Terrestrial Animal Site Sensitivity Verification and Species Specialist Assessment Report

Proposed infrastructure upgrade and expansion of the tourist accommodation facilities on Rusty Gate Mountain Retreat, Farms 824, Rem. Farm 826 and Farm 887, in the Caledon District

Prepared for: LORNAY ENVIRONMENTAL CONSULTING

April 2025

Prepared by: Jan A Venter & Rudi Swart

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Recommended citation:
Venter, J.A. & Swart, R., 2024. Terrestrial Animal Site Sensitivity Verification and Species Specialist Assessment Report - Proposed infrastructure upgrade and expansion of the tourist accommodation facilities on Rusty Gate Mountain Retreat, Farms 824, Rem. Farm 826 and Farm 887, in the Caledon District. Technical Report prepared for Lornay Environmental Consulting, George, Western Cape, ZA.

Declaration of independence

- ❖ We consider ourselves bound to the rules and ethics of the South African Council for Natural Scientific Professions (SACNASP);
- ❖ At the time of conducting the study and compiling this report, we did not have any interest, hidden or otherwise, in the proposed development that this study has reference to, except for financial compensation for work done in a professional capacity;
- ❖ Work performed for this study was done objectively. Even if this study results in views and findings that are not favourable to the client/applicant, I will not be affected in any manner by the outcome of any environmental process of which this report may form a part, other than being members of the general public;
- ❖ We declare that no circumstances may compromise my objectivity in performing this specialist investigation. We do not necessarily object to or endorse any proposed developments but aim to present facts, findings and recommendations based on relevant professional experience and scientific data;
- ❖ We do not have any influence over decisions made by the governing authorities;
- ❖ We undertake to disclose all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken concerning the application by a competent authority to such a relevant authority and the applicant;
- ❖ We have the necessary qualifications and guidance from professional experts in conducting specialist reports relevant to this application, including knowledge of the applicable Act, regulations and any guidelines that have relevance to the proposed activity;
- ❖ This document and all information contained herein is and will remain our intellectual property. This document, in its entirety or any portion thereof, may not be altered in any manner or form for any purpose without the specific and written consent of the specialist investigators.
- ❖ All the particulars we furnished in this document are true and correct.

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Signature	Date

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Signature	Date

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Executive Summary

This specialist faunal assessment was conducted to evaluate the potential ecological impacts of the proposed infrastructure upgrades and expansion of tourist accommodation at Rusty Gate Mountain Retreat, situated in the Caledon District of the Western Cape. The site was flagged as having high terrestrial animal sensitivity by the Department of Forestry, Fisheries and the Environment (DFFE) screening tool. Through a combination of desktop research and field surveys, the presence and likelihood of occurrence of species of conservation concern (SCC) were assessed, with particular emphasis on taxa such as the Striped Flufftail (*Sarothrura affinis*), Black Harrier (*Circus maurus*), endemic amphibians, SCC invertebrates, and wide-ranging mammals like leopard and grey rhebok.

The study applied the SANBI (2020) guidelines to evaluate site ecological importance (SEI) for relevant faunal receptors and assessed potential impacts across three development scenarios: (1) development without mitigation, (2) development with mitigation, and (3) no additional development. Impacts were evaluated in terms of their duration, spatial extent, probability, and significance. The unmitigated scenario was found to present high risks to habitat-restricted and disturbance-sensitive species, particularly in moist seepage areas and along ecological corridors. By contrast, the mitigated development scenario, with carefully applied buffers, lighting control, visitor management, and habitat-sensitive layout, substantially reduces impact significance while enabling sustainable tourism expansion. The "no development" scenario, reflecting current tourism operations, also presents ongoing but lower-level ecological impacts.

This report recommends specific mitigation measures for each SCC and outlines best-practice guidance for managing potential problem animals around tourism infrastructure. Overall, the findings support a conservation-compatible development approach, provided that mitigation measures are fully implemented and monitored.

Introduction

This Species Specialist Assessment Report has been prepared for the proposed development of infrastructure and the expansion of tourist accommodation facilities at Rusty Gate Mountain Retreat, located on Farms 824, Rem. Farm 826, and Farm 887, within the Caledon District (refer to Figure 1).

A screening report conducted by the Department of Forestry, Fisheries and the Environment (DFFE) in April 2023 identified the site as having a 'High' sensitivity for the Animal Species Theme (Naylor 2023)(see Figure 2). Areas designated with high sensitivity require a Site Sensitivity Verification, and, depending on the results, either a Terrestrial Animal Species Compliance Statement or a Terrestrial Animal Species Specialist Assessment Report must be submitted.A Terrestrial Animal Species Compliance Statement, along with a Site Sensitivity Verification, was completed in July 2024 (Venter and Swart 2024). This current report has been prepared in accordance with the protocol established by the DFFE (2020) and presents the findings of a site visit conducted within the proposed development area (the study area). The site visit aimed to verify the presence, or potential presence, of Species of Conservation Concern (SCC) as identified by the DFFE screening tool.Seven animal species of concern were identified through the screening tool and are listed in Table 1. Additionally, CapeNature has highlighted the potential risk to two newly described frog species recently discovered in the region, specifically within the adjacent Riviersonderend Nature Reserve (also included in Table 1).

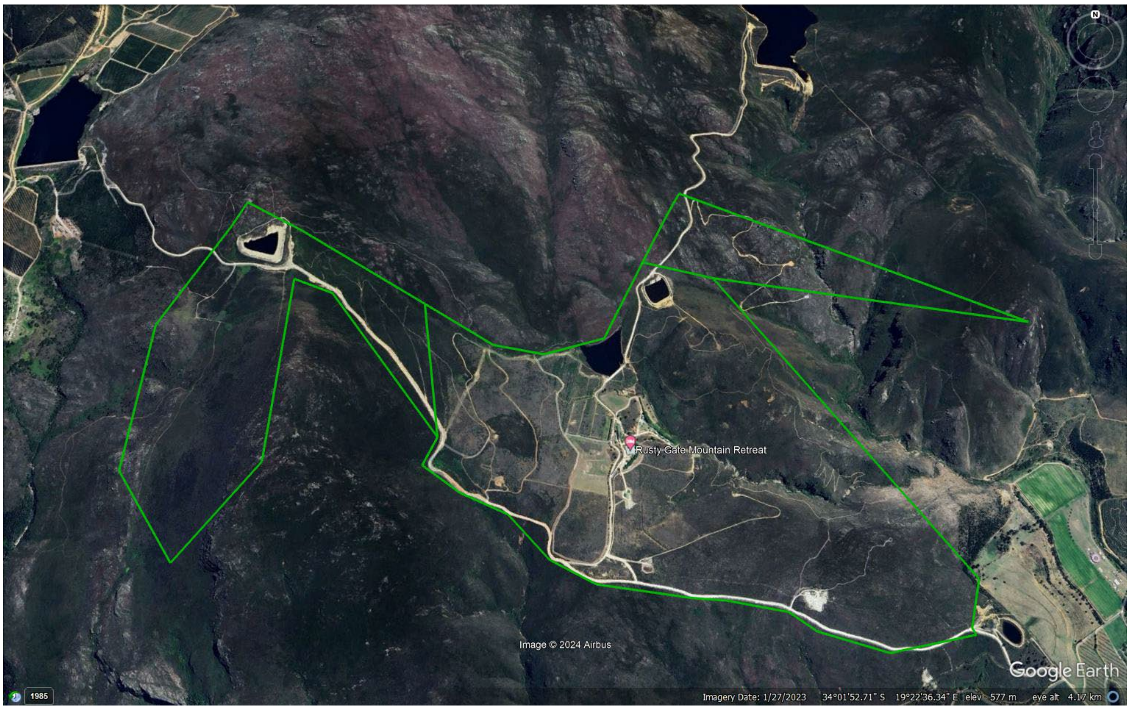

Figure 1: The cadastral boundary of the property (outlined in green) investigated during the site visit.

Table 1: Animal species of concern identified by the screening report (Naylor 2023). Two additional species were flagged by CapeNature for investigation.

Sensitivity	Species name	Common name	Order	Red List Status
High	*Sarothrura affinis*	Striped Flufftail	Avis	VU
Medium	*Circus maurus*	Black Harrier	Avis	EN
Medium	*Sagittarius serpentarius*	Secretary bird	Avis	EN
Medium	*Aquila verreauxii*	Verreaux's eagle	Avis	VU
Medium	*Conocephalus peringueyi*	Peringuey's Meadow Katydid	Invertebrate	VU
Medium	*Brinckiella aptera*	Mute Winter Katydid	Invertebrate	VU
Medium	*Aneuryphymus montanus*	Yellow winged agile grasshopper	Invertebrate	VU
*Unknown	*Capensibufo magistratus*	Landdroskop Mountain Toadlet	Amphibian	DD
*Unknown	*Arthroleptella atermina*	Riviersonderend moss frog	Amphibian	Unknown

* Two additional species were flagged by CapeNature for investigation.

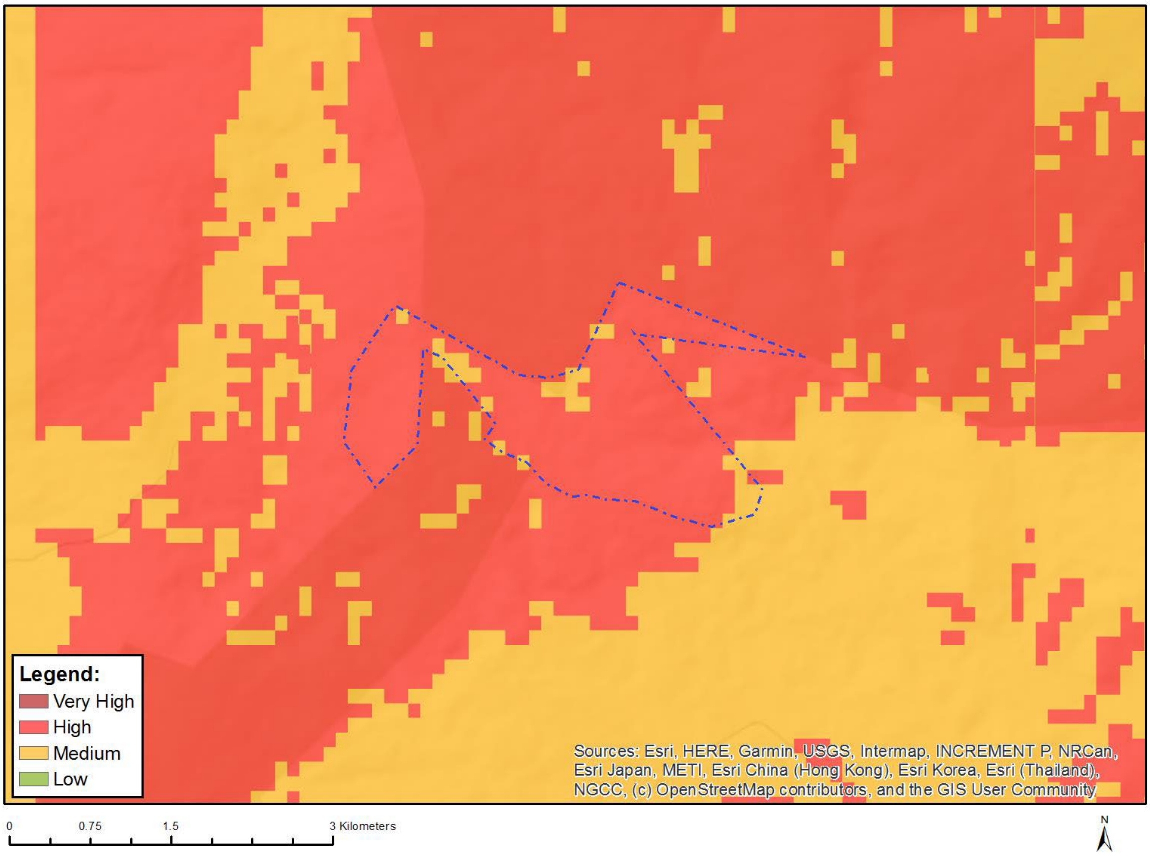

Figure 2: Map of the relative animal species theme sensitivity as per(Naylor 2023)

This report follows the legislative requirements set out by the National Environmental Management Act 107 of 1998 and specifically the regulations listed in the Government Gazette Notice No. 1150, Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species, October 2020.

Study Area

Rusty Gate Mountain Retreat, Farms 824, Rem. Farm 826 and Farm 887 (~286 ha.) is situated ±23 km northwest of the town Caledon, in the Western Cape Province (E 19°22'22"; S 34°00'37")(Figure 1). The majority ±60% of the property consist of natural mountainous Fynbos with the rest comprising of old fruit orchards and associated infrastructure (Figure 3). There are several man-made dams present fed by small natural streams and springs (Figure 4).

My overall impression during the site visit was that the property is in a moderately transformed state (due to past agricultural practises) with a considerable proportion that can be considered as 'natural' or 'pristine'.

The proposed new development at Rusty Gate Mountain Retreat comprises the development of the following (Figure 5):

- [2] Primary house
- [3] 6 x Camping sites
- [5] 2 x Self-catering pods
- [7] 2 x Self-catering eco cabins
- [8] 2 x Self-catering eco cabins
- [9] Open air amphitheatre
- [11] Occasional events camping area
- [12] Existing tourist accommodation
- [18] Existing events terrace
- [21] Existing workshop complex (to be converted into tourist facilities)
- [22] Conference facility (part of 21 above)
- [23] House to be converted to tourism use
- [24] Parking area
- [25] 6 x Self-catering eco cabins
- [26] Sundowner boma and firepit
- [27] 2 x Self-catering eco pods
- Each site will be serviced in the following manner:
    - Power supply: Each accommodation unit and the facilities at the camp site will be supplied with an off-grid solar PVC power generating system;
    - Water supply: Some accommodation units and the ablutions at the campsite will be connected via HDPE pipelines to the farm's potable water supply while other higher elevated sites (Sites 28, 27, 25 and 31) need to be provided with a tanker supply;
    - Sewerage: All effluent from the accommodation units and ablutions for the campsite will be discharged via a buried HDPE pipe leading to a conservancy tank which will be located at an accessible location for emptying by the landowner.

Figure 3: A large proportion of the property consist of natural mountain Fynbos with some remnants of old fruit orchards and associated infrastructure.

Figure 4: There are several man-made dams present on the property.

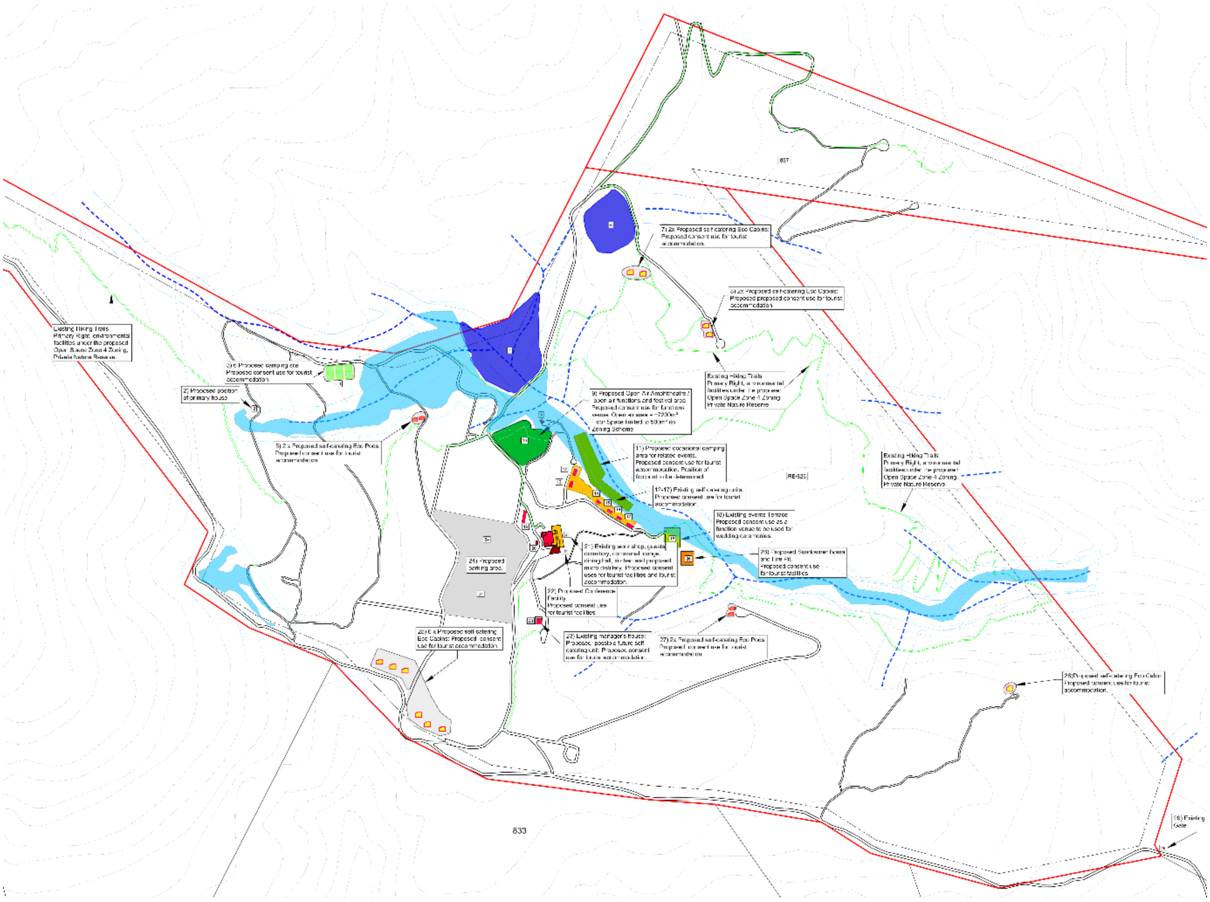

Figure 5: The development plan considered during the assessment for the development of infrastructure and expansion of the tourist accommodation facilities on Rusty Gate Mountain Retreat.

Methods

We followed the prescribed protocol for performing a Terrestrial Animal Site Sensitivity Verification Report according to the Government Gazette Notice 320 (Government Gazette 43110, 20 March 2020), and amended in Government Gazette Notice 3717 (Government Gazette 49028, 28 July 2023). We followed the SANBI (2020) species environmental assessment guidelines during the assessment.

This report's findings are based on:

- ❖ A desktop study to determine the presence of animal species of concern (as listed in Table 1) and other species at the study area; and
- ❖ 1 x Field site visit.

The desktop study included the use of iNaturalist and Global Biodiversity Information Framework (GBIF) records as well as reports, field guides and scientific literature. These records were used to determine the species recorded in the area and the presence of potential SCC, with particular emphasis on the SCC listed by the screening tool.

