bat	*Laephotis namibensis*	Vulnerable D1
NEAR THREATENED		
Grey rhebok	*Pelea capreolus*	Near Threatened A2b
Southern elephant seal	*Mirounga leonina*	Near Threatened A2b
Spectacled dormouse	*Graphiurus ocularis*	Near Threatened A2bc
Laminate vlei rat	*Otomys laminatus*	Near Threatened B2ab(i,ii,iii,iv)+C1+C2a(i)
Serval	*Leptailurus serval serval*	Near Threatened B2ab(ii,iii,iv,v)+C2a(i)
Fynbos golden mole	*Amblysomus corriae*	Near Threatened B2ab(iii)
Indian Ocean bottlenosed dolphin	*Tursiops aduncus*	Near Threatened B2ab(iii,v)
Littledale's whistling rat	*Parotomys littledalei*	Near Threatened B2b(iii,iv),c(iii)
African striped weasel	*Poecilogale albinucha*	Near Threatened C1
African clawless otter	*Aonyx capensis*	Near Threatened C2a(i)
Brown hyaena	*Parahyaena brunnea*	Near Threatened C2a(i)+D1
Spotted hyaena	*Crocuta crocuta*	Near Threatened C2a(ii)

CR = Critically Endangered, EN = Endangered, NT = Near Threatened, VU = Vulnerable, P=Protected

Table B2: List of conservation priority bird species for the Western Cape (CapeNature, 2017)

Table 2: List of species classified as Endangered at a regional scale. Corresponding statuses as at 2007 and 2012 SOB report as well as the global statuses are including for comparison.

Common Name	Scientific Name	Regional Status			Global Status		
		2007	2012	2017	2007	2012	2017
Roseate Tern	*Sterna dougallii*	EN	EN	EN	LC	LC	LC
African Marsh-Harrier	*Circus ranivorus*	V	V	EN	LC	LC	LC
African Penguin	*Spheniscus demersus*	V	V	EN	V	EN	EN
Bank Cormorant	*Phalacrocorax neglectus*	V	V	EN	EN	EN	EN
Cape Vulture	*Gyps coprotheres*	V	V	EN	V	V	EN
Ludwig's Bustard	*Neotis ludwigii*	V	V	EN	LC	EN	EN
Martial Eagle	*Polemaetus bellicosus*	V	V	EN	LC	NT	V
Black Harrier	*Circus maurus*	NT	NT	EN	V	V	V
Cape Cormorant	*Phalacrocorax capensis*	NT	NT	EN	NT	NT	EN
Antarctic Tern	*Sterna vittata*	LC	LC	EN	LC	LC	LC
Hottentot Buttonquail	*Turnix hottentottus*	NE	NE	EN	LC	LC	EN

Table 3: List of species classified as Vulnerable at a regional scale. Corresponding statuses as at 2007 and 2012 as well as the global statuses are including for comparison.

Common Name	Scientific Name	Regional Status			Global Status		
		2007	2012	2017	2007	2012	2017
African Finfoot	*Podica senegalensis*	V	V	V	LC	LC	LC
African Grass-Owl	*Tyto capensis*	V	V	V	LC	LC	LC
Cape Gannet	*Morus capensis*	V	V	V	V	V	V
Denham's Bustard	*Neotis denhami*	V	V	V	NT	NT	NT
Knysna Warbler	*Bradypterus sylvaticus*	V	V	V	V	V	V
Striped Flufftail	*Sarothrura affinis*	V	V	V	LC	LC	LC
African Crowned Eagle	*Stephanoaetus coronatus*	NT	NT	V	NT	LC	LC
Black Stork	*Ciconia nigra*	NT	NT	V	LC	LC	LC
Caspian Tern	*Sterna caspia*	NT	NT	V	LC	LC	LC
Great White Pelican	*Pelecanus onocrotalus*	NT	NT	V	LC	LC	LC
Lanner Falcon	*Falco biarmicus*	NT	NT	V	LC	LC	LC
Secretarybird	*Sagittarius serpentarius*	NT	NT	V	LC	V	V
Burchell's Courser	*Cursorius rufus*	LC	LC	V	LC	LC	LC
Verreaux's Eagle	*Aquila verreauxii*	LC	LC	V	LC	LC	LC
Southern Black Korhaan	Afrotis afra	NE	NE	V	NE	NE	V

Table 4: List of species classified as Near Threatened at a regional scale. Corresponding statuses as at 2007 and 2012 as well as the global statuses are including for comparison.