During the site survey, species and signs of presence (sounds, tracks, scats etc), observed were recorded. Surveys consisted of meandering visual, acoustic surveys and point surveys performed at and between the various proposed development sites. We covered the property on foot and with a vehicle (Figure 6 and Table 2). We used territorial call playbacks to determine the presence of striped flufftail. We used sweep netting to search for target insects. The main purpose of the site visit was to confirm whether:

- any of the listed SCC were present in the proposed development area;
- the proposed site for the development would act as a corridor for any of the SCC highlighted by the screening tool;
- whether the vegetation (indigenous and planted) at the proposed development site likely supports undetected individuals or populations of the SCC highlighted by the screening tool; and
- there are any SCC present at the site that were not highlighted by the initial screening.

To aid in record-keeping of the site and species observed, photographs were taken during the site visits.

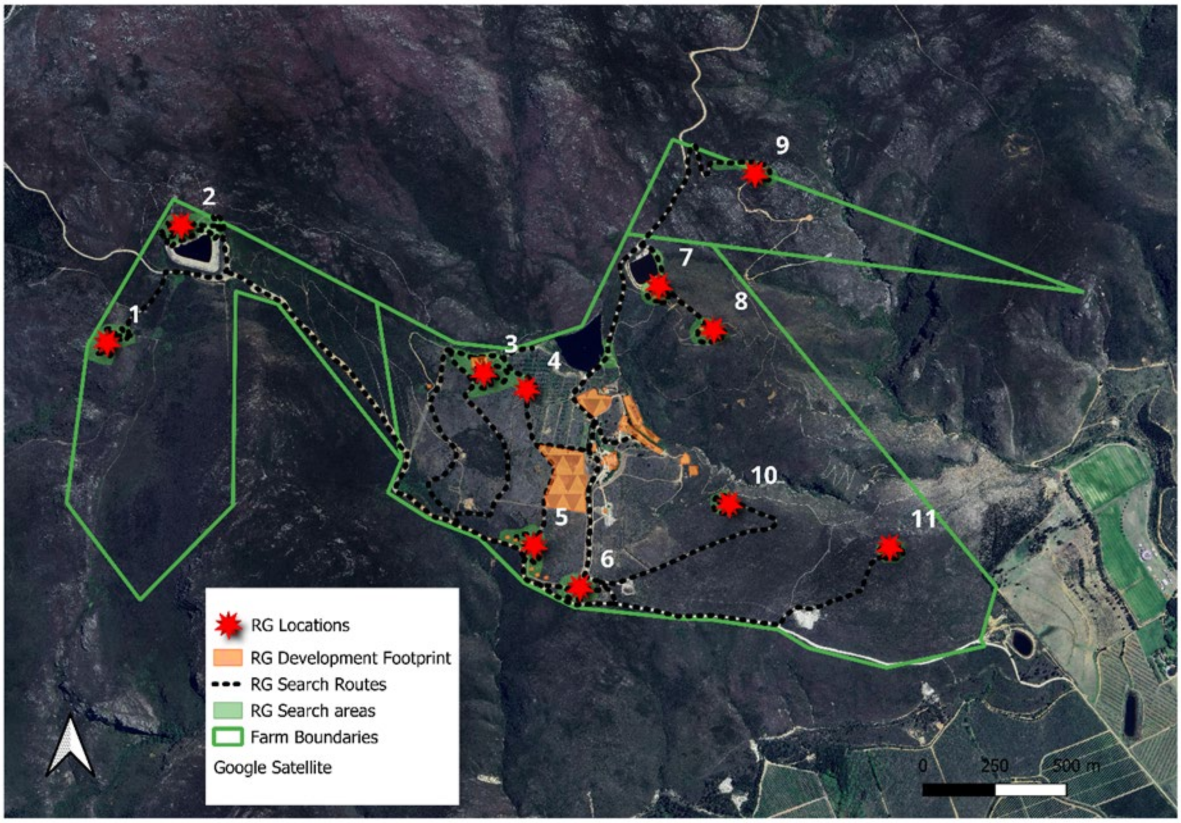

Figure 6: A map indicating the areas within the property investigated during the site visit. Green areas indicate areas of intensive searches.

Setting the project area of influence (PAOI)

The property intended for development is fairly small (±110 ha). The PAOI was set considering main SCC we think are present on or close to the development footprint. This was based on recommended buffers for SCC (SANBI 2020) and WCDS expert knowledge.

Table 2: Site coordinates

Site	Coordinates, Decimal Degrees
Location 1	S 31° 01' 50"; E19° 21' 39"
Location 2	S 34° 01' 37"; E 19° 21' 48"
Location 3	S 34° 01' 53"; E 19° 22' 29"
Location 4	S 34° 01' 57"; E 19° 22' 34"
Location 5	S 34° 02' 13"; E 19° 22' 13"
Location 6	S 34° 02' 18"; E 19° 22' 40"
Location 7	S 34° 01' 45"; E 19° 22' 53"
Location 8	S 34° 01' 50"; E 19° 22' 59"
Location 9	S 34° 01' 32"; E 19° 23' 01"
Location 10	S 34° 02' 09"; E 19° 23' 01"
Location 11	S 34° 02' 14"; E 19° 23' 24"

Evaluation of Site Ecological Importance (SEI)

In order to spatially assess the different areas of importance for a species for the proposed development site we used the SEI approach, see SANBI (2020) for identifying the site-based ecological importance for species, in relation to the proposed PAOI. The SEI is a function of the biodiversity importance (BI) of the receptor (e.g. species of conservation concern, the vegetation/fauna community, habitat type or ecological process present on the site) and its resilience to impacts (receptor resilience [RR]) and is calculated as follows (SANBI 2020):

$$SEI = BI + RR$$

BI in turn is a function of conservation importance (CI) and the functional integrity (FI) of the receptor is calculated as follows:

$$BI = CI + FI$$

Conservation importance (*CI*) is evaluated in accordance with recognised established internationally acceptable principles and criteria for the determination of biodiversity-related value. Conservation importance is defined here as (SANBI 2020)(Tabe 3): *"The importance of a site for supporting biodiversity features of conservation concern present, e.g. populations of IUCN threatened and Near Threatened species (CR, EN, VU and NT), Rare species, range-restricted species, globally significant populations of congregatory species, and areas of threatened ecosystem types, through predominantly natural processes."*

Functional integrity (*FI*) of the receptor (e.g. the vegetation/fauna community or habitat type) is defined here as the receptors' current ability to maintain the structure and functions that define it, compared to its known or predicted state under ideal conditions. Simply stated, FI is (SANBI 2020)(Table 4): *"A measure of the ecological condition of the impact receptor as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts."*

Table 3: Conservation importance (CI) criteria (SANBI 2020)

Conservation importance	Fulfilling criteria
Very High	Confirmed or highly likely occurrence of CR, EN, VU or Extremely Rare23 or Critically Rare24 species that have a global EOO of < 10 km2. Any area of natural habitat25 of a CR ecosystem type or large area (> 0.1% of the total ecosystem type extent26) of natural habitat of EN ecosystem type. Globally significant populations of congregatory species (> 10% of global population).
High	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km2. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining. Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type. Presence of Rare species. Globally significant populations of congregatory species (> 1% but < 10% of global population).
Medium	Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals. Any area of natural habitat of threatened ecosystem type with status of VU. Presence of range-restricted species. > 50% of receptor contains natural habitat with potential to support SCC.
Low	No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC.
Very low	No confirmed and highly unlikely populations of SCC. No confirmed and highly unlikely populations of range-restricted species. No natural habitat remaining.

Table 4: Functional Integrity (FI) criteria (SANBI 2020)

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

Receptor resilience (RR) is defined here as (SANBI 2020)(Table 5): *"The intrinsic capacity of the receptor to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention."* The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor.

Table 5: Resilience criteria (SANBI 2020)

Resilience	Fulfilling criteria
Very High	Habitat that can recover rapidly (~ less than 5 years) to restore > 75%28 of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a very high likelihood of returning to a site once the disturbance or impact has been removed.
High	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Medium	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a moderate likelihood of returning to a site once the disturbance or impact has been removed.
Low	Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a low likelihood of returning to a site once the disturbance or impact has been removed.
Very Low	Habitat that is unable to recover from major impacts, or species that are unlikely to remain at a site even when a disturbance or impact is occurring, or species that are unlikely to return to a site once the disturbance or impact has been removed.

Evaluation of the SEI in the context of the proposed development activities are then categorised in a final risk category (SANBI 2020)(Table 6).

Table 6: Interpreting SEI in the context of the proposed development activities (SANBI 2020)

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

Impact Assessment Methodology for Faunal Receptors

To evaluate the potential faunal impacts of the proposed development, a structured impact assessment framework was applied, consistent with the guidelines provided by SANBI (2020) and the national protocol for specialist assessments under the National Environmental Management Act (NEMA). Potential impacts were identified for each species of conservation concern (SCC) listed in the DFFE screening tool, supplemented by site-specific observations during field surveys. For each identified receptor, impacts were assessed across three alternative scenarios: (1) development without mitigation, (2) development with the full suite of proposed mitigation measures implemented, and (3) no development. Each impact was evaluated in terms of its nature, duration, spatial extent, probability of occurrence, and overall significance, with careful consideration of the receptor's ecological role, conservation status, habitat requirements, and sensitivity to disturbance. This comparative approach allows for a transparent and evidence-based understanding of the ecological trade-offs associated with development and supports sound environmental decision-making.

Conditions, limitations, and assumptions

The findings and recommendations of this report are based on WCDS best scientific and professional knowledge, literature and other data sources. WCDS reserve the right to modify aspects of the report, including the recommendations and conclusions, if additional relevant information becomes available.

The conditions, e.g. weather and otherwise, during the assessment period could have a significant influence determining whether animal species will be found on site or not. An animal species absence during field assessments does not necessarily mean it is not present at assessment locations. At WCDS we use an evidence-based approach to provide the best possible assessment of species presence and potential impacts.

Results

Field survey conditions

A site visit was performed on the 4th and 5th of July 2024, where both nocturnal (between 19:00 and 23:00) and diurnal (between 7h00 and 12h00) surveys were performed. On the 4th the conditions were cold, windy and wet. The following day the weather improved, and conditions were cool but sunny with moderate wind.

Project area of influence (PAOI)

The development property is small (~286 ha). The PAOI covers ~60% of the property (Figure 7 and Table 7).

Table 7: The PAOI was set considering main SCC we think are present on or close to the development footprint.

Species/Group	PAOI Buffer size	Notes
Large mammals, raptors and birds general	300 m	Foraging and breeding habitat
Nocturnal insects	250 m	Influence of artificial light
Small mammals, herpetofauna and diurnal insects	100 m	Foraging and breeding habitat

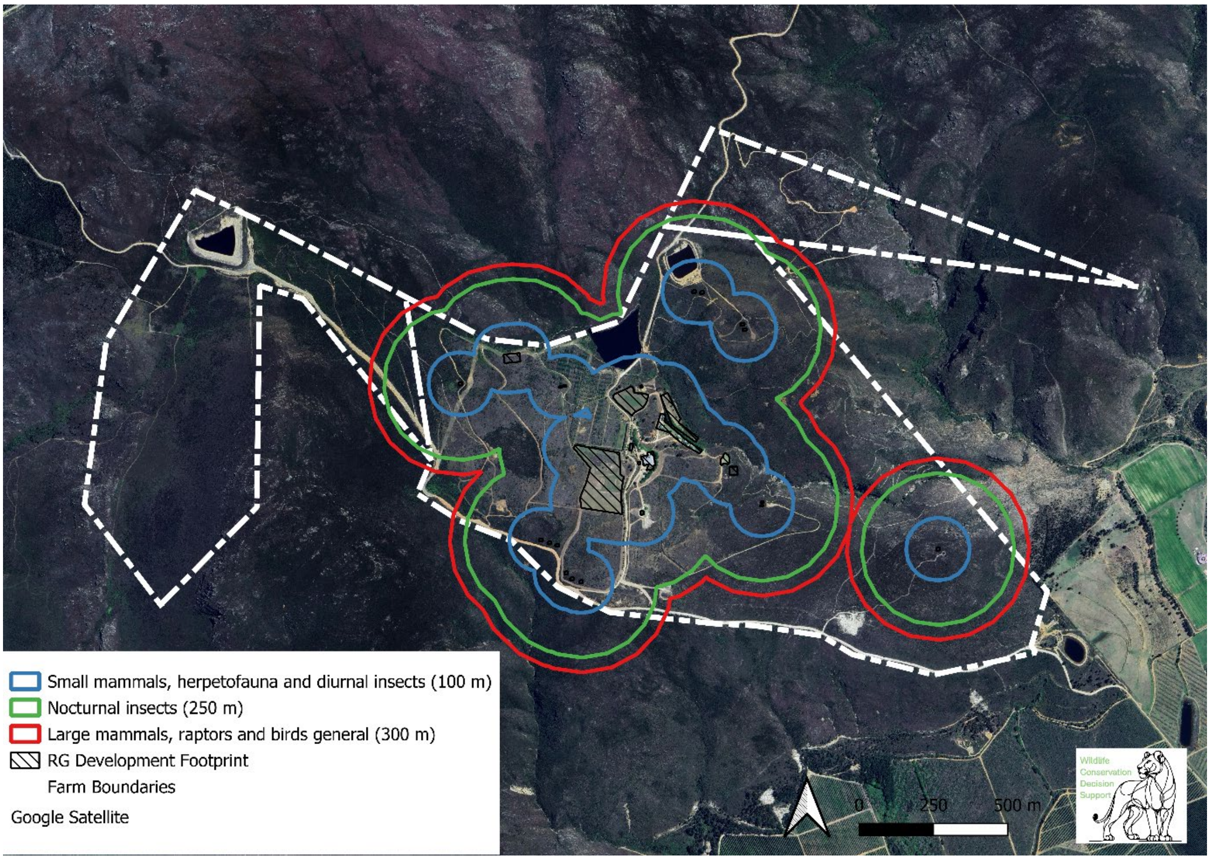

Figure 7: The PAOI was set considering main SCC we think are present on or close to the development footprint (see Table 7 for buffer distances).

Habitat descriptions.

After screening the development site using Google Earth images and on-site verification, we decided to do intensive searches at each proposed development site and additional sites of interest of specific representative or seemingly important locations (see Figure 6) within the development area. The specific site habitat descriptions will be dealt with as they are located from west to east.

Location 1

This location is on the western side of the property and one of the higher elevation sites (>780 masl) (S 31° 01′ 50″; E19° 21′ 39″)(Figure 6). The area is dominated by natural mountain Fynbos with occasional scattered exotic *Pinus* sp. (Figure 9 & 10). A seepage area is situated between the road and the rocky outcrop to the east (Figure 8). At the times (day & night) of visit it was fairly cold and a fresh wind was blowing but we did observe some birdlife and orthopteran fauna (Table 2).

Figure 8: Location 1 is dominated by natural Fynbos.

Figure 9: The seepage area to the east of Location 1.

Figure 10: Location 1 is situated on a rocky outcrop on the western boundary of the property.

We observed (visually and acoustic) 2 different bird species at this location, and a species of Orthoptera (Table 8).

Table 8: Animal species observed at Location 1

Group	Species	Notes	Status
Birds:	Cape crow *Corvus capensis*	Flying to the south of location	Least Concern
	Cape grassbird *Sphenoeacus afer*	At location	Least Concern
Invertebrates:	*Thericlesiella meridionalis*	Netted at site	Unknown

Location 2

This location is situated in the west of the property and is the highest elevated site (>830 masl) (S 34° 01’ 37”; E 19° 21’ 48”)(Figure 6). The area is dominated by natural mountain Fynbos (Figure 11) with a man-made dam to the south (Figure 11). Stands of *Protea neriifolia* harbours several nectivorous bird species close to this site. We found a Little karoo dwarf chameleon, *Bradypodion gutturale* (Figure 12) at the dam and clicking stream frogs, *Strongylopus fasciatus* could be heard at the dam during the evening survey (Table 9). We also noted the presence of orthopteran fauna (Table 9).

Figure 11: A photo taken standing at the development site looking down on the man-made dam.

Figure 12: We found a Little karoo dwarf chameleon, Bradypodion gutturale at the dam during the nocturnal survey.

Table 9: Animal species observed at Location 2.

Group	Species	Notes	Status
Birds:	Orange breasted sunbird *Anthobaphes violacea*	Observed on protea stand close to site	Least Concern
	Cape sugar bird *Promerops cafer*	Observed on protea stand close to site	Least Concern
	Cape crow *Corvus capensis*	Observed flying over site	Least Concern
Amphibians:	Striped stream frog *Strongylopus fasciatus*	Heard in dam	Least Concern
Reptiles:	Robertson dwarf chameleon *Bradypodion gutturale*	Found close to dam wall	Least Concern
Invertebrates:	*Thericlesiella meridionalis*	Netted at site	Unknown

Location 3

This site is situated towards the middle of the property but on the northern boundary (S 34° 01' 53"; E 19° 22' 29")(Figure 6). It is adjacent to a firebreak and below a rocky edge with a man-made dam about 200 m to the east (Figure 13 and 14). There are some stands of *Protea neriifolia* but the site is dominated by *Seriphium plumosum, Helichrysum cymosum* and *H. patulum* (Helme 2024). The site is located to the west of a hillslope seep (Steytler 2024). A couple of bird species was observed and Striped flufftail, *Sarothrura affinis* responded to the call-up at this site (Table 10).

Figure 13: Location 3 vegetation taken standing in the firebreak.

Figure 14: The view from site 3A down the firebreak towards the dam.

Table 10: Animal species observed at Location 3

Group	Species	Notes	Status
Birds:	Orange breasted sunbird *Anthobaphes violacea*	Observed on protea stand close to site	Least Concern
	Cape sugar bird *Promerops cafer*	Observed on protea stand close to site	Least Concern
	Cape spurfowl *Pternistis capensis*	Observed in firebreak	Least Concern
	Striped flufftail *Sarothrura affinis*	Responded to callup, from the seep to the south	**Vulnerable, Decreasing**
Mammals:	Cape hare *Lepus capenis*	Observed in firebreak	Least Concern
	Cape Porcupine *Hystrix africaeaustralis*	Scat observed in firebreak	Least Concern

Location 4

This location is situated about 150 m south east of site Location 3 (S 34° 01’ 57”; E 19° 22’ 34”)(Figure 6). There is a hillslope seep to the north and northwest of this site (Steytler 2024). This site is situated next to an old fruit orchard (Figure 15). Dominant plants in this site are *Seriphium plumosum*, *Helichrysum cymosum* and *H. patulum* (Helme 2024). A couple of bird, amhibian and mammal species was observed at this site including Verreaux’s eagle, *Aquila verreauxii* and Striped flufftail, *Sarothrura affinis* (Table 11).

Figure 15: Location 4 is situated to the left of the road with the remnant fruit orchards which can be seen on the right.

Table 11: Animal species observed at Location 4.