Common Name	Scientific Name	Regional Status			Global Status		
		2007	2012	2017	2007	2012	2017
Blue Crane	*Anthropoides paradiseus*	V	V	NT	V	V	V
Kori Bustard	*Ardeotis kori*	V	V	NT	LC	LC	NT
Agulhas Long-billed Lark	*Certhilauda brevirostris*	NT	NT	NT	NR	NR	NE
Black-winged Lapwing	*Vanellus melanopterus*	NT	NT	NT	LC	LC	LC
Chestnut-banded Plover	*Charadrius pallidus*	NT	NT	NT	NT	NT	NT
Crowned Cormorant	*Phalacrocorax coronatus*	NT	NT	NT	NT	NT	NT
Greater Flamingo	*Phoenicopterus roseus*	NT	NT	NT	LC	LC	LC
Greater Painted-snipe	*Rostratula benghalensis*	NT	NT	NT	LC	LC	NR
Half-collared Kingfisher	*Alcedo semitorquata*	NT	NT	NT	LC	LC	LC
Knysna Woodpecker	*Campethera notate*	NT	NT	NT	NT	NT	NT
Lesser Flamingo	*Phoeniconaias minor*	NT	NT	NT	LC	LC	NT
Peregrine Falcon	*Falco peregrinus*	NT	NT	NT	LC	LC	LC
Sclater's Lark	*Spizocorys sclateri*	NT	NT	NT	NT	NT	NT
African Rock Pipit	*Anthus crenatus*	LC	LC	NT	LC	LC	LC
Cape Rock-jumper	*Chaetops frenatus*	LC	LC	NT	LC	LC	LC
Eurasian Curlew	*Numenius arquata*	LC	LC	NT	LC	NT	NT
European Roller	*Coracias garrulous*	LC	LC	NT	NT	NT	LC
Karoo Korhaan	*Eupodotis vigorsii*	LC	LC	NT	LC	LC	LC
Maccoa Duck	*Oxyura maccoa*	LC	LC	NT	NT	NT	NT

NYBA = Not yet been assessed, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, EN = Endangered, Ad mon = Additional Monitoring, End and N-end = Endemic and Near endemic

South African Bird Atlas Project 2 list for quadrant 3318DC

Avifaunal Species for the pentad 3345_1840 within the QDS 3318DC
http://sabap2.adu.org.za/coverage/pentad/3345_1840.

Table B3: Threat status of Reptile Species for the Western Cape (CapeNature, 2017).

Species	English name	Regional IUCN	Global IUCN
Psammobates geometricus	geometric tortoise	Critically Endangered (A2acde)	Critically Endangered (A2acde+4acde)
*Lepidochelys olivacea**	olive ridley turtle	Data Deficient	Vulnerable (A2bd)
*Dermochelys coriacea**	leatherback sea turtle	Endangered (D)	Vulnerable (A2bd)
*Crocodylus niloticus**	Nile crocodile	Vulnerable (A2ac)	Least Concern
Homopus signatus	speckled padloper	Vulnerable (A2acde)	Vulnerable (A2acde)
Bradypodion pumilum	Cape dwarf chameleon	Vulnerable (B1ab)	Vulnerable (B1ab)
Psammophis leightoni	fork-marked whip snake	Vulnerable (B1ab)	Vulnerable (B1ab)
Bitis armata	southern adder	Vulnerable (B1ab+2ab)	Vulnerable (B1ab+2ab)
*Caretta caretta**	loggerhead turtle	Vulnerable (D1)	Endangered (A1abd)
Hemicordylus nebulosus	dwarf crag lizard	Vulnerable (D1+2)	Vulnerable (D1+2)
Afroedura hawequensis	Hawequa flat gecko	Near Threatened	Near Threatened
*Chelonia mydas**	green turtle	Near Threatened	Endangered (A2bd)
Cordylus macropholis	large-scaled girdled lizard	Near Threatened	Near Threatened
Cordylus niger	black girdled lizard	Near Threatened	Near Threatened
Cordylus oelofseni	Oelofsen's girdled lizard	Near Threatened	Near Threatened
*Eretmochelys imbricata**	hawksbill sea turtle	Near Threatened	Critically Endangered (A2bd)
Goggia braacki	Braack's dwarf leaf-toed gecko	Near Threatened	Near Threatened
Homopus boulengeri	Karoo padloper	Near Threatened	Near Threatened
Scelotes gronovii	Gronovi's dwarf burrowing skink	Near Threatened	Near Threatened
Scelotes kasneri	Kasner's dwarf burrowing skink	Near Threatened	Near Threatened
Scelotes montispectus	Bloubergstrand dwarf burrowing skink	Near Threatened	Near Threatened

Table B4: List of all amphibian species noted for the western cape, including their regional and global conservation status (CapeNature. 2017)

Taxon	English Name	Regional IUCN	Global IUCN
Afrixalus knysnae	Knysna leaf-folding frog	Endangered (B1ab+2ab)	Endangered (B1ab+2ab)
Amietia delalandii	Queckett's river frog	Least Concern	Least Concern
Amietia fuscigula	Cape river frog	Least Concern	Least Concern
Amietia poyntoni	Poynton's river frog	Least Concern	Least Concern
Amietia vandijki	van Dijk's river frog	Least Concern	Least Concern
Arthroleptella bicolor	Bain's Kloof moss frog	Least Concern	Least Concern
Arthroleptella drewesii	Drewes's moss frog	Near Threatened	Near Threatened
Arthroleptella landdrosia	Landdroskop moss frog	Near Threatened	Near Threatened
Arthroleptella lightfooti	Cape Peninsula moss frog	Near Threatened	Near Threatened
Arthroleptella rugosa	rough moss frog	Critically Endangered (B1ab+2ab)	Critically Endangered (B1ab+2ab)
Arthroleptella subvoce	northern moss frog	Critically Endangered (B1bc+2bc)	Critically Endangered (B1bc+2bc)
Arthroleptella villiersi	De Villiers's moss frog	Least Concern	Least Concern
Breviceps acutirostris	strawberry rain frog	Least Concern	Least Concern
Breviceps fuscus	plain rain frog	Least Concern	Least Concern
Breviceps gibbosus	Cape rain frog	Near Threatened	Near Threatened
Breviceps montanus	Cape mountain rain frog	Least Concern	Least Concern
Breviceps namaquensis	Namaqua rain frog	Least Concern	Least Concern
Breviceps rosei	sand rain frog	Least Concern	Least Concern
Cacosternum aggestum	Klipheuwel dainty frog	Least Concern	Least Concern
Cacosternum australis	southern dainty frog	Least Concern	Least Concern
Cacosternum boettgeri	common dainty frog	Least Concern	Least Concern
Cacosternum capense	Cape dainty frog	Near Threatened	Near Threatened
Cacosternum karooicum	Karoo dainty frog	Least Concern	Least Concern
Cacosternum namaquense	Namaqua dainty frog	Least Concern	Least Concern
Cacosternum nanum	bronze dainty frog	Least Concern	Least Concern
Cacosternum platys	Flat dainty frog	Near Threatened	Near Threatened
Capensibufo deceptus	Deception Peak mountain toadlet	Data Deficient	Data Deficient
Capensibufo magistratus	Landdroskop mountain toadlet	Data Deficient	Data Deficient
Capensibufo rosei	Rose's mountain toadlet	Critically Endangered (B1abc+2ab)	Critically Endangered (B1abc+2ab)
Capensibufo selenophos	moonlight mountain toadlet	Data Deficient	Data Deficient
Capensibufo tradouwi	Tradouw mountain toadlet	Least Concern	Least Concern
*Chiromantis xerampelina**	foam nest frog	Least Concern	Least Concern
Heleophryne depressa	NULL	NULL	Not Evaluated
Heleophryne orientalis	eastern ghost frog	Least Concern	Least Concern
Heleophryne purcelli	Cape ghost frog	Least Concern	Least Concern
Heleophryne regis	southern ghost frog	Least Concern	Least Concern
Heleophryne rosei	Table Mountain ghost frog	Critically Endangered (B1ab+2ab)	Critically Endangered (B1ab+2ab)
Hyperolius horstockii	arum lily frog	Least Concern	Least Concern
Hyperolius marmoratus	painted reed frog	Least Concern	Least Concern
Kassina senegalensis	bubbling kassina	Least Concern	Least Concern
Microbatrachella capensis	micro frog	Critically Endangered (B2ab)	Critically Endangered (B2ab)
Poyntonia paludicola	montane marsh frog	Near Threatened	Near Threatened
Poyntonophrynus vertebralis	southern pigmy toad	Least Concern	Least Concern
Pyxicephalus adspersus	African giant bullfrog	Least Concern	Least Concern
*Sclerophrys gutturalis**	guttural toad	Least Concern	Least Concern
Sclerophrys pantherina	western leopard toad	Endangered (B1ab+2ab)	Endangered (B1ab+2ab)
Sclerophrys pardalis	eastern leopard toad	Least Concern	Least Concern
Sclerophrys capensis	raucous toad	Least Concern	Least Concern
Semnodactylus wealii	rattling frog	Least Concern	Least Concern
Strongylopus bonaespei	banded stream frog	Least Concern	Least Concern
Strongylopus fasciatus	striped stream frog	Least Concern	Least Concern
Strongylopus grayii	clicking stream frog	Least Concern	Least Concern
Tomopterna delalandii	Cape sand frog	Least Concern	Least Concern
Tomopterna tandyi	Tandy's sand frog	Least Concern	Least Concern
Vandijkophrynus angusticeps	Cape sand toad	Least Concern	Least Concern
Vandijkophrynus gariepensis	Karoo toad	Least Concern	Least Concern
Vandijkophrynus robinsoni	paradise toad	NULL	Least Concern
Xenopus gilli	Cape platanna	Endangered (B1ab+2ab)	Endangered (B1ab+2ab)
Xenopus laevis	common platanna	Least Concern	Least Concern