Group	Species	Notes	Status
Birds:	Greater double collared sunbird *Cinnyris afer*	Observed on site	Least Concern
	Cape sugarbird *Promerops cafer*	Observed on site	
	Cape grass bird *Sphenoeacus afer*	Observed in old orchard	Least Concern
	Cape spurfowl *Pternistis capensis*	Observed in road	Least Concern
	Striped flufftail *Sarothrura affinis*	Responded to callup, from the seep to the north	**Vulnerable, Decreasing**
	Southern boubou *Laniarius ferrugineus*	Observed in old orchard	Least Concern
	Egyptian goose *Alopochen aegyptiaca*	Fly by towards dam in the east	Least Concern
	Cape bulbul *Pycnonotus capensis*	Observed in old orchard	Least Concern
	Cape turtle dove *Streptopelia capicola*	Heard close to site	Least Concern
	Bokmakierie *Telophorus zeylonus*	Observed on site	Least Concern
	Verreaux's eagle *Aquila verreauxii*	Observed flying above site	**Vulnerable, Stable**
Mammals:	Cape hare *Lepus capenis*	Observed in firebreak	Least Concern
	Cape Porcupine *Hystrix africaeaustralis*	Scat observed in firebreak	Least Concern
Amphibians:	Clicking stream frog *Strongylopus grayii*	Vocal in pool on roadside	Least Concern
	Cape river frog *Amietia fuscigula*	At dam overflow 200 m to east of site	Least Concern
	Bronze caco *Cacostrenum nanum*	Vocal in pool on roadside	Least Concern

Location 5

This location is also situated in the central part of the property but closer to the southern border (S 34° 02’ 13”; E 19° 22’ 13”)(Figure 6). The site is dominated by dense and very old, vegetation e.g. *Protea neriifolia, Passerina corymbosa, Psoralea spicata, Osteospermum moniliferum, Metalasia densa, Leucadendron tinctum, L. laureolum, Erica hispidula, E. plukenetii* and *E. vestita* (Helme 2024) (Figure 16). A couple of nectivorous bird species was observed at this site (Table 12).

Table 12: Animal species observed at Location 5.

Group	Species	Notes	Status
Birds:	Orange breasted sunbird *Anthobaphes violacea*	Observed on protea stand close to site	Least Concern
	Cape sugar bird *Promerops cafer*	Observed on protea stand close to site	Least Concern
	Cape grass bird *Sphenoeacus afer*	Observed on protea stand close to site	Least Concern

Figure 16: Location 5 are dominated by very old Fynbos vegetation.

Location 6

This location is also situated in the central part of the property but closer to the southern border (S 34° 02’ 18”; E 19° 22’ 40”)(Figure 6). The site is similar to Location 5 with very old, dense vegetation dominated by *Protea neriifolia, Passerina corymbosa, Psoralea spicata, Osteospermum moniliferum, Metalasia densa, Leucadendron tinctum, Erica hispidula, E. plukenetii* and *E. vestita* (Helme 2024)(Figure 15). There is a bonnox game fence present at this site. A couple of nectivorous bird species and one mammal species was observed at this site (Table 13).

Table 13: Animal species observed at Location 6

Group	Species	Notes	Status
Birds:	Orange breasted sunbird *Anthobaphes violacea*	Observed on protea stand close to site	Least Concern
	Cape sugar bird *Promerops cafer*	Observed on protea stand close to site	Least Concern
Mammal:	Cape hare *Lepus capenis*	Observed in firebreak	Least Concern

Figure 17: Location 6 are dominated by very old Fynbos vegetation and in a camp fenced by Bonnox.

Location 7

This site is situated in the north-eastern part of the property but close to a man-made dam (S 34° 01’ 45”; E 19° 22’ 53”)(Figure 6). Plant species found here are *Dicerothamus rhinocerotis,* *Helichrysum patulum, H. cymosum, Anthospermum aethiopicum, Erica cruenta, Searsia angustifolia, Osteospermum moniliferum, Tetraria sp.,* and *Athanasia trifurcate* (Helme 2024)(Figure 18). Below the dam-wall we observed Southern double-collared sunbird *Cinnyris chalybeus* in stands of *Protea neriifolia* (Table 14).

Table 14: Animal species observed at Location 7

Group	Species	Notes	Status
Birds:	Southern double-collared sunbird *Cinnyris chalybeus*	Observed on protea stand close to site	Least Concern

Figure 18: The view from location 7 indicating the vegetation and location of the man-made dam.

Location 8

This site is situated in the north-eastern part of the property a couple of hundred meters south-east of site 6 (S 34° 01’ 50”; E 19° 22’ 59”)(Figure 6). Vegetation are dominated by *Protea neriifolia* and *Tenaxia stricta* (Helme 2024)(Figure 19). No fauna was observed at this site.

Figure 19: Vegetation are dominated by Protea neriifolia and Tenaxia stricta at location 8.

Location 9

This site is situated in the north-eastern part of the property (S 34° 01' 32"; E 19° 23' 01")(Figure 6). Vegetation are dominated by *Protea neriifolia, Hypodiscus aristatus, Elegia hookeriana, Penaea mucronata, Cliffortia obovata, Erica corifolia, E. vestita, Mimetes cucullatus, Protea repens, Dilatris pillansii, Leucadendron salignum* and *Wachendorfia paniculata* (Helme 2024) (Figure 20). A steep road vulnerable to erosion leads to this site. At the time of the visit the road was washed away. A couple of bird species and orthopteran fauna was observed at this site (Table 15).

Table 15: Animal species observed at Location 9

Group	Species	Notes	Status
Birds:	Orange breasted sunbird *Anthobaphes violacea*	Observed on protea stand close to site	Least Concern
	Cape sugar bird *Promerops cafer*	Observed on protea stand close to site	Least Concern
	Cape grass bird *Sphenoeacus afer*	Observed on protea stand close to site	Least Concern
	Cape crow *Corvus capensis*	Observed flying over site	Least Concern
Invertebrates:	*Thericlesiella meridionalis*	Netted at site	Unknown

Figure 20: The vegetation and prominent rocky feature at location 9.

Location 10

This site is situated in the south-eastern part of the property (S 34° 02’ 09”; E 19° 23’ 01”)(Figure 6). Vegetation are dominated by *Leucadendron salignum, Searsia rosmarinifolia, Protea repens, Berkheya herbacea, Erica sp., Phaenocoma prolifera, Hypodiscus aristatus, H. striatus, Asparagus rubicundus, Serruria phylicoides* and *Penaea mucronate* (Helme 2024)(Figure 21). There is a non-perennial drainage line and associated riparian habitat approximately 50 m downslope to the north-west of this this site (Steytler 2024)(Figure 21). A couple of bird species was observed at this site and Striped flufftail, *Sarothrura affinis* responded to the call-up from the adjacent drainage line (Table 10). Cape mountain rainfrog *Breviceps montanus* vocalized in the area of the development site. An orthopteran species was sampled from the site (Table 16).

Table 16: Animal species observed at location 10

Group	Species	Notes	Status
Birds:	Orange breasted sunbird *Anthobaphes violacea*	Observed on protea stand close to site	Least Concern
	Cape sugar bird *Promerops cafer*	Observed on protea stand close to site	Least Concern
	Cape grass bird *Sphenoeacus afer*	Observed on protea stand close to site	Least Concern
	Cape crow *Corvus capensis*	Observed flying over site	Least Concern
	Striped flufftail *Sarothrura affinis*	Responded to callup, from the drainage line to the north	**Vulnerable, Decreasing**
Amphibians:	*Cape mountain rainfrog Breviceps montanus*	Vocalized in and around site	Least Concern
Invertebrates:	*Thericlesiella meridionalis*	Netted at site	Unknown

Figure 21: The dominant vegetation at location 10 with a drainage line in the background.

Location 11

This location is at the south-eastern edge of the property on a north-facing (S 34° 02' 14"; E 19° 23' 24")(Figure 6). The vegetation at this site is diverse and dominated by *Protea repens, P. neriifolia, Erica sp., Hypodiscus aristatus, Anthospermum aethiopicum, Tetraria sp., Otholobium spissum, Berkheya herbacea, Thamnochortus lucens, Lobelia chamaepitys* and *Senecio pinifolius* (Figure 20). A couple of bird species was observed here and Cape mountain rainfrog *Breviceps montanus* also vocalized at this site (Table 17). Two orthopteran species were sampled during sweep netting, identified and released.

Table 17: Animal species observed at location 11

Group	Species	Notes	Status
Birds:	Orange breasted sunbird *Anthobaphes violacea*	Observed on protea stand close to site	Least Concern
	Cape sugar bird *Promerops cafer*	Observed on protea stand close to site	Least Concern
	Cape grass bird *Sphenoeacus afer*	Observed on protea stand close to site	Least Concern
	Little swift *Apus affinis*	Observed flying over site	Least Concern
Amphibians:	*Cape mountain rainfrog Breviceps montanus*	Vocalized in and around site	Least Concern
Invertebrates:	*Thericlesiella meridionalis*	Netted at site	Unknown
	Megalotheca sp.	Netted at site	Unknown

Figure 22: The dominant vegetation at location 11 which is situated at the edge of small cliffs looking down into a kloof.

Location 12

This location is also situated in the central part of the property but closer to the southern border (S 34° 01' 36"; E 19° 22' 20")(Figure 6). This site is east facing and then vegetation on site is old, and dominated by dense *Protea neriifolia* (Helme 2024). This site was not visited (see comment on page 10) but we did drive past it on the way to location 3 and 4. The dense protea veld is similar to that of location 5. There was no high concern on potential impact on any of the listed SCC's.

Animal species of concern

A total of nine animal species of concern was identified by the screening tool (Naylor 2023)(Table 2). Two additional SCC's was identified through the desk top study (Table 18) which are dealt with under the section about 'Large mammal landscape connectivity'. The following section deals with the site's potential importance for these species and the probability of them being present in habitats in the development area.

Table 18: Other notable animal species likely to occur at the property identified by the desktop survey.

Group	Species	Notes	Status
Mammals:	Leopard, *Panthera pardus*	See McManus et al. (2022) and Swanepoel et al. (2016)	**Vulnerable**
	Grey rhebok, *Pelea capreolus*	See Taylor et al. (2016)	**Near Threatened**

Potential Impacts on Large Mammal Landscape Connectivity

The Rusty Gate property, situated within the Cape Floristic Region adjacent to the Riviersonderend Provincial Nature Reserve, occupies an ecologically strategic location. According to the Western Cape Biodiversity Spatial Plan (Pool-Stanvliet et al. 2017), the southeastern section of the proposed development area intersects Critical Biodiversity Areas (CBA1) and Ecological Support Areas (ESA1) (Figure 23). These zones provide critical ecological connectivity between the nature reserve, declared mountain catchment areas, and surrounding fynbos ecosystems. Maintaining landscape connectivity in this context is particularly important for the persistence of large mammal species, including those of conservation concern such as leopard (*Panthera pardus*) and grey rhebok (*Pelea capreolus*)(Swanepoel et al. 2016, Taylor et al. 2016).

Connectivity is essential for facilitating dispersal, gene flow, seasonal migrations, and resource access for large mammals (Baguette and Van Dyck 2007). Fragmentation resulting from development activities could disrupt these ecological processes, leading to population isolation, increased human-wildlife conflict, and greater vulnerability to stochastic events (Baguette and Van Dyck 2007).

Importance of the Landscape for Large Mammals

Leopards, although wide-ranging and adaptable, are heavily reliant on connected landscapes for movement, hunting, and genetic exchange (McManus et al. 2022). In the Western Cape, leopards occupy fragmented habitats and often depend on corridors linking protected areas (Swanepoel et al. 2016, McManus et al. 2022). Disruption of these movement routes through habitat transformation can further exacerbate the regional decline of this Vulnerable species. Current evidence suggests that leopards outside protected areas have significantly lower survival rates, largely due to increased human-wildlife conflict and habitat loss (Swanepoel et al. 2016).

Similarly, grey rhebok, listed as Near Threatened, are endemic to South Africa and depend on rocky grasslands and montane fynbos for survival. Recent assessments report a 20% decline in populations over three generations, attributed to habitat loss, hunting pressure, and habitat fragmentation (Taylor et al. 2016). Although the grey rhebok has shown some resilience in fynbos systems (Jansen van Vuuren et al. 2022), maintenance of habitat connectivity is crucial for sustaining viable metapopulations. The local antelope assemblage, including species such as Cape grysbok (*Rhaphicerus melanotis*) and bushbuck (*Tragelaphus sylvaticus*), also reflects varying levels of reliance on natural versus anthropogenically altered landscapes (Jansen van Vuuren et al. 2022). However, even species adaptable to fragmented landscapes require access to intact natural habitat patches and corridors to ensure long-term viability.

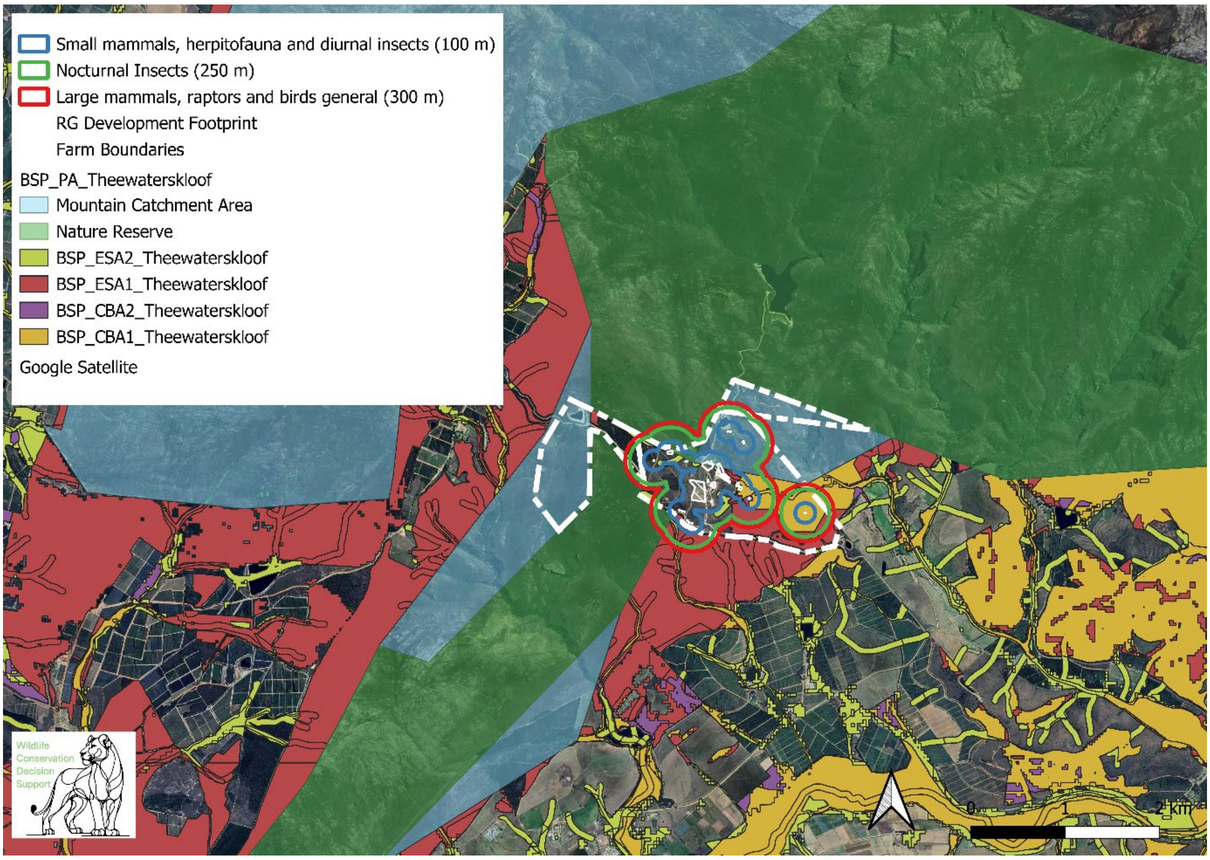

Figure 23: The development footprint in relation to critical biodiversity, ecological support areas, formal protected areas and water catchment areas.

Potential Influence of Recreational Activities on Large Mammal Connectivity

The development of tourism facilities at Rusty Gate is anticipated to increase human presence in the area, which could influence the behavior and movement patterns of large mammal species. Research has shown that recreational activities can result in spatial and temporal shifts in wildlife activity, particularly among species sensitive to disturbance, such as leopards and grey rhebok (Salvatori et al. 2023, Sganzerla et al. 2025). Mammals may respond to increased human activity by altering their habitat use, shifting their activity to nocturnal periods, or adjusting their movement corridors. These changes can have implications for functional landscape connectivity, particularly in areas linking protected areas such as the Riviersonderend Provincial Nature Reserve. However, international studies also indicate that with appropriate management interventions, such as maintaining undeveloped corridors, regulating visitor access, and minimizing infrastructure within critical areas, it is possible to support both wildlife conservation and sustainable tourism objectives (Salvatori et al. 2023). The success of such interventions typically depends on proactive spatial planning, visitor management strategies, and the design of infrastructure to facilitate wildlife movement. Therefore, integrating ecological considerations into the planning and operational phases of the Rusty Gate development will be important to maintain its role in supporting large mammal connectivity within the Cape Floristic Region.

Implications of Site Selection for Large Mammal Connectivity and Behaviour

The development units proposed at Rusty Gate are located within a mosaic of planning categories. Development Unit 27 lies entirely within a CBA1 area identified due to its terrestrial vegetation importance (Pool-Stanvliet et al. 2017, Helme 2024). Development Units 18 and 26 occur within ESA2 areas, while most other units fall into unclassified zones either because they overlap previously disturbed areas or because they are situated in South Sonderend Sandstone Fynbos, a habitat classified as Least Concern (Pool-Stanvliet et al. 2017).

Although unclassified areas may not individually be flagged as conservation priorities, collectively they contribute to broader landscape permeability. The Species Environmental Assessment Guidelines (SANBI 2020) emphasize that even transformed or low-sensitivity areas can serve as stepping stones or buffer zones that support species movement, particularly for wide-ranging mammals.

From a large mammal connectivity and behaviour perspective, the current layout of the proposed development sites primarily affects the central areas of the property, which are not critical for maintaining landscape linkages (Figure 23). As a result, the development is expected to pose a low risk of disrupting connectivity for non-sedentary large mammal species, particularly those not dependent on highly localized habitat conditions. It is therefore reasonable to conclude that the proposed tourism facilities are unlikely to significantly impact large-scale mammal movement patterns (Table 19). However, potential behavioural responses, such as altered activity patterns or localized avoidance, may occur following development (Table 20). Careful post-construction management and monitoring will be important to minimize disturbance and ensure that behavioural impacts do not accumulate over time (See section on impact mitigation).

Table 19: Evaluation of site ecological importance (SEI) in terms of connectivity (the receptor) for large mammal species of conservation concern for the proposed development, see evaluation criteria (SANBI 2020). SEI is classified as 'low'.