APPENDIX C: Faunal Species List

Table C1: Mammal species or signs thereof recorded during the field assessment.

Scientific Name	Common Name	Status
Otocyon megalotis	Bat-eared Fox	LC
Genetta genetta	Small-spotted Genet	LC
Herpestes ichneumon	Egyptian mongoose	LC
Sylvicapra grimmia	Common duiker	LC
Cryptomys hottentotus / Georychus capensis	African Mole-rat / Cape Mole-rat)	LC
Lepus saxatilis	Scrub hare	LC
Rhabdomys pumilio	Four-striped grass mouse	LC
Raphicerus campestris	Steenbok	LC
Hystrix africaeaustralis	Porcupine	LC

LC = Least Concern

Table C2: Reptile species recorded during the field assessment.

Scientific name	Common Name	IUCN 2016 Status
Trachylepis variegata	Variegated Skink	LC

LC = Least Concern

Table C3: Invertebrate species recorded during the field assessment.

Scientific name	Common Name	IUCN 2022 Status
Apis mellifera	Killer Bee	LC
Anthia sp.	Ground Beetle	NA
Conchyloctenia punctata	African Spotted Tortoise	NYBA
Argiope australis	Garden Orb	NYBA
Anax imperator	Blue Emperor	LC
Utetheisa pulchella	Crimson-speckled Flunkey	NYBA
Compsothespis sp	Bark Mantis	NA
Polistes dominula	European Paper Wasp	NYBA
Gryllotalpa africana	Common African Mole Cricket	LC
Acanthacris ruficornis	Garden Locust	LC
Stegodyphus dumicola	Social Spider	NYBA
Truxaloides sp.	Stick Grasshopper	NA
Diaphone eumela	Cherry Spot Moth	NYBA
Amitermes hastatus	Blackmound Termite	NYBA
Sphingonotus scabriculus	Blue-wing grasshopper	NYBA
Crematogaster peringueyi	Black Cocktail Ant	NYBA
Acherontia atropos	Death's Head Hawkmoth	NYBA
Icerya purchasi	Cottony Cushion Scale	NYBA
Cheilomenes lunata	Lunate Lady Beetle	NYBA
Ceroplesis aethiops	Pea Longhorn Beetle	NYBA
Vanessa cardui	Painted Lady	LC
Oedaleus nigrofasciatus	Yellow-wing Grasshopper	NYBA
Eristalis tenax	Common Drone Fly	LC
Schistocera gregaria	Desert Locust	NYBA
Scelophysa trimeni	Monkey Beetle	NYBA

Scientific name	Common Name	IUCN 2022 Status
Listroderes costirostris	Vegetable Weevil	NYBA
Ectrichodia crux	Assassin bug	NYBA
Palpares speciosus	Spotted Veld Antlion	NYBA
Meloe angulatus	Cape Oil Beetle	NYBA
Monolepta bioculata	Two-eye Leafbeetle	NYBA
Hypocrites scabriusculus	Metallic Long-horn Beetle	NYBA
Musca domestica	House Fly	NYBA

LC = Least Concern, NYBA = Not Yet Been Assessed

Table C4: Amphibian species recorded in the site.

Scientific name	Common Name	IUCN 2016 Status
Strongylopus grayii	Clicking Stream Frog	LC

LC = Least Concern