Biodiversity importance		Conservation importance				
		Very high	High	Medium	Low	Very low
Functional integrity	Very high	Very high	Very high	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

Site ecological importance (SEI)		Biodiversity importance				
		Very high	High	Medium	Low	Very low
Receptor resilience	Very low	Very high	Very high	High	Medium	Low
	Low	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	High	Medium	Medium	Low	Low	Very low
	Very high	Medium	Low	Very low	Very low	Very low

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

Table 20: Evaluation of site ecological importance (SEI) in terms of impact on animal behaviour (the receptor) for large mammal species of conservation concern for the proposed development, see evaluation criteria (SANBI 2020). SEI is classified as 'low.

Biodiversity importance		Conservation importance				
		Very high	High	Medium	Low	Very low
Functional integrity	Very high	Very high	Very high	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

Site ecological importance (SEI)		Biodiversity importance				
		Very high	High	Medium	Low	Very low
Receptor resilience	Very low	Very high	Very high	High	Medium	Low
	Low	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	High	Medium	Medium	Low	Low	Very low
	Very high	Medium	Low	Very low	Very low	Very low

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

Potential Importance of Rusty Gate for Striped Flufftail (Sarothrura affinis) and Likelihood of Occurrence

The Striped Flufftail (*Sarothrura affinis*) is a regionally scarce and cryptic grassland specialist whose population is suspected to be declining due to habitat loss across its range (Peacock et al. 2015). An estimated 10% or more of the South African population may have been lost, largely due to pressures such as inappropriate fire regimes, heavy grazing, agricultural expansion, and afforestation (Peacock et al. 2015). In the Western Cape, the species typically inhabits dense patches of *Psoralea-Osmitopsis* Fynbos adjacent to streams and moist depressions (Graham and Ryan 1984, Kakebeeke 1993).

Although occurrence records for the species in the immediate vicinity of Rusty Gate are limited, databases such as iNaturalist and GBIF include several observations approximately 40 km away near Grabouw, and notably, one GBIF record falls within a 5 km radius of the property. Field surveys conducted for this assessment also confirmed the presence of Striped Flufftail vocal responses to playback calls at sites 3, 5, 26 and 27 on Rusty Gate, particularly along drainage lines and moist habitats e.g. along the large seep that stretches between these areas (Figure 24).

The presence of calling birds during surveys, combined with the proximity of previous records and the availability of structurally suitable habitat, indicates that Rusty Gate likely forms part of the local landscape network supporting this species. Taylor (1994) notes that Striped Flufftails are sedentary in low-altitude grasslands but undertake altitudinal or local movements from higher-altitude habitats during winter in search of better foraging conditions. Their habitat selection is influenced by the availability of dense ground cover and sufficient invertebrate prey. Importantly, although the species is tolerant of periodic burning when appropriately timed, the timing and frequency of burns can critically affect habitat suitability if post-fire vegetation regrowth does not align with breeding periods (Taylor 1994).

Based on the findings of Taylor (1994), the estimated average territory size for a breeding pair is approximately 1.3 hectares, with a broader home range of around 2.25 hectares. Territories are multipurpose, providing foraging grounds, nesting sites, and shelter within compact areas of suitable vegetation. Field observations suggest that factors such as altitude, slope, and specific vegetation types exert relatively minor influence on territory size, provided sufficient ground cover and moisture availability exist. Drainage lines and areas with dense fynbos cover are particularly important and are typically located within 50–100 meters of core activity areas. Given these small-scale habitat requirements, relatively limited moist habitat patches at Rusty Gate could sustain individual territories or contribute to a mosaic of territories, particularly in the main seep area and its tributaries.

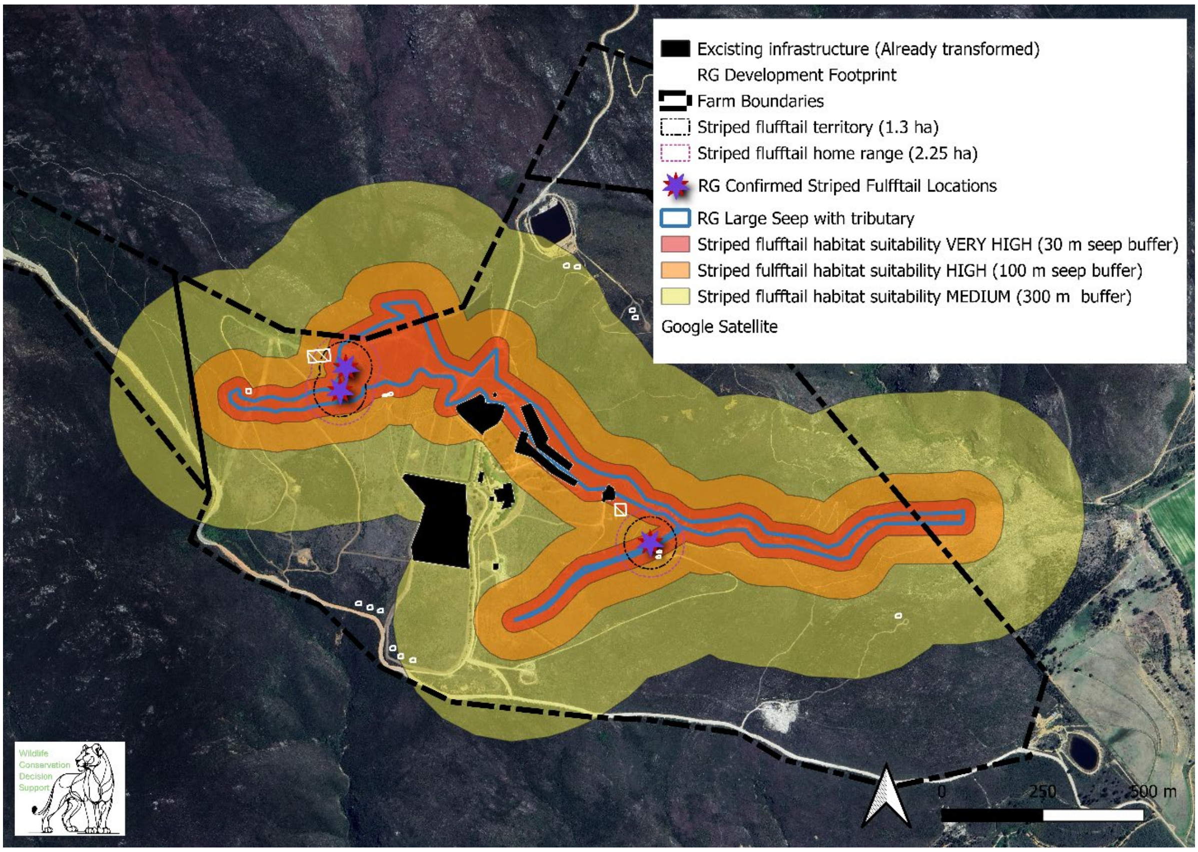

Figure 24: Estimated habitat suitability for Striped flufftail in Rusty Gate. Estimates are based on where we found them during the field survey and assumptions that the seeps would be the most important habitat feature, they are selecting at this locality.

It seems that within Rusty Gate, suitable habitats for Striped Flufftail are primarily associated with areas adjacent to drainage lines, moist depressions, and patches of dense fynbos vegetation, particularly within or near the sites where responses were recorded. These areas, although relatively limited in extent, are likely critical for shelter, breeding, and foraging.

Probability of Presence in Development Areas

Given the site-specific survey results, it is reasonable to conclude that Striped Flufftails are present and utilize habitats within portions of Rusty Gate. However, the probability of direct impact on the species will depend on the extent to which proposed development units overlap with these preferred microhabitats. Based on available information:

- ❖ Sites 3, 5, 26, and 27, where positive responses were obtained, coincide partially with development areas, although the precise alignment of infrastructure relative to sensitive habitat zones will influence risk levels.

Estimation of Breeding Pair Density

Based on estimated territory sizes provided from Taylor (1994) we can calculate striped flufftail pair density for the seep habitat +30 m buffer (see Figure 24) as:

- ❖ One breeding pair of Striped Flufftails typically uses a territory of about 1.3 hectares.
- ❖ The seep habitat +30 m buffer constitutes in total 25 hectares of suitable habitat.
- ❖ To estimate how many breeding pairs could potentially be supported:

$$\mathit{Number\ of\ pairs} = \frac{25\ ha}{1.3\ ha\ per\ pair} = 19.23$$

- ❖ Final estimate: About 19 breeding pairs could be supported in 25 hectares of suitable habitat.

Note: In real-world conditions, territories often cannot fit perfectly without some overlap or unusable gaps, especially in patchy fynbos or grassland mosaics. A practical, conservative estimate might be slightly lower — for example, assuming ~80–90% habitat packing efficiency (Table 21).

Table 21: Estimated Number of Striped Flufftail Breeding Pairs for 25 ha Suitable Habitat

Habitat Occupancy Efficiency	Estimated Number of Breeding Pairs	Notes
100% (ideal, full occupation)	19 pairs	Based on 1 pair per 1.3 ha; no gaps or barriers.
90% (high realistic efficiency)	17 pairs	Minor habitat gaps or unsuitable patches.
80% (moderate realistic efficiency)	15 pairs	Moderate habitat fragmentation or disturbance (probably the case in Rusty Gate).

Assumptions and Need for Further Survey Work

The current estimates of potential Striped Flufftail (*Sarothrura affinis*) breeding pair density at Rusty Gate are based on two key assumptions. First, it is assumed that Striped Flufftails preferentially occupy moist seepage habitats and drainage lines within the broader landscape, as indicated by our own field detections and regional habitat descriptions (Graham and Ryan 1984, Kakebeeke 1993). Unfortunately, most literature sources are vague and not empirically tested e.g. no in-depth studies exist on Striped flufftail in fynbos habitats. Second, the estimated territory size of approximately 1.3 hectares per breeding pair is derived from theoretical calculations based on body mass, as reported by Taylor (1994), rather than from direct range measurements. These assumptions introduce a degree of uncertainty into the current projections. To strengthen the ecological assessment and refine estimates of population density and habitat use, it is recommended that a dedicated species-specific survey be conducted. Recent studies (Colyn et al., 2017; Colyn et al., 2019) demonstrate that camera trapping, when carefully deployed within suitable wetland and seep habitats, can non-invasively and effectively detect flufftail presence, habitat preferences, and activity patterns. A targeted camera trap and acoustic survey at Rusty Gate, designed following these protocols, could potentially provide more robust empirical data on Striped Flufftail occupancy and spatial requirements, thereby improving the accuracy of environmental management recommendations for the site.

Site Ecological Importance (SEI) Assessment for Striped Flufftail at Rusty Gate

The SEI for Striped flufftail habitat is considered to be **'High'** (Table 22)**.**

Table 22: Evaluation of site ecological importance (SEI) in terms of impact on the habitat (the receptor) for Striped flufftail for the proposed development, see evaluation criteria (SANBI 2020). SEI is classified as 'high'.

Biodiversity importance		Conservation importance				
		Very high	High	Medium	Low	Very low
Functional integrity	Very high	Very high	Very high	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

Site ecological importance (SEI)		Biodiversity importance				
		Very high	High	Medium	Low	Very low
Receptor resilience	Very low	Very high	Very high	High	Medium	Low
	Low	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	High	Medium	Medium	Low	Low	Very low
	Very high	Medium	Low	Very low	Very low	Very low

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

Potential Importance of Rusty Gate for Black Harrier (Circus maurus) and Likelihood of Occurrence

The Black Harrier (*Circus maurus*) is a rare, Endangered, and southern African endemic raptor species, with an estimated global population of only 1,000–2,000 individuals (Curtis et al. 2004). It is almost entirely restricted to the Fynbos biome for breeding, with peripheral populations in adjacent Karoo and Grassland biomes. Over the past century, it has likely lost more than 50% of its preferred breeding habitat due to widespread agricultural transformation, urbanization, and invasion by alien plant species, especially in lowland areas of the Western Cape (Curtis et al. 2004, Taylor 2015). Black Harriers show a strong preference for intact Strandveld, Mountain Fynbos, and Renosterveld habitats for nesting. They are largely absent from heavily transformed landscapes and tend to avoid breeding in cereal croplands, although they may forage in such areas (Curtis et al. 2004). In fragmented Renosterveld landscapes, Black Harriers are mainly associated with larger, high-quality patches of natural vegetation, rather than small or degraded remnants. The species is somewhat flexible when foraging and will hunt across a variety of open habitats, including Montane Fynbos, Nama Karoo shrublands, semi-desert areas, floodplains, and cultivated lands (Curtis et al. 2004). Small mammals, such as rodents, and small birds (particularly quail species), form the bulk of its diet. During the breeding season, Black Harriers have relatively small, localized home ranges typically between 50 and 150 km², as they stay close to their nests to forage (Garcia-Heras et al. 2019). In contrast, during the non-breeding season, they become nomadic, with much larger home ranges that can exceed 1,000 km², moving widely across South Africa in response to prey availability and rainfall patterns (Garcia-Heras et al. 2019). Factors influencing home range size include prey abundance, habitat quality, and breeding stage, with ranges expanding in poorer habitats or when prey is scarce. Overall, they are strongly tied to Fynbos and coastal shrublands during breeding but range more broadly across Karoo and agricultural landscapes when not breeding.

Likelihood of Occurrence at Rusty Gate:

GBIF and iNaturalist datasets show numerous records of Black Harriers in the wider region surrounding the Rusty Gate property, indicating the species occurs within the landscape context. The habitat at Rusty Gate — assuming it retains relatively intact patches of Mountain Fynbos would be suitable for foraging and potentially nesting if habitat quality is sufficiently high. No Black Harriers were observed during the field survey conducted for this assessment; however, given the species' low population density and wide-ranging foraging behavior, this does not exclude the possibility of occasional or seasonal use of the property.

Potential Contribution of Rusty Gate as Habitat for Black Harriers

Although the Rusty Gate property is relatively small (<300 ha), it may still offer locally important habitat for the Black Harrier (Circus maurus), a rare and Endangered raptor endemic to southern Africa. Black Harriers show a preference for breeding in extensive, relatively undisturbed Fynbos or large, high-quality patches of Renosterveld and Mountain Fynbos.

Given the small size of Rusty Gate relative to these larger home range requirements, the property alone is unlikely to support a resident breeding pair unless it is part of a larger, connected landscape of suitable habitat. Nevertheless, if Rusty Gate retains intact Mountain Fynbos or good quality natural vegetation, it could contribute to foraging habitat, movement corridors, or even serve as a temporary settlement area during post-breeding or migratory movements, particularly if located near other patches of native vegetation.

Observational records (e.g., GBIF, iNaturalist) indicate that Black Harriers occur in the general region, and while no individuals were recorded during the field survey, their wide-ranging foraging behavior and low detectability rates suggest that occasional use of Rusty Gate for hunting is moderately likely. The conservation value of the property for Black Harriers is therefore assessed as supporting supplementary habitat functions, contributing to the landscape-level conservation matrix needed to sustain the species in a region where more than 50% of core breeding habitat has been lost.

Site Ecological Importance (SEI) Assessment for Black harrier at Rusty Gate

If development implemented as per current plan with consideration of mitigation measures. In this case the SEI = ‘Low’ (Table 23).

Table 23: Evaluation of site ecological importance (SEI) in terms of impact on the habitat (the receptor) for Black harrier for the proposed development, see evaluation criteria (SANBI 2020). SEI is classified as ‘low’.

Biodiversity importance		Conservation importance				
		Very high	High	Medium	Low	Very low
Functional integrity	Very high	Very high	Very high	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

Site ecological importance (SEI)		Biodiversity importance				
		Very high	High	Medium	Low	Very low
Receptor resilience	Very low	Very high	Very high	High	Medium	Low
	Low	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	High	Medium	Medium	Low	Low	Very low
	Very high	Medium	Low	Very low	Very low	Very low

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

Potential Importance of Rusty Gate for Secretary bird Sagittarius serpentarius and Likelihood of Occurrence

The Secretary bird *Sagittarius serpentarius* is classified as Vulnerable and is widely distributed throughout South Africa. The species prefers open grassland and scrubland, with the ground cover shorter than 50 cm (Boshoff and Allan 1997). The species is absent from Mountain Fynbos, forest, dense woodland and very rocky, hilly or mountainous woodland (Boshoff and Allan 1997). Because the species is not found in mountainous Fynbos areas there is a very low likelihood that the species would be present the property. The Secretary bird *Sagittarius serpentarius,* will therefore not likely be impacted by the proposed development and SEI are classified as 'very low'.

Potential Importance of Rusty Gate for Verreaux's eagle Aquila verreauxii and Likelihood of Occurrence

The Verreaux's eagle (*Aquila verreauxii*) is currently classified as Vulnerable within southern Africa and is widely distributed across suitable habitat in South Africa, particularly in areas characterized by mountainous terrain and rocky outcrops. The species predominantly preys on rock hyrax (*Procavia capensis*) but is an opportunistic predator capable of utilizing a variety of medium-sized mammals, large birds, and carrion (Murgatroyd et al. 2016b). Records from the iNaturalist and Global Biodiversity Information Facility (GBIF) databases indicate regular observations of the species in the broader region surrounding Rusty Gate. During the site assessment, a Verreaux's eagle was recorded at Site 4, suggesting active use of the property, likely for foraging purposes.

The layout of the proposed development areas, comprising multiple small and spatially separated footprints, maintains landscape connectivity and limits potential disturbance to wide-ranging, non-sedentary species such as the Verreaux's eagle. The development is not located near prominent cliff features typically associated with nesting, nor is it expected to significantly reduce the availability of prey species.

GPS telemetry studies indicate that Verreaux's eagles maintain relatively small core ranges (approximately 1.4 km²) during key periods, with larger home ranges extending up to 28 km² during foraging activities (Murgatroyd et al. 2016a). Although the Rusty Gate property (~300 ha) represents a small portion of this range, it may contribute to broader foraging opportunities for the species. Research further suggests that Verreaux's eagles can persist in landscapes subject to moderate levels of transformation, provided sufficient prey resources and undisturbed roosting or nesting sites remain (Murgatroyd et al. 2016a, Murgatroyd et al. 2016b).

Based on available data and site observations, Rusty Gate is considered to have a moderate importance as supplementary foraging habitat for Verreaux's eagles. The likelihood of occurrence of the species on the property is assessed as high. Given the design of the proposed development and the nature of the surrounding landscape, the potential impact on Verreaux's eagle habitat is considered low (Table 24).

Table 24: Evaluation of site ecological importance (SEI) in terms of impact on the habitat (the receptor) for Verreaux's eagles for the proposed development, see evaluation criteria (SANBI 2020). SEI is classified as 'low'.

Biodiversity importance		Conservation importance				
		Very high	High	Medium	Low	Very low
Functional integrity	Very high	Very high	Very high	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

Site ecological importance (SEI)		Biodiversity importance				
		Very high	High	Medium	Low	Very low
Receptor resilience	Very low	Very high	Very high	High	Medium	Low
	Low	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	High	Medium	Medium	Low	Low	Very low
	Very high	Medium	Low	Very low	Very low	Very low

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

Potential Importance of Rusty Gate for Landdroskop Mountain Toadlet Capensibufo magistratus and Likelihood of Occurrence

The Landdroskop Mountain Toadlet (*Capensibufo magistratus*) is currently listed as Data Deficient under the IUCN Red List of Threatened Species (Channing et al. 2017). This species is endemic to the Western Cape and is known from a limited number of locations, including Landdroskop in the Hottentots-Holland Mountains, Groenlandberg Mountain, Limietberg within the Hawekwas Mountains, and Jonaskop in the Riviersonderend Mountains. Capensibufo magistratus typically inhabits shallow, temporary pools with emergent sedge-like vegetation within Mountain Fynbos or Grassy Fynbos vegetation types. Records from iNaturalist indicate the nearest confirmed observations approximately 40 km east of the Rusty Gate property, while GBIF records similarly reflect occurrences about 35–40 km from the site.

During the site assessment at Rusty Gate, neither the species nor suitable breeding habitat (such as shallow seasonal pools with sedge-like vegetation) was observed. However, it is noted that *Capensibufo magistratus* is difficult to detect outside of its breeding season, and cryptic populations may remain undetected during general faunal surveys. Consequently, the potential presence of the species within the project area cannot be entirely excluded. The scattered nature and relatively small footprint of the proposed development sites allow for high levels of landscape connectivity and minimal disturbance to indigenous vegetation and natural hydrological features, which would mitigate potential impacts should the species occur.

Based on currently available information, the likelihood of significant negative impact on *Capensibufo magistratus* populations at Rusty Gate is considered to be low. The confidence level in this assessment is moderate, owing to the lack of direct observations during the survey and the species' known low detectability. To improve confidence in the assessment, it is recommended that targeted amphibian surveys be conducted during the breeding season, typically late winter to early spring following adequate rainfall, focusing particularly on any temporary pools and moist depressions. Furthermore, environmental management measures that protect any seasonal wetlands and shallow depressions during construction and operation are advisable, even in the absence of confirmed populations. The Landdroskop

Mountain Toadlet *Capensibufo magistratus*, will therefore not likely be impacted by the proposed development and SEI are classified as 'low' (Table 25).

Table 25: Evaluation of site ecological importance (SEI) in terms of impact on the habitat (the receptor) for Landdroskop Mountain Toadlet for the proposed development, see evaluation criteria (SANBI 2020). SEI is classified as 'low'.

Biodiversity importance		Conservation importance				
		Very high	High	Medium	Low	Very low
Functional integrity	Very high	Very high	Very high	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

Site ecological importance (SEI)		Biodiversity importance				
		Very high	High	Medium	Low	Very low
Receptor resilience	Very low	Very high	Very high	High	Medium	Low
	Low	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	High	Medium	Medium	Low	Low	Very low
	Very high	Medium	Low	Very low	Very low	Very low

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

Potential Importance of Rusty Gate for Riviersonderend moss frog Arthroleptella atermina and Likelihood of Occurrence

The Riviersonderend Moss Frog (*Arthroleptella atermina*) is a recently described species whose conservation status remains formally unassessed but is likely to be of concern given its highly restricted distribution. The species is endemic to the Riviersonderend Mountains, occurring from Die Galg eastwards, with its westernmost known population near Jonaskop (Turner and Channing 2017). *Arthroleptella atermina* is typically associated with thickly vegetated seeps dominated by restioid plants on gentle to moderate mountain slopes within montane fynbos vegetation. Such habitat is present within the Rusty Gate Mountain Retreat property (Steytler 2024), suggesting the potential for suitable environmental conditions. Records from iNaturalist and GBIF databases confirm the presence of the species within the broader region, with the nearest confirmed observations approximately 6 km to the east of Rusty Gate. No individuals of *A. atermina* were observed during the site assessment. However, the species is extremely cryptic and unlikely to be detected outside of its breeding season, which typically occurs during the winter months following sufficient rainfall, usually between June and September. Consequently, the potential presence of *A. atermina* at Rusty Gate cannot be conclusively ruled out. The scattered nature and small footprints of the proposed development sites retain high levels of landscape connectivity and cause limited disturbance to seepage wetlands and associated fynbos habitats, thus reducing potential impacts on any undetected populations. Based on currently available information, the likelihood of *A. atermina* occurring within the property is assessed as low to moderate. The confidence level in this assessment is moderate, due to the absence of direct observations and the inherent detectability challenges of the species. To improve confidence, it is recommended that targeted acoustic surveys for calling males be undertaken during the winter breeding season, particularly after adequate rainfall, focusing on areas of thick, restio-dominated seepage vegetation. Precautionary measures to protect seeps and seasonal wetlands during construction activities are also recommended, even in the absence of confirmed detections. The Riviersonderend moss frog *Arthroleptella atermina*, will therefore not likely be impacted by the proposed development and SEI are classified as 'low' (Table 26).

Table 26: Evaluation of site ecological importance (SEI) in terms of impact on the habitat (the receptor) for Riviersonderend moss frog for the proposed development, see evaluation criteria (SANBI 2020). SEI is classified as 'low'.

Biodiversity importance		Conservation importance				
		Very high	High	Medium	Low	Very low
Functional integrity	Very high	Very high	Very high	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

Site ecological importance (SEI)		Biodiversity importance				
		Very high	High	Medium	Low	Very low
Receptor resilience	Very low	Very high	Very high	High	Medium	Low
	Low	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	High	Medium	Medium	Low	Low	Very low
	Very high	Medium	Low	Very low	Very low	Very low

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

Potential Importance of Rusty Gate for Peringueyi's Meadow Katydid Conocephalus peringueyi and Likelihood of Occurrence

Peringueyi's Meadow Katydid (*Conocephalus peringueyi*) is an endemic species of katydid that occurs at high elevations within the southwestern Cape mountains. The species is listed as Vulnerable (criteria B1, B2) on the IUCN Red List (Bazelet and Naskrecki 2014). C. peringueyi has been confirmed from only six locations, including Table Mountain National Park, the Hawequa Mountains, and the Kogelberg Mountains, although it is anticipated that it may occur more widely across high-elevation fynbos habitats in the Western Cape. Despite this broader potential range, the species is believed to be in decline due to ongoing habitat loss. The estimated area of occupancy for *C. peringueyi* is approximately 32 km², with an extent of occurrence of about 5,065 km² (Bazelet and Naskrecki 2014). No confirmed host plant data are currently available for the species. Individuals are nocturnal and are therefore particularly sensitive to light pollution, including artificial lighting associated with development activities. No specimens of *C. peringueyi* were observed or detected acoustically during the site assessment at Rusty Gate. At Site 28, a 'low-moderate' potential impact rating was assigned for *C. peringueyi* based on the presence of a closely related species, *Conocephalus* (formerly *Megalotheca*) sp., sampled near the proposed development area. Although specific elevational preferences and host plant associations for *C. peringueyi* remain unknown, the presence of two prominent restio species, *Hypodiscus aristatus* and *Thamnochortus lucens*, may suggest suitable habitat characteristics. Restios are considered potential host plants for some species within *Conocephalus* (subgenus *Megalotheca*), and this may also apply to *C. peringueyi*. All other proposed development sites were assessed as having a 'low' potential impact on *C. peringueyi*, owing to one or more of the following factors: a low level of intact natural vegetation at the site, the small spatial footprint of the proposed developments which would allow for species movement through the landscape, and the continued availability of extensive areas of intact, suitable vegetation outside the development footprints. Based on available data, the likelihood of *C. peringueyi* occurring on the property is assessed as low to moderate at Site 28 and low elsewhere. The confidence level of this assessment is moderate to low, given the absence of direct records and the limited ecological information available for this species. It is recommended that precautionary measures to minimize artificial lighting be incorporated into site design and construction phases, particularly at Site 28, to mitigate any potential impacts on *C. peringueyi* and other nocturnal arthropod species. *C. peringueyi*, will therefore not likely be impacted by the proposed development and SEI are classified as 'low' (Table 27).

Table 27: Evaluation of site ecological importance (SEI) in terms of impact on the habitat (the receptor) for Peringueyi's Meadow Katydid for the proposed development, see evaluation criteria (SANBI 2020). SEI is classified as 'low'.

Biodiversity importance		Conservation importance				
		Very high	High	Medium	Low	Very low
Functional integrity	Very high	Very high	Very high	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

Site ecological importance (SEI)		Biodiversity importance				
		Very high	High	Medium	Low	Very low
Receptor resilience	Very low	Very high	Very high	High	Medium	Low
	Low	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	High	Medium	Medium	Low	Low	Very low
	Very high	Medium	Low	Very low	Very low	Very low

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

Potential Importance of Rusty Gate for Mute Winter Katydid Brinckiella aptera and Likelihood of Occurrence

The Mute Winter Katydid (*Brinckiella aptera*) is an endemic, flightless katydid species that occurs within the Succulent Karoo and Fynbos biomes of the Western Cape. The species is listed as Vulnerable under the IUCN Red List (criterion B1) due to its limited distribution and threats from habitat loss (Naskrecki & Bazelet, 2009). B. aptera has been recorded from only four localities, including Bredasdorp, Pearly Beach, and Tulbagh, although it is expected to occur more widely across suitable Succulent Karoo and Fynbos habitats in the Western Cape, potentially extending into southern Namaqualand. Host plant data for the species are lacking, but it is assumed that B. aptera feeds on flowers and leaves of a narrow range of low-growing, herbaceous shrubs. The estimated extent of occurrence is approximately 12,500 km² (Naskrecki & Bazelet, 2009). The species is nocturnal and thus sensitive to artificial lighting associated with development activities, although individuals may also be observed basking in the sun during daylight hours. Their peak period of emergence typically occurs between August and October. No specimens of B. aptera were recorded during the site visit to the Rusty Gate property. Based on current information, the proposed developments are classified as posing a 'low' potential impact on B. aptera. This assessment is supported by several factors, including the absence of any historical species records from the study area, the lack of host plant information linking the current vegetation to the species' specific ecological requirements, the absence of direct observations during the site visit, the small footprint of the proposed developments relative to the extent of surrounding natural vegetation, and the availability of large areas of intact vegetation that will remain unaffected, allowing for species movement and persistence in the landscape. The likelihood of B. aptera occurring within the proposed development sites is considered low, and the confidence level in this assessment is moderate due to the limited ecological information available. To mitigate any potential impacts on nocturnal arthropods, it is recommended that the use of artificial lighting be minimized during construction and operational phases, particularly by applying downward-directed, shielded lights and limiting nighttime illumination where feasible. *Brinckiella aptera*, will likely be impacted by the proposed development and SEI are classified as 'low' (Table 28).

Table 28: Evaluation of site ecological importance (SEI) in terms of impact on the habitat (the receptor) for Mute Winter Katydid for the proposed development, see evaluation criteria (SANBI 2020). SEI is classified as 'low'.

Biodiversity importance		Conservation importance				
		Very high	High	Medium	Low	Very low
Functional integrity	Very high	Very high	Very high	High	Medium	Low
	High	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	Low	Medium	Medium	Low	Low	Very low
	Very low	Medium	Low	Very low	Very low	Very low

Site ecological importance (SEI)		Biodiversity importance				
		Very high	High	Medium	Low	Very low
Receptor resilience	Very low	Very high	Very high	High	Medium	Low
	Low	Very high	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very low
	High	Medium	Medium	Low	Low	Very low
	Very high	Medium	Low	Very low	Very low	Very low

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

Potential Importance of Rusty Gate for Yellow-winged Agile Grasshopper Aneuryphymus montanus and Likelihood of Occurrence

The Yellow-winged Agile Grasshopper (*Aneuryphymus montanus*) is an endemic species that occurs across mountain ranges in the Western and Eastern Cape provinces. It is listed as Vulnerable (criterion B2) on the IUCN Red List due to threats associated with habitat alteration and fragmentation. *A. montanus* has been recorded from several localities, including near Clanwilliam, Graafwater, Lambert's Bay, De Rust, Suurbraak, Bot River, the Kogelberg, and Joubertinia, indicating an association with a range of fynbos vegetation types on south-facing, cooler slopes (Brown 1960, Kinvig 2005). Historical records also suggest that the species may occur in rocky foothills and partly burnt stands of evergreen sclerophyll vegetation (Brown, 1960). The estimated extent of occurrence for *A. montanus* is approximately 170,000 km^2, representing the largest range among the insect species of conservation concern assessed for this study. No specimens of *A. montanus* were observed during the field assessment at Rusty Gate. The proposed developments are assessed as posing a 'low' potential impact on *A. montanus* based on several factors, including the absence of historical or recent records from the immediate area, the lack of host plant records to link current vegetation to the species' known habitat preferences, the absence of direct observations during site visits, the relatively small spatial footprint of the proposed developments, the large extent of intact surrounding fynbos vegetation that will remain unaffected and capable of supporting species movement, and the species' broad regional distribution. The likelihood of *A. montanus* occurring within the development sites is considered very low, and the confidence level in this assessment is moderate due to limited site-specific data. No specific mitigation measures are deemed necessary beyond standard best practices to minimize unnecessary habitat disturbance, although general protection of intact natural vegetation adjacent to the development sites would support the conservation of regional insect biodiversity, including potentially undetected populations of *A. montanus*.

Overall SEI for the PAOI

The overall SEI for the PAOI is considered '**High'** (Table 29):

Table 29: Evaluation of SEI of faunal habitats/processes in the PAOI for the proposed development. BI = biodiversity importance, RR = receptor resilience.

Habitat/Process	Conservation Importance	Functional Integrity	Receptor resilience	Site ecological importance
Large mammal Landscape Connectivity (suitable safe habitat allowing free animal movement)	**Medium** Area is not a core habitat but contributes to regional movement pathways for large mammals.	**High** Landscape is mostly natural with intact corridors and low fencing intensity	**High** Mammals are mobile and adaptable to moderate disturbance.	**Low BI=Medium RR=High**
Large mammal behavioural Impacts	**Medium** Area is not a core habitat but contributes to regional movement pathways for large mammals.	**High** Landscape is mostly natural with intact corridors and low tourism intensity	**High** Mammals are mobile and adaptable to moderate disturbance.	**Low BI=Medium RR=High**
Striped Flufftail *Sarothrura affinis*	**High** Likely presence based on habitat and partial detections; species is regionally rare (VU).	**High** Habitat persists but will be impacted.	**Low** Sensitive species with poor recolonization and breeding in disturbed conditions.	**High BI=High RR=Low**
Black harrier *Circus maurus* forage habitat	**High** EN-listed species with recent	**High** Mostly intact fynbos with low	**Very high** Wide-ranging and able to shift	**Low BI=High RR=Very high**

	sightings and use of area for foraging.	disturbance and suitable structure.	foraging zones in response to habitat change.	
Secretary bird *Sagittarius serpentarius* (species not present)	**Very low**	**Very low**	**Very low**	**Very low**
Verreaux's eagle *Aquila verreauxii*	**High** VU-listed and confirmed presence for foraging; species of national conservation concern.	**High** Open slopes support prey, but no cliffs for nesting reduces integrity slightly.	**Very high** Highly mobile, large foraging range; not tied to local nesting.	**Low** **BI=High** **RR=Very high**
Landdroskop Mountain Toadlet *Capensibufo magistratus*	**Low** DD status with no confirmed detection; potential presence inferred from proximity to reserve.	**High** Suitable microhabitats exist, particularly temporary pools and seep zones.	**High** Species presumed to persist if microhabitats remain undisturbed.	**Low** **BI=Medium** **RR=High**
Riviersonderend moss frog *Arthroleptella atermina*	**Low** Likely regional presence; site contains some seepage habitat, but detection absent	**High** Seepage areas intact and undisturbed.	**High** Species presumed to persist if microhabitats remain undisturbed.	**Low** **BI=Medium** **RR=High**
Peringueyi's Meadow Katydid *Conocephalus peringueyi*	**Low** VU but no direct detection; known only from scattered localities.	**High** Microhabitats are intact and minimally disturbed.	**High** Likely persistent in patchy habitats if host plants and light regimes remain.	**Low** **BI=Medium** **RR=High**
Mute Winter Katydid *Brinckiella aptera*	**Low** VU with unknown host plant specificity; suitable broad habitat.	**High** Natural vegetation persists with minimal fragmentation.	**High** Likely persistent in patchy habitats if host plants and light regimes remain.	**Low** BI=Medium RR=High
Yellow-winged Agile Grasshopper *Aneuryphymus montanus*	**Very low**	**Very low**	**Very low**	**Very low**

Recommended mitigation

The following mitigation measures are recommended. We have organised this section to address specific types faunal populations and impacts

Reducing potential landscape connectivity and large mammal behavioural impacts

The following table outlines recommended mitigation measures to manage potential impacts on landscape connectivity and large mammal behavioural patterns during all phases of the project.

Table 30: Recommended mitigation measures dealing with large mammal landscape connectivity and behavioural impacts

Impact Category	Project Phase	Mitigation Measure	Objective
Landscape Connectivity	Pre-construction	Locate infrastructure outside CBA1 and ESA1 zones wherever feasible.	Minimize direct habitat loss in critical connectivity zones.
	Pre-construction	Designate and map natural movement corridors prior to finalizing development layout.	Ensure corridors are preserved in planning.
	Construction	Maintain broad undeveloped buffer zones around natural corridors.	Retain functional landscape linkages during construction.
	Construction	Minimize construction footprint and avoid unnecessary vegetation clearance.	Reduce habitat fragmentation.
	Post-construction	Restore temporary construction areas with indigenous vegetation.	Rehabilitate affected habitats and corridor function.
	Post-construction	Incorporate wildlife-friendly fencing designs where fencing is required. Avoid fencing as far as possible	Facilitate safe animal movement across the site.
Animal Behavioural Responses	Pre-construction	Schedule high-disturbance activities (e.g., bulk earthworks) outside of sensitive wildlife periods (e.g., breeding seasons).	Reduce stress on sensitive species before activity begins.
	Construction	Limit noisy or disruptive activities to daylight hours only.	Minimize disturbance to crepuscular and nocturnal species.
	Construction	Establish clear, enforced no-go zones for construction crews within or adjacent to key habitat corridors.	Prevent unintended disturbances near sensitive areas.
	Post-construction	Implement visitor education programs promoting low-impact recreation practices.	Reduce cumulative behavioral disturbance from tourism.
	Post-construction	Monitor large mammal activity patterns (e.g., camera trapping) to detect shifts in behavior or corridor use.	Inform adaptive management to address emerging impacts.
	Post-construction	Manage tourist flows spatially and temporally (e.g., restrict access during dawn/dusk in sensitive areas).	Minimize disturbance during critical wildlife activity periods.

Mitigation specific to Striped Flufftail.

The following table outlines recommended mitigation measures to manage potential impacts on Striped flufftail.

Table 31: Recommended mitigation measures dealing with potential impacts on Striped flufftail

Impact Category	Project Phase	Mitigation Measure	Objective
Habitat Loss	Planning & Design	Avoid development in seepage zones and dense fynbos patches known to support Striped Flufftail. Move development sites out of 30 m buffer zone (Sites 2, 3, 5, 26 and 27)	Preserve core breeding and foraging habitat.
Habitat Fragmentation	Planning & Construction	Maintain ecological corridors and a minimum 30 m buffer zone around sensitive wetland microhabitats.	Ensure landscape connectivity and reduce isolation of suitable habitat patches.
Disturbance from Construction Noise	Construction	Restrict construction near sensitive habitat to the non-breeding season (November-April); limit construction to daylight hours.	Minimize interference with calling, nesting, and foraging activity.
Fire Regime Disruption	Operation & Maintenance	Implement a rotational fire management plan preserving unburned refugia; avoid hot burns in seepage zones.	Sustain habitat structure needed for cover and breeding.
Erosion and Runoff	Construction	Use sediment traps, contour berms, and redirect runoff away from seepage zones during site preparation and construction.	Protect microhabitat quality and prevent siltation of breeding wetlands.
Artificial Lighting	Operation	Install low-intensity, downward-shielded lights and avoid lighting near wetland and dense fynbos zones.	Reduce nocturnal disturbance and preserve natural activity cycles.
Recreational Disturbance from Birdwatchers	Operation	Prohibit the use of playback (acoustic luring) within designated sensitive zones through signage and visitor briefings.	Prevent acoustic stress and disruption to natural calling, breeding, and territory establishment.
Long-Term Monitoring	Operation	Conduct periodic acoustic and camera trap surveys to confirm presence and assess population trends post-construction.	Evaluate effectiveness of mitigation and allow adaptive management.

Mitigation specific to amphibians

The following table outlines recommended mitigation measures to manage potential impacts on amphibians.

Table 32: Recommended mitigation measures dealing with potential impacts on amphibians

Impact Category	Project Phase	Mitigation Measure	Objective
Habitat Destruction (Seepage Zones)	Planning & Design	Exclude infrastructure from wetland areas and natural drainage lines; buffer of at least 30 m maintained around any seepage areas.	Protect critical breeding and foraging microhabitats.
Breeding Habitat Degradation	Construction	Avoid any earthworks or vegetation clearance in potential amphibian habitats during the breeding season (late winter to spring).	Prevent loss of egg-laying and tadpole development areas.

Impact Category	Project Phase	Mitigation Measure	Objective
Water Quality Impacts	Construction	Prevent chemical and sediment runoff into aquatic habitats by installing erosion controls and avoiding use of herbicides nearby.	Maintain water quality essential for larval development.
Artificial Lighting	Operation	Minimize night lighting near wet zones with motion sensors or full shielding.	Prevent disorientation and alteration of amphibian activity cycles.
Disturbance from Recreation	Operation	Prevent foot traffic, picnicking, or construction of trails through sensitive seepage habitats.	Reduce habitat trampling and stress to frog populations.
Fire Regime Alteration	Operation & Maintenance	Maintain natural fire cycles at appropriate intervals, avoiding hot fires in known wetland/seep areas.	Sustain post-burn recovery of wetland vegetation and invertebrate prey.
Population Monitoring	Operation	Implement seasonal call surveys post-development to detect persistence or declines.	Assess success of mitigation and adjust practices if necessary.

Mitigation specific to insects

The following table outlines recommended mitigation measures to manage potential impacts on insects.

Table 33: Recommended mitigation measures dealing with potential impacts on insects

Impact Category	Project Phase	Mitigation Measure	Objective
Microhabitat Disturbance	Planning & Construction	Avoid fynbos clearing in known or likely habitat patches (south-facing slopes, grassy mosaics, restio-dominated areas).	Conserve host plants and breeding sites.
Artificial Light Pollution	Operation	Use amber-spectrum or motion-controlled lighting; eliminate unnecessary lights in nocturnal insect habitats.	Reduce disorientation and mortality from light attraction.
Host Plant Loss	Construction	Identify and preserve endemic/restioid host plants during vegetation surveys prior to clearing.	Protect essential larval resources.
Fire Management	Operation & Maintenance	Implement a patch-mosaic burning regime that allows refugia to remain during fire events.	Support insect recolonization and maintain habitat heterogeneity.
Post-development Monitoring	Operation	Conduct seasonal sweep-net surveys and visual assessments to track persistence of species populations.	Verify mitigation effectiveness and inform adaptive management.

Predicted Faunal Impacts Under Alternative Development Scenarios

This section presents a comparative evaluation of potential faunal impacts associated with the proposed development at Rusty Gate Mountain Retreat under three scenarios: (1) development without mitigation Table 34), (2) development with implementation of proposed mitigation measures (Table 35), and (3) no development (Table 36). The assessment is based on species-specific sensitivities, ecological processes (e.g., connectivity, foraging, and breeding), and the likelihood of occurrence of species of conservation concern identified during field surveys and desktop analyses. For each scenario, impacts are categorised by project phase, duration, spatial extent, probability of occurrence, and overall significance. The tables provide a structured synthesis of the risks to key faunal receptors, including the Striped Flufftail (*Sarothrura affinis*), endemic amphibians, invertebrates such as katydids and grasshoppers, and large mammals reliant on intact fynbos corridors. This analysis supports decision-making by highlighting the relative ecological trade-offs associated with each development alternative.

Table 34: Faunal Environmental Impact Summary – Scenario 1: Development Without Mitigation

Impact	Project Phase	Nature of Impact	Impact Duration	Extent	Probability	Significance
Loss of habitat for Striped Flufftail (VU)	Construction/Operation	Clearing of moist fynbos and seep zones	Long-term	Site-specific	High	High
Fragmentation of Striped Flufftail habitat	Construction/Operation	Interruption of continuous microhabitats	Long-term	Local	High	High
Disturbance from noise and recreation	Construction/Operation	Unregulated construction and tourist presence	Short-term (episodic)	Site-specific	Medium	Medium
Altered fire regime affecting flufftail habitat	Operation	Lack of ecological fire planning	Long-term	Local	Medium	Medium
Artificial lighting impacts on nocturnal fauna	Operation	No shielding of lights; full site exposure	Long-term	Site-wide	High	High
Habitat degradation for endemic amphibians	Construction	Trampling and sedimentation of seeps	Short-term	Site-specific	Medium	Medium
Loss of amphibian breeding habitats	Construction	Vegetation clearance near breeding sites	Short-term	Local	Medium	Medium
Behavioural disturbance to large mammals	Operation	Displacement by increased human activity	Long-term	Local to regional	Medium	Medium
Loss of ecological corridors	All phases	Linear infrastructure breaks movement routes	Long-term	Regional	Low	Low
Loss of microhabitat for SCC invertebrates	Construction	Destruction of vegetation and refuge plants	Short-term	Site-specific	Medium	Medium
Disturbance from acoustic playback by birders	Operation	Unregulated call-playback near sensitive species	Short-term	Site-specific	Medium	Medium
Disturbance of foraging raptors	Operation	Visual and acoustic disturbance from new buildings	Medium-term	Local	Medium	Medium
Cumulative loss of undisturbed mountain fynbos	All phases	Transformation of intact patches	Long-term	Local to regional	High	High
Potential impact on undocumented invertebrates	Construction	Destruction of unknown microhabitats	Long-term	Site-specific	Medium	Medium

Table 35: Faunal Environmental Impact Summary – Scenario 2: Development with Mitigation

Impact	Project Phase	Nature of Impact	Impact Duration	Extent	Probability	Significance
Loss of habitat for Striped Flufftail (VU)	Construction/Operation	Partial edge disturbance; core areas buffered	Long-term	Site-specific	Low	Low
Fragmentation of Striped Flufftail habitat	Construction/Operation	Narrow infrastructure with buffers maintained	Long-term	Local	Low	Low
Disturbance from noise and recreation	Construction/Operation	Managed access and quiet zones	Short-term (episodic)	Site-specific	Medium	Low-Medium
Altered fire regime affecting flufftail habitat	Operation	Prescribed burns implemented	Long-term	Local	Low	Low
Artificial lighting impacts on nocturnal fauna	Operation	Downward-shielded, limited lighting zones	Long-term	Site-specific	Medium	Low
Habitat degradation for endemic amphibians	Construction	Buffers to seep zones retained	Short-term	Site-specific	Low	Low
Loss of amphibian breeding habitats	Construction	Timing avoids breeding season	Short-term	Site-specific	Low	Low
Behavioural disturbance to large mammals	Operation	Wildlife corridors retained; tourism zoned	Medium-term	Local	Medium	Low
Loss of ecological corridors	All phases	Infrastructure avoids key corridors	Long-term	Local	Low	Low
Loss of microhabitat for SCC invertebrates	Construction	Vegetation clearing limited and surveyed	Short-term	Site-specific	Medium	Low-Medium
Disturbance from acoustic playback by birders	Operation	Controlled access and signage	Short-term	Site-specific	Low	Low
Disturbance of foraging raptors	Operation	Visual buffers and minimal cliff disturbance	Medium-term	Local	Low	Low
Cumulative loss of undisturbed mountain fynbos	All phases	Minimal encroachment into intact habitat	Long-term	Local	Medium	Low
Potential impact on undocumented invertebrates	Construction	Microhabitats protected where known	Short-term	Site-specific	Medium	Low

Table 36: Faunal Environmental Impact Summary – Scenario 3: No Development

Impact	Project Phase	Nature of Impact	Impact Duration	Extent	Probability	Significance
Loss of habitat for Striped Flufftail (VU)	Ongoing operation	Minor edge disturbance from trails and footpaths	Long-term	Local (moist seeps)	Medium	Low
Fragmentation of Striped Flufftail habitat	Ongoing operation	Informal paths limit habitat continuity in some seep zones	Long-term	Site-specific	Medium	Low
Disturbance from noise and recreation	Ongoing operation	Intermittent human activity near key faunal areas	Short-term (episodic)	Site-specific	Medium	Low
Altered fire regime affecting flufftail habitat	Site maintenance	Fire breaks and accidental burns may be mistimed	Long-term	Local	Medium	Low
Artificial lighting impacts on nocturnal fauna	Ongoing operation	Current lights may already affect katydids and frogs	Long-term	Localised around buildings	Medium	Low
Habitat degradation for endemic amphibians	Ongoing operation	Footpath erosion near seepages	Long-term	Site-specific	Medium	Low
Loss of amphibian breeding habitats	Ongoing operation	Some trampling near wet depressions	Seasonal	Site-specific	Low	Low
Behavioural disturbance to large mammals	Ongoing operation	Human presence may alter activity times/routes	Ongoing	Local	Medium	Low
Loss of ecological corridors	Legacy effect	Infrastructure already restricts small-scale movement	Long-term	Local	Low	Low
Loss of microhabitat for SCC invertebrates	Ongoing operation	Trampling and mowing of Fynbos edges	Long-term	Localised	Medium	Low
Disturbance from acoustic playback by birders	Ongoing recreation	Some birders may use call playbacks for Striped Flufftail	Episodic	Site-specific	Medium	Low
Disturbance of foraging raptors	Ongoing recreation	Intermittent activity near open ridges	Seasonal	Local	Low	Low
Cumulative loss of undisturbed mountain fynbos	Ongoing use	Minor but accumulating degradation from tourism	Long-term	Local	Medium	Low
Potential impact on undocumented invertebrates	Ongoing operation	Microhabitats vulnerable to informal use	Long-term	Site-specific	Medium	Low

Dealing with potential damage-causing animals around tourism infrastructure

Wildlife interactions with tourist infrastructure are common in natural or semi-natural areas. While these encounters can enhance visitor experiences, they may also result in property damage, safety concerns, habituation, and conflicts. This guide provides practical, ethical, and ecologically sensitive approaches to managing problem species commonly encountered around tourist facilities: baboons (Papio ursinus), honey badgers (Mellivora capensis), rock hyraxes (Procavia capensis), and various rodent species.

General Principles

- Prevent rather than react: Focus on eliminating attractants and modifying environments to deter problem animals before conflict arises.
- Do no harm: All actions must comply with biodiversity and animal welfare legislation (e.g., NEMBA, Animal Protection Act).
- Avoid habituation: Animals that associate humans with food are more likely to become problematic.
- Integrated approach: Combine infrastructure design, staff training, visitor awareness, and non-lethal deterrents.

Species-Specific Management

Baboon (*Papio ursinus*)

Problems: Raiding of bins and kitchens, breaking into buildings, aggression toward tourists if food-rewarded.

Management Measures:

Waste control:
Use baboon-proof bins with locking lids.
Remove all food waste promptly from communal areas.
Building design:
Secure all doors and windows with latches or baboon-proof locks.
Install mesh screens on windows and vents.
Visitor behaviour:
Strictly prohibit feeding of baboons.
Display educational signage about risks and fines.
Active deterrents:
Employ trained baboon monitors to haze raiding individuals using slingshots, paintball markers (non-injurious), or whistles.
Use motion-sensor alarms near kitchens and waste storage areas.
Landscape design:
Avoid planting fruit-bearing trees near facilities.
Remove access structures (e.g., low balconies, exposed pipes) that baboons can climb.

Honey Badger (*Mellivora capensis*)

Problems: Ripping open refuse bins, raiding chicken coops, digging under foundations or storage units.

Management Measures:

Refuse security:

Use steel-lined, lockable bins.

Elevate bins at least 1.2 m off the ground on sturdy platforms with no accessible footholds.

Food access control:

Store all food in sealed containers in locked rooms or cupboards.

Structural deterrents:

Install anti-digging skirts (e.g., mesh buried 30 cm deep) around buildings.

Use motion-activated lights in affected zones.

Conflict response:

Never attempt to trap or relocate without provincial conservation authority approval.

Rock Hyrax (*Procavia capensis*)

Problems: Urinating/defecating in roof spaces and on ledges, damaging insulation, noise disturbance.

Management Measures:

Building exclusion:

Seal entry points into roofs and foundations with wire mesh.

Use angled metal sheeting to prevent climbing up walls or pillars.

Habitat management:

Avoid creating rock piles or retaining walls with crevices close to buildings.

Population monitoring:

If populations are excessive, consult conservation authorities for approved fertility control or habitat modification strategies.

Rodents

Problems: Food contamination, chewing of electrical wiring, nesting in roofs and walls.

Management Measures:

Sanitation and food control:

Store all food and waste in sealed, rodent-proof containers.

Regularly clean food preparation and consumption areas.

Building maintenance:

Seal cracks, pipes, and gaps larger than 5 mm.

Install bristle or rubber door sweeps on external doors.

Trapping:

Use enclosed snap traps placed along walls and behind objects.

Rodenticides:

Avoid at all costs.

Biological control:

Encourage owl presence with nesting boxes (if ecologically suitable).

Long-term prevention:

Design infrastructure with non-chewable materials (e.g., galvanized conduit for cables).

Staff and Visitor Awareness

- Conduct training workshops for staff on animal-proofing practices.
- Display visitor codes of conduct (e.g., don't feed wildlife, store food properly).
- Offer interpretive signage to foster coexistence and ecological understanding.

Legal and Ethical Considerations

All interventions must comply with:

- National Environmental Management: Biodiversity Act (NEMBA)
- Provincial conservation ordinances
- Animal Protection Act

Obtain relevant permits before using any form of capture, relocation, or lethal control.
Prioritize non-lethal and ecologically appropriate solutions.

Monitoring and Adaptive Management

- Keep incident logs to monitor problem hotspots.
- Review and update mitigation strategies seasonally or as conditions change.
- Collaborate with local conservation agencies for species-specific support.

Conclusion

The proposed expansion of tourism infrastructure at Rusty Gate Mountain Retreat presents a moderate ecological risk that can be effectively managed through the implementation of targeted mitigation measures. The site contains ecologically important features, including habitat suitable for the Vulnerable Striped Flufftail and other SCC, but the development footprint largely avoids critical biodiversity areas and maintains landscape connectivity. The mitigated development scenario offers a feasible balance between conservation priorities and tourism objectives. However, this balance is contingent upon strict adherence to proposed mitigation measures, especially those concerning habitat buffering, fire management, lighting, and visitor behaviour. Continued ecological monitoring and adaptive management are essential to ensure that impacts remain within acceptable limits and that Rusty Gate continues to contribute to regional biodiversity conservation objectives within the Cape Floristic Region.

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Appendix 1

CV and SACNASP Certificate of Prof JA Venter

CV and SACNASP Certificate of Dr Rudi Swart

Curriculum Vitae

Jan Adriaan Venter

1. Personal information

Full name:	Jan Adriaan Venter	Home address:	8 Steve Landman Crescent, Loeriepark, George, 6529, South Africa
Age:	52		
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Web page: Wildlife Ecology Lab			
Scopus Scopus	Google Scholar Google		

2. Tertiary qualifications

Degree	Institution	Research theme or modules	Time period
Doctor of Philosophy: Biology	University of Kwazulu-Natal	Intrinsic and extrinsic influences on African large herbivore assemblages and implications for their conservation.	2009 – 2014
Master of Technology: Nature Conservation	Nelson Mandela Metropolitan University	The feeding ecology of buffalo (*Syncerus caffer*) on Doornkloof Nature Reserve, Northern Cape, South Africa	2002-2006
Baccalaureus of Technology: Nature Conservation	Technikon Port Elizabeth	Plant studies IV; Research methodology; Fresh water management IV; Conservation management I; Principles of management I; Resource management IV	1998-1999
National Diploma: Nature Conservation	Technikon South Africa	Plant studies I, II and III; Animal studies I, II and III; Conservation Ecology I, II and III; Resource Management I, II and III; Conservation Communication I and II	1993-1996

3. Work experience

Institution	Institution details	Job description	Time period
Full time positions:			
	Department of Conservation Management, Faculty of Science, Nelson Mandela University, George Campus, Madiba Drive, George, 6530	*Associate Professor* *Head of Department: Conservation Management* *Program Coordinator: Nature Conservation and Game Ranch Management* *Senior Lecturer* *Lecturer*	1 January 2021 – current date 1 January 2021 – 31 December 2023 1 June 2017- 31 December 2020 1 January 2018 – 31 December 2020 1 June 2015- 31 December 2017
	Scientific Section, 6 St Marks Street, Southernwood, East London, South Africa, 5201. Tel: 043 7054400	*Specialist Ecologist* *Area of responsibility:* Eastern Cape Provincial Protected areas as well as National Marine Protected Areas *Responsible for:* Research, monitoring and specialist decision support on biodiversity conservation, protected area expansion and wildlife management. Manager of the Marine Scientific Unit (1 x Marine ecologist and 1 x Marine Technician) *Ecologist* *Area of responsibility*: Wild Coast (Mkambati, Silaka, Hluleka & Dwesa-Cwebe, East London Coast Nature Reserves; Pondoland, Hluleka & Dwesa-Cwebe Marine Protected Areas) also Baviaanskloof Mega Reserve *Responsible for*: Facilitating and conducting research, biological monitoring as well as decision support to conservation management	1 November 2011 – 31 May 2015 1st March 2006 – 31 October 2011
	School of Agricultural and Environmental Sciences, University of Limpopo, Private Bag X1106, Sovenga, 0727.	*Senior Technician* *Area of responsibility:* Aquaculture Research Unit *Responsible for:* Technical and research support for the research unit	1st May 2004 – 28th February 2006

Department: Environmental Affairs and Nature Conservation	Doornkloof Nature Reserve, PO Box 94, Colesberg, 9795	*Protected Area Manager* *Area of responsibility:* Doornkloof Nature Reserve *Responsible for:* General, conservation and wildlife management of the nature reserve	1st September 1998 – 28th April 2004
	Namakwa District Office, Private Bag X6, Calvinia, 8190	*District Nature Conservation Officer* *Area of responsibility:* Namakwa-Hantam District *Responsible for:* Law enforcement, environmental education, conservation advice and community liaison	6th January 1997 – 30th August 1998
Part-time/Contract positions: University of Pretoria	Centre for Wildlife Management, University of Pretoria, Pretoria, 0002	*Technician* *Area of responsibility:* Centre for Wildlife Management *Responsible for:* Technical and research support for the research unit	19th June 1996 – 31st December 1996
North-West Parks Board	Pilanesberg National Park, PO Box 1201, Mogwase, 0302	*Volunteer* *Area of responsibility:* Pilanesberg National Park *Responsible for:* Assisted field ecologist with data collection and field work	15th May 1996 – 17th June 1996
Cape Nature Conservation	Outeniqua Nature Reserve, Private Bag X6517, George, 6530	*Student Nature Conservator* *Area of responsibility:* Outeniqua Nature Reserve *Responsible for:* Assisted reserve manager with conservation management and field work	15th May 1995 – 6th May 1996

4. Ratings & Impacts

Agency	**Rating**
South African National Research Foundation	C3 (Rating)
Google Scholar	18 (h-index)
Scopus	15 (h-index)

5. Scientific output

Peer reviewed Journal Publications (shading indicates publications by postgraduate students and post-doctoral researchers under my supervision)	
1)	DEVARAJAN, K. et al (multiple authors) 2025. When the wild things are: Defining mammalian diel activity and plasticity. Science Advances. 11, eado3843. https://www.science.org/doi/full/10.1126/sciadv.ado3843
2)	OVERTON, E.K., DAVIS, R.S., PRUGNOLLE, F., ROUGERON, V., HONNIBAL, T, SIEVERT, O., VENTER, J.A. 2025 Carrion in Bomas: Multiple Observations of Cheetah(*Acinonyx jubatus*) Scavenging Events and Potential Causes in Managed Populations. Ecology and Evolution. https://doi.org/10.1002/ece3.70776
3)	FORTIN, D., BROOKE, C.F., FRITZ, H. & VENTER, J.A. 2024. The temporal scale of energy maximization explains allometric variations in movement decisions of large herbivores. Ecosphere. 15:e70101. https://doi.org/10.1002/ecs2.70101
4)	ZELLER ZIGAITIS, W.L, ROBINSON, A.C., VENTER, J.A., SPURIGO, L.T. & HOOG, A., 2024. Protected areas and disparate data: understanding geospatial data synthesis in poaching mitigation, Papers in Applied Geography. https://doi.org/10.1080/23754931.2024.2406470
5)	BERNARD, A., GUERBOIS, C., MOOLMAN, L., DE MORNEY, M.A., VENTER, J.A., FRITZ, H. 2024. Combining local ecological knowledge with camera traps to assess the link between African mammal life-history traits and their occurrence in anthropogenic landscapes. Journal of Applied Ecology. 2024;00: 1–13.

	https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2664.14742
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6)	TAMBLING C, VENTER J, DU TOIT JT, CHILD MF. 2016. A conservation assessment of *Syncerus caffer caffer*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.
7)	BURGER, M. & VENTER, J.A. 2013. Reptiles and Amphibians of Mkambati Nature Reserve In: Mkambati and the Wild Coast:

	South Africa and Pondoland's Unique Heritage, Second edition, by Div De Villiers and John Costello.
8)	DE VILLIERS, D. & VENTER, J.A. 2013. Mammal Species of the Pondoland Wild Coast. In: Mkambati and the Wild Coast: South Africa and Pondoland's Unique Heritage, Second edition, by Div De Villiers and John Costello.
Technical Reports	
1)	VENTER, J.A. & SWART, R., 2025. Terrestrial Animal Site Sensitivity Verification and Species Specialist Assessment Report - Proposed development of the Stanford Green Eco Estate residential area on Erf 438, Stanford. Technical Report prepared for Lornay Environmental Consulting, George, Western Cape, ZA.
2)	VENTER, J.A. & SWART, R., 2025. Terrestrial Animal Site Sensitivity Verification and Species Specialist Assessment Report Ver. 2- Proposed development of an eco-estate/beach resort on Portion 36 of Farm Franche Kraal 708, Overberg. Technical Report prepared for Lornay Environmental Consulting, George, Western Cape, ZA.
3)	VENTER, J.A. & PEEL, M.J.S. 2024. Limpopo National Park Water Supplementation Policy Review and Recommendations. Mozambique. Unpublished report, Peace Parks Foundation, Maputo, Mozambique.
4)	VENTER, J.A. & SWART, R., 2024. Terrestrial Animal Site Sensitivity Verification Report and Compliance Statement - Proposed expansion of the Aqunion (Pty) Ltd Abalone Farm, Romansbaai Farm Portion 2 of Klipfontein Farm no 711, Gansbaai. Technical Report prepared for Lornay Environmental Consulting, George, Western Cape, ZA.
5)	VENTER, J.A. & SWART, R., 2024. Terrestrial Animal Site Sensitivity Verification and Species Specialist Assessment Report - Proposed development of the Khoisan Bay Residential Development on Portion 2 of Farm Strandfontein No. 712, Gansbaai. Technical Report prepared for Lornay Environmental Consulting, George, Western Cape, ZA.
6)	VENTER, J.A., 2024. Terrestrial Animal Site Sensitivity Verification Report and Compliance Statement - 80MWac Solar PV+130MWh BESS, Portions 11 & 89 of Farm 183 Eastbrook, Karatara. Technical Report prepared for Celior (Pty) Ltd, George, Western Cape, ZA.
7)	VENTER, J.A. & SWART, R., 2024. Terrestrial Animal Site Sensitivity Verification Report and Compliance Statement - Proposed infrastructure upgrade and expansion of the tourist accommodation facilities on Rusty Gate Mountain Retreat, Farms 824, Rem. Farm 826 and Farm 887, in the Caledon District. Technical Report prepared for Lornay Environmental Consulting, George, Western Cape, ZA.
8)	VENTER, J.A., PEEL, M.J.S., & WOLFAARD, G.C.M. 2023. An ecological assessment of potential sanctuaries for White Rhino (*Ceratotherium simum*) in Limpopo National Park, Mozambique. Unpublished report, Peace Parks Foundation, Maputo, Mozambique.
9)	VENTER, J.A. 2024. Terrestrial Animal Site Sensitivity Verification Report and Species Specialist Assessment Report - Proposed development of Residential Erf 1486, Vermont, Hermanus. Technical Report prepared for Lornay Environmental Consulting, George, Western Cape, ZA.
10)	VENTER, J.A., PEEL, M.J.S., & WOLFAARD, G.C.M. 2023. An ecological assessment of potential sanctuaries for White Rhino (*Ceratotherium simum*) in Maputo National Park, Mozambique. Unpublished report, Peace Parks Foundation, Maputo, Mozambique.
11)	VENTER, J.A. 2023. Terrestrial Animal Compliance Statement Duthie's Golden Mole - *Chlorotalpa duthieae*, Eden Palms Residential, Property: Portion 21/438, Ladywood Estate, Plettenberg Bay.
12)	VENTER, J.A., FOUCHE, P.S.O, VLOK, W., MOYO, N.A.G., GROBLER, P., THERON, S. 2010. A guide to te development of conservation plans for southern African fish species. WRC Report No. 1677/1/10. Water Research Commission, Pretoria South Africa.
Presentations at conferences and symposia	
1)	VENTER, J.A., PARDO, L, OSNER, N.R., HUEBNER, S., NICVERT, L., SWANEPOEL, L., PEEL, M., SOMERS, M., KEITH, M., FRITZ, H. 2023 Running a large-scale, long-term camera trap monitoring project for conservation in Africa, the SnapshotSafari experience. 13th International Mammalogical Congress, Anchorage, Alaska, USA
2)	HONIBALL, T., VALEIX, M., FRITZ, H., SWANEPOEL, L. & VENTER, J.A. 2023 The Human-Wildlife Landscape: Effects of Fences as a Conservation Management Tool, 13th International Mammalogical Congress, Anchorage, Alaska, USA
3)	VENTER, J.A. & BETTINGS, I. (2022) Using a spatially explicit capture-recapture model to investigate the demography and spatial dynamics of lion prides in Pilanesberg National Park. 2nd North West Provincial Annual Biodiversity Research Symposium, Rustenburg, South Africa.
4)	VENTER, J.A. & SWARTZ, Y. (2019) Insights into past and present behaviour and impacts of a fast-growing elephant population in Madikwe Game Reserve. 1st North West Provincial Annual Biodiversity Research Symposium, Cookes Lake, Mahikeng, South Africa.
5)	VENTER, JA, BROOKE, C., MAREAN, C., FRITZ, H. & HELM, C. 2019. Conceptual reconstruction of Late Pleistocene large mammal assemblages of the Palaeo-Agulhas Plain reveals resilience to climate change but vulnerability to modern humans. 8th European Congress of Mammalogy, Warsaw, Poland.
6)	VENTER, JA, BROOKE, C., MAREAN, C., FRITZ, H. & HELM, C. 2019. Conceptual reconstruction of large mammal assemblages of the Palaeo-Agulhas Plain reveals resilience to climate change but vulnerability to modern humans. 29th International Congress for Conservation Biology (ICCB 2019), Kuala Lumpur, Malaysia.

7)	VENTER, JA, BROOKE, C., MAREAN, C., FRITZ, H. & HELM, C. 2019. Conceptual reconstruction of large mammal communities on the Palaeo-Aghulas Plain. Annual Meeting & Centennial celebration of the American Society of Mammalogists, Hyatt Regency Washington on Capitol Hill, Washington DC.
8)	VENTER, JA., VERMEULEN, MM., PACKER, C., SLOTOW, R., DOWNS, D., SOMERS, MJ., PEEL, M., SWANEPOEL, L., MGQATSA, N.,FRITZ, H., WILLOWS-MUNRO, S., KEITH, M., PARKER, D., LE ROUX, A. 2018. Snapshot Safari – South Africa: Contemporary applications of camera traps to monitor mammal communities in South African protected areas. Joint SANBI Biodiversity Information Management & Foundational Biodiversity Information Programme Forum, Cape St Francis, Eastern Cape, South Africa.
9)	VENTER, J.A., PRINS, H.H.T., MASHANOVA, A., & SLOTOW, R., 2017. Ungulates rely less on visual cues, but more on adapting movement behaviour, when searching for forage, 12th International Mammalogical Congress, Perth, Western Australia.
10)	VENTER, J.A., MARTENS, F.R., PFEIFFER, M.B., DOWNS, C.T. 2017. Cape vultures and wind turbines: Between a rock and a hard place. Southern African Wildlife Management Association Symposium: Wildlife management in the face of global change, Goudini, Western Cape Province, South Africa
11)	VENTER, J.A., PRINS, H.H.T., MASHANOVA, A., DE BOER, W.F., & SLOTOW, R., 2014. Intrinsic and extrinsic factors influencing large African herbivore movements. Southern African Wildlife Management Association Symposium: Reconciling the contradictions of wildlife management in southern Africa. Pine Lodge Resort, Port Elizabeth, Eastern Cape, South Africa.
12)	VENTER, J.A., PRINS, H.H.T., MASHANOVA, A., DE BOER, W.F., & SLOTOW, R., 2014. Intrinsic and extrinsic factors influencing large African herbivore movements. Spatial Ecology & Conservation 2, University of Birmingham, Birmingham, United Kingdom.
13)	VENTER, J.A., PRINS, H.H.T., BALFOUR, D.A., SLOTOW, R. 2013. Reconstructing grazer assemblages for protected area restoration in South Africa. 11th International Mammalogical Congress, Queens University of Belfast, Belfast, Northern–Ireland.
14)	VENTER, J.A., NABE-NIELSEN, J., PRINS, H.H.T., SLOTOW, R. 2012. Fire-patch foraging by red hartebeest and zebra in nutrient limited grassland under variable predation risk. Southern African Wildlife Management Association Symposium: Responsible Biodiversity Research and Wildlife Management, Klein Kariba, Limpopo Province, South Africa.
15)	VENTER, J.A., FOUCHE, P. & VLOK, W. 2010. The development of a conservation framework for threatened southern African fish. 24th International Congress for Conservation Biology, Edmonton, Canada.
16)	HAMER, M., SLOTOW, R. & VENTER, J.A. 2008. Patterns of invertebrate species richness and endemism in a protected area on the Pondoland Coast, South Africa. Southern African Wildlife Management Association Symposium: Wildlife Management – Biodiversity Conservation: The science-management interface. Impekweni Resort, Port Alfred, Eastern Cape, South Africa.
17)	VENTER, J.A., 2005. The feeding ecology of Cape buffalo on Doornkloof Nature Reserve, Northern Cape Province. Southern African Wildlife Management Association Symposium: Wildlife Management – A conservation or economic Incentive, Magoebaskloof, Limpopo Province South Africa.
18)	VENTER, J.A., HARLEY, V. & MALATJI, M.B. 2004. Game counts on Northern Cape Provincial Nature Reserves: Recommendations for future management. Southern African Wildlife Management Association Symposium: Innovations in Managing Wildlife Resources. Kathu, Northern Cape, South Africa.
19)	VENTER, J.A., 2001. The Karoo habitat of the Blue Crane (*Anthropoides paradiseus*). The 13th South African Crane Working Group Workshop and the Southern African Strategy Meeting, South African Crane Working Group. Howick, Kwazulu-Natal, South Africa.
Poster presentations	
1)	VENTER, J.A. 2011. The value of science to improve conservation management effectiveness in marine protected areas. World Marine Biodiversity Conference 2011, Aberdeen, Scotland. (Digital object presentation)
2)	VENTER, J.A., FOUCHE, P. & VLOK, W. 2010. The current distribution of *Opsaridium peringuyei* in South Africa: Is there reason for concern? 8th Annual Science Networking Meeting, Kruger National Park, Skukuza, Mpumalanga, South Africa.
3)	VENTER, J.A., MOYO, N., VLOK, W., FOUCHE, P. & GROBLER, J.P. 2005. The ecology and distribution of the Southern Barred Minnow (*Opsaridium peringueyi*) in some southern African river systems. Southern African Wildlife Management Association Symposium: Wildlife Management – A conservation or economic Incentive, Magoebaskloof, Limpopo, South Africa.

Grant funding	
National Research Foundation Bill Branch Memorial Grant Oppenheimer Trust Ernest and Ethel Eriksen Trust Copenhagen Zoo	Society for Conservation Biology National Geographic Society Forestry CETA Rufford Foundation Templeton Foundation

Shangani Ranch Amarula Elephant Fund The Elephant Managers Association The Palaeontological Scientific Trust Fynbos Trust Grootbos Foundation Fairfield Fund Dormehl Cunningham Scholarship Funding Cape Leopard Trust	Waitt Grants Program US National Science Foundation South African Water Research Commission Harry and Anette Swartz Foundation Lion Recovery Fund Tswalu Foundation Madikwe Wildlife Trust Panthera

Review of journal manuscripts

African Journal of Wildlife Research, African Journal of Marine Research, African Zoology, African Ecology, International Journal of Marine Science, Environmental Monitoring and Assessment, Ecological Applications, Acta Theriologica, Ecological Research, International Journal of Biodiversity and Conservation, PeerJ, Ecological Informatics, Mammal Research, Urban Forestry & Urban Greening, Journal of Arid Environments, Biodiversity and Conservation, Journal of Ornithology, Transportation Research Part D: Transport and Environment, Remote Sensing in Ecology and Conservation, Mammalia, Ecological Monographs, Kudu, Global Ecology and Conservation

Research reviews or supervisory panels

National Research Foundation	NRF Researcher Rating Review	2020 (Reviewer)
National Research Foundation	Postdoctoral, Travel, General and International Research Grants Virtual Peer Review Panel	2020 (Review Panel)
National Research Foundation	Postgraduate Bursaries/ Travel Grants Virtual Peer Review Panel	2019 (Review Panel)
National Research Foundation	Physiological plasticity of water-dependent antelope	2019 (Reviewer)
National Research Foundation	Mechanisms of resource selection and space use in a recovering rare antelope population	2018 (Reviewer)
Water Research Commission	WRC Project K5/2337 - Assessing the effect of global climate change on indigenous and alien fish in the Cape Floristic Region	2014-2017 (supervisory panel)
Water Research Commission	WRC Project K5/2039 - To understand the unintended spread and impact of alien and invasive fish species in order to develop mitigation and prevention guidelines.	2012-2014 (supervisory panel)
Water Research Commission	WRC Project K5/2187 – The resilience of South Africa's estuaries to future water resource development based on a provisional ecological classification of these systems.	2012-2014 (supervisory panel)
Water Research Commission	WRC Project K5/2261 - Evaluating fish and macro-invertebrate recovery rates in the Rondegat river, Western Cape, after river rehabilitation by alien fish removal using rotenone.	2013-2016 (supervisory panel)

Student supervision

BSc Hon/BTech

1) M. Mbiko	Honours degree (Zoology), Walter Sisulu University, Co-supervisor	The study of dietary niche separation for ungulates in Mkambati Nature Reserve, using the stable carbon isotopes	Completed (2014)
2) E. Jones	BTech (Nature Conservation), NMU, Supervisor	Amphibians and Vegetation as indicators of Conservation Value of Wetlands in an Anthropogenically Impacted Landscape	Completed (2016) *Cum Laude*
3) K. Green	BTech (Nature Conservation), NMU, Supervisor	Variables affecting mammal species rate of capture as evaluated by camera traps on Tswalu Kalahari Reserve	Completed (2016)
4) B White	BTech (Nature Conservation), NMU, Supervisor	Water Bird Counts Along the Klein Brak River: A Study on the Precision of Citizen Science Counts	Completed (2016)
5) P Rossouw	BTech (Nature Conservation), NMU, Supervisor	Herpetological biodiversity in areas adjacent to the Wilderness section of the Garden Route National Park	Completed (2016)

6) S. Schimmel	BTech (Nature Conservation), NMU, Supervisor	Mammal diversity and density in transformed and natural landscapes of a conservation corridor adjacent to the Garden Route National Park, Western Cape	Completed (2016)
7) S. Atkinson	BTech (Nature Conservation), NMU, Supervisor	The precision of waterfowl numbers through Co-ordinated Waterbird Counts on the Great Brak Estuary	Completed (2016)
8) A. Robinson	BTech (Nature Conservation), NMU, Supervisor	Does distance from water influence herbivore assemblages in Kruger National Park?	Completed (2017)
9) D. van Aswegen	BTech (Nature Conservation), NMU, Supervisor	The effect of forest fragmentation on forest bird diversity and movement in a plantation dominated landscape	Completed (2017)
10) KL Midlane	BTech (Nature Conservation), NMU, Supervisor	Amphibian and reptile biodiversity patterns in commercial plantations of the Southern Cape	Completed (2017)
11) M. Gouws	BTech (Nature Conservation), NMU, Supervisor	Do different herbivores influence soil nitrogen levels in Satara, Kruger National Park?	Completed (2017)
12) O. Rynders	BTech (Nature Conservation), NMU, Supervisor	Forest fragmentation and its effects on invertebrate diversity and abundance	Completed (2017) *Cum Laude*
13) Z. Schoeman	BTech (Nature Conservation), NMU, Supervisor	The effect of anthropogenic disturbance on marine shorebird population size and habitat use in the Garden Route	Completed (2017)
14) D. de Villiers	BTech (Nature Conservation), NMU, Supervisor	The herpetological diversity in the Karoo National Park in South Africa	Completed (2018)
15) C. Esmeraldo	BTech (Nature Conservation), NMU, Supervisor	The influence of vegetation and water on ungulate distribution in the Karoo National Park	Completed (2018)
16) A. Laas	BTech (Nature Conservation), NMU, Supervisor	The activity patterns of herbivores exposed to predators in the Karoo National Park, South Africa	Completed (2018)
17) J. Dicker	BTech (Nature Conservation), NMU, Supervisor	The activity patterns of species exposed to large predators in the Mountain Zebra National Park	Completed (2018)
18) S. Truter	BSc Hons (Wildlife Management), UP, Co-Supervisor	Effects of medium to large carnivores on small carnivores in space and time in the Telperion Nature Reserve	Completed (2018)
19) N. Nkosi	BTech (Nature Conservation), NMU, Supervisor	Ungulates response to old agricultural fields in Gondwana Game reserve	Completed (2019)
20) I. Bettings	BTech (Nature Conservation), NMU, Supervisor	Habitat variations influencing the frequency of bird strikes in high air traffic areas within the George Airport	Completed (2019)
21) D. Ball	BTech (Nature Conservation), NMU, Supervisor	Large tree utilisation of the African Elephant (*Loxodonta africana*) in the Savanna biome	Completed (2019)
22) G. Reynolds	BTech (Nature Conservation), NMU, Supervisor	Assessing impacts of African elephant (*Loxodonta africana*) on the vegetation of Gondwana Private Game Reserve	Completed (2019)
23) K. Smith	BSc Hons (Wildlife Management), UP, Co-Supervisor	Testing the spatial and temporal avoidance hypothesis in a semi-arid landscape: Do subordinate carnivores of the Karoo change behaviour in response to dominant predators?	Completed (2019) *Cum Laude*
24) G. Sambula	BSc Hons (Zoology),	Carnivore Richness In Private And State	Completed (2019)

	UNIVEN, Co-Supervisor	Protected Areas	
25) T. Baird	BSc Hons (Wildlife Management), UP, Co-Supervisor	Spatial and temporal avoidance between large and meso-carnivores	Completed (2020)
26) A. Gervais	BSc Hons (Wildlife Management), UP, Co-Supervisor	Investigating the impact of large carnivores on mesocarnivores' temporal dynamics	Completed (2020)
27) Miss E.E.M. Evers	BSc Hons (Wildlife Management), UP, Co-Supervisor	Spatial and temporal organization of leopards (*Panthera pardus*) and spotted hyaena (*Crocuta crocuta*) on Madikwe Game Reserve	Completed (2020)
28) Mr R. Pienaar	BSc Hons (Animal, Plant & Environmental Science), WITS, Co-Supervisor	Do lions with long, dark manes behaviourally compensate for potentially high heat loads?	Completed (2020)
29) Mr I Kayiza	BSc Hons (Wildlife Management), UP, Co-Supervisor	Edge effect and its impacts on the abundance of mammal species in selected protected areas in South Africa	Completed (2020)
30) Mr N.K. Shah	BSc Hons (Wildlife Management), UP, Co-Supervisor	Do herbivores change their behaviour in the absence of lions in arid areas of SA?	Completed (2021) *Cum Laude*
31) Miss M. Thomson	BSc Hons (Wildlife Management), UP, Co-Supervisor	Herbivore space use in Atherstone Nature Reserve, Limpopo Province, South Africa.	Completed (2021) *Cum Laude*
32) Miss T. Tiribeni	BSc Hons (Wildlife Management), UP, Co-Supervisor	The effect of lion pride structure on home ranges	Completed (2022)
33) Miss K. Mieny	BSc Hons (Wildlife Management), UP, Co-Supervisor	A Preliminary Assessment of the Seasonal Difference and Influence of Megaherbivores on the Diets of Large Herbivores in Sanbona Wildlife Reserve	Completed (2022)
34) Mr A. van Niekerk	BSc Hons (Wildlife Management), UP, Co-Supervisor	Leopard tortoise occupancy in arid reserves in South Africa: assessment using camera traps.	Completed (2022)
35) Miss H. Basson	BSc Hons (Natural Resource Management), NMU, Co-supervisor	Factors influencing Chondrichthyan egg case hatching success in Mossel Bay, South Africa	Completed (2023) *Cum Laude*
36) Miss Y. Markides	BSc Hons (Natural Resource Management), NMU, Supervisor	The Development of a Condition Scoring System for White Rhinoceros (*Ceratotherium simum*), using expert knowledge	Completed (2023)
37) Mrs Rebecka Ryan	BSc Hons (Natural Resource Management), NMU, Supervisor	Opportunistic utilisation of resource pulses by a mesopredator in Welgevonden Game Reserve, South Africa	Completed (2023) *Cum Laude*
38) Mr D Stols	BSc Hons (Natural Resource Management), NMU, Co-supervisor	Elephants reduce vegetation diversity and affect tree structure in Madikwe Game Reserve	Completed (2023) *Cum Laude*
39) Mr T. Fifford	BSc Hons (Natural Resource Management), NMU, Supervisor	An assessment of a decade of surf-zone linefish monitoring in the Goukamma Marine Protected Area: Is the current resource use zonation effective?	Completed (2023) *Cum Laude*
40) Mr D.J.S. Samarasinghe	BSc Hons (Natural Resource Management), NMU, Supervisor	On the population ecology of an island leopard from a protected landscape	Completed (2023)

41) Miss S Rich	BSc Hons (Wildlife Management), UP, Co-Supervisor	The effect of vehicles on black-backed jackal (*Lupulella mesomelas*) and leopard (*Panthera pardus*) activity	Completed (2023)
42) Miss M. Venter	BSc Hons (Wildlife Management), UP, Co-Supervisor	Drivers of free-roaming African wild dog land use in the Waterberg, South Africa	Completed (2023)
43) Miss C Meyer	BSc Hons (Wildlife Management), UP, Co-Supervisor	Assessing the Indirect Effect of Elephants on Bird & Bat Assemblages	Completed (2024)
44) Mr K. Saloojee	BSc Hons (Natural Resource Management), NMU, Co-Supervisor	Testing a Novel Camera Trapping Method to Survey African Small Carnivore Populations	Completed (2024)
Masters			
1) Mr E. Mmonoa	MSc (Zoology), University of Limpopo, Co-supervisor	Breeding habitat of Blue crane (*Anthropoides paradiseus*) in Mpumalanga	Completed (2010)
2) Miss M. Pfeiffer	Msc (Zoology), University of Kwazulu-Natal, Co-supervisor	Understanding the association between Cape Vultures (*Gyps coprotheres*) and communal farmland.	Upgraded to PhD (2013)
3) Mrs M. Vermeulen	MSc (Nature Conservation), NMU, Co-supervisor	Exploring feeding ecology and population growth rate responses of ungulates in southern African arid biomes	Completed (2016-2017)
4) Mr C. Brooke	MSc (Nature Conservation), NMU, Supervisor	Energy maximisation strategies of different African herbivores in a fire dominated and nutrient poor grassland ecosystem	Completed (2016-2017) *Cum Laude*
5) Miss F. Martens	MSc (Nature Conservation), NMU, Supervisor	The spatial ecology and roost site selection of fledging Cape Vultures (*Gyps coprotheres*) in the Eastern Cape, South Africa.	Completed (2016-2017) *Cum Laude*
6) Mrs T. Meintjes	MSc (Nature Conservation – Part time), NMU, Supervisor	Using citizen science data to evaluate waterbird populations in the Garden Route	Deregistered (2016-2020) Not completed
7) Miss D. Winterton	MSc (Nature Conservation), NMU, Supervisor	Land use and ecosystem regulation: Exploring the influence of management practise on mesopredator and herbivore interactions	Completed (2017-2018)
8) Mr J. Vogel	MSc (Nature Conservation), NMU, Supervisor	Predicting reintroduction outcomes: Assessing the feasibility of reintroducing African wild dog to a small protected area.	Completed (2017-2018) *Cum Laude*
9) Miss C. Young	MSc (Nature Conservation), NMU, Supervisor	Examining the influence of extrinsic factors on herbivore assemblage composition and resultant nutrient feedbacks in Kruger National Park	Completed (2017-2018)
10) Miss A. Robinson	MSc (Nature Conservation), NMU, Supervisor	The influence of water dependency on the spatial ecology of large mammalian herbivores on the paleo-Agulhus plain	Deregistered (2018-2022) Not completed
11) Miss Z. Schoeman	MSc (Nature Conservation), NMU, Supervisor	The spatiotemporal aspects of predation on the Cape gannet *Morus capensis* population at Bird Island, Lambert's Bay, Western Cape, South Africa	Completed (2018-2019)
12) Mr P. Faure	MSc (Nature Conservation), NMU, Supervisor	The influence of anthropogenic and environmental covariates on the habitat use and density of sympatric carnivores, Limpopo Province, South Africa	Completed (2018-2019)
13) Miss YRP. Swartz	MSc (Nature Conservation), NMU, Supervisor	Elephants in Madikwe Game Reserve: Measuring past and future impacts	Deregistered (2018-2021) Not completed

14) Miss C. Burt	MSc (Nature Conservation), NMU, Supervisor	An assessment of different methods for measuring mammal diversity in two Southern African arid ecosystems	Completed (2018-2020)
15) Miss A. Jansen-van Vuuren	MSc (Nature Conservation), NMU, Supervisor	The feeding ecology and habitat selection of small antelopes in the Overberg Renosterveld, Western Cape	Completed (2019-2020)
16) Mr H. Swanepoel	MSc (Nature Conservation), NMU, Supervisor	The implications of landscape scale habitat fragmentation and ecological corridors on the spatial ecology of five specialist browser species in a lowland Fynbos and Renosterveld ecosystem.	Completed (2019-2020)
17) Miss T. Honiball	MSc (Nature Conservation), NMU, Supervisor	Estimating the population size of three large carnivore species and the diet of six large carnivore species, in Madikwe Game Reserve	Completed (2019-2020)
18) Miss N. Tsie	MSc (Wildlife Management), UP, Co-supervisor	The interaction between burrowing mammal occurrence and large carnivore presence in South Africa	Deregistered, Not completed (2019-2022)
19) Mrs C. Shutte	MSc (Nature Conservation), NMU, Supervisor	Understanding what factors determine the birth-sex ratio of Chacma baboons (*Papio ursinus*) on the Cape Peninsula	Deregistered, Not completed (2020-2023)
20) Miss I. Bettings	MSc (Nature Conservation), NMU, Supervisor	Using spatial explicit capture-recapture model to investigate the demography and spatial dynamics of lion prides in Pilanesberg National Park	Completed (2020-2021)
21) Mr Kyle Smith	MSc (Wildlife Management), UP, Co-supervisor	Testing the spatial and temporal avoidance hypotheses: Do subordinate carnivores change behaviour in response to dominant carnivores?	Completed (2020-2022)
22) Mr D. Ball	MSc (Nature Conservation), NMU, Supervisor	Do African elephants (*Loxodonta africana*) use artificial water points as central forage stations in the Madikwe Game Reserve?	Deregistered (2020-2021) Not completed
23) Miss J. Daya	MSc (Nature Conservation), NMU, Supervisor	Feeding ecology and habitat preference of black rhino (*Diceros bicornis*) in Welgevonden Game Reserve, Limpopo Province.	Completed (2020-2021)
24) Mr TD Baird	MSc (Wildlife Management), UP, Co-supervisor	Implications of camera trap survey design and analytical methods for large carnivore estimates	Completed (2021)
25) Miss J. Harris	MSc (Nature Conservation), NMU, Supervisor	Investigating the effects of pulse-driven resource availability on mammal communities in the Kalahari, South Africa	Completed (2021-2022)
26) Mr Markus Woesner	MSc (Conservation and Management of Fish and Wildlife), Swedish University of Agricultural Science, Co-supervisor	Does the response to hot temperatures differ among species in a large herbivore community in the southern Kalahari? A landscape of risk versus heat	Completed (2022-2023)
27) Mr Samuel Ralph Davidson-Phillips	MSc (Nature Conservation), NMU, Supervisor	Estimation of a generalist meso-carnivore (Black-backed Jackal) population from a fenced protected area	Completed (2022-2023) *Cum Laude*
28) Mr Moraswi Masehle	Magister Science Wildlife Health, Ecology and Management, University of Pretoria, Co-supervisor	The Activity Patterns of the Specialized Browsing Species and their Behavioral Adjustments in Response to Predation	In progress (2022)
29) Mr Jaco Geldenhuys	Master of Scientiae (MSc) in Environmental	Occupancy of black-backed jackal (*Canis mesomelas* Schreber, 1775) across South	In progress (2021-2022)

	Management, University of Pretoria, Co-supervisor	Africa	
30) Miss Cleo Ferreira	MSc (Nature Conservation), NMU, Supervisor	Evaluating the impact of dehorning on the behavioural ecology of white rhinoceros (*Ceratotherium simum*)	In progress (2023-2024)
31) Mrs Rebecca Ryan-Stolz	MSc (Nature Conservation), NMU, Supervisor	Estimating population density and assessing territoriality of African lions (Panthera leo) in Kruger National Park, South Africa	In progress (2024-2025)
32) Miss Yasmin Markides	MSc (Nature Conservation), NMU, Supervisor	Assessing landscape permeability and dispersal corridors for threatened carnivores across a multi-use landscape	In progress (2024-2025)
33) Miss Hannah Basson	MSc (Nature Conservation), NMU, Supervisor	A landscape-level evaluation of black-footed cat (*Felis nigripes*) distribution in the south-eastern Karoo	In progress (2024-2025)
34) Mr Dietre Stolz	MSc (Nature Conservation), NMU, Co-Supervisor	Giants of the Savannah: Unravelling the Impact of Elephant Preferences on Woody Vegetation in Madikwe and Timbavati Game Reserves.	In progress (2024-2025)
35) Miss Carina Meyer	MSc (Nature Conservation), NMU, Supervisor	The influence of complex social structures with fission-fusion properties on foraging efficiency and spatial dynamics of buffalo herds in the APNR	In progress (2025-2026)
Doctoral			
1) Miss M. Pfeiffer	PhD (Zoology), University of Kwazulu-Natal, Co-supervisor	Ecology and conservation of the Cape Vulture in the Eastern Cape, South Africa	Completed 2016
2) Mr W. Matthee	PhD (Nature Conservation – Part time), NMU, Supervisor	Forest birds and habitat fragmentation: evolutionary adaptations to environmental change	Deregistered, Not completed (2016-2022)
3) Mrs MM. Vermeulen	PhD (Nature Conservation), NMU, Supervisor	Variation in abundance and structure of mammal communities and the consequences for species diversity	In progress (2018-2022)
4) Mrs FR. Brooke	PhD (Nature Conservation), NMU, Supervisor	Cape Vultures and their increasing threats: a race to extinction?	Completed (2018-2021)
5) Mr CF. Brooke	PhD (Nature Conservation), NMU, Supervisor	Large mammalian fauna of the Palaeo-Agulhas Plain: Predicting habitat use and range distribution	Completed (2018-2020)
6) Mr P. Mkumba	PhD (Nature Conservation), NMU, Co-Supervisor	Migration patterns of male elephants (*Loxodonta africana*) in the Hwange-Shangani corridor: Consequences on Human Elephant Conflict	In progress (2019-2022)
7) Mr W. Conradie	PhD (Nature Conservation), NMU, Supervisor	Herpetofaunal diversity and affiliations of the Okavango River Basin, with specific focus on the Angolan headwaters.	Completed (2020-2023)
8) Miss A. Bernard	PhD (Zoology) REHABS International Research Laboratory, CNRS-Université Lyon 1-Nelson Mandela University, Co-Supervisor	Trophic guild distortion in anthropogenic landscapes – Testing anthropodependence and reconciliation ecology principles of mammals in the Greater Cape Floristic Kingdom.	Completed (2020-2022)
9) Mr GS. Botha	PhD (Nature Conservation), NMU, Supervisor	The effects of fences and other infrastructure on the mammal community structure and distribution in protected areas across South Africa.	In progress (2020-2024)

10) Dr C. Helm	PhD (Geoscience), NMU, Co-supervisor	Pleistocene fossil tracks and traces on the Cape coast of South Africa	Completed (2020-2023)
11) Mrs Z. Strydom	PhD (Nature Conservation), NMU, Supervisor	Assessing the effects of fish stock management on endangered seabird populations in South Africa	Completed (2020-2023)
12) Mrs W.L. Zeller Zigaitis	PhD (Geography), Pennsylvania State University, Co-supervisor	Protected Area Process and Design: Using Geospatial Data to Mitigate Poaching in Protected Areas	Completed (2020-2024)
13) Miss T. Honiball	PhD (Nature Conservation), NMU, Supervisor	Social dynamics of spotted hyaenas (*Crocuta crocuta*) in fenced protected areas: Implications for conservation management of a socially intelligent species.	Completed (2021-2024)
14) Miss A. Jansen van Vuuren	PhD (Nature Conservation), NMU, Supervisor	The role of spotted and brown hyaena activity hotspots on interspecific interactions	In progress (2021-2024)
15) Mr H. Swanepoel	PhD (Nature Conservation), NMU, Supervisor	The effects of climate on the phenology of African ungulates in arid and semi-arid regions of South Africa.	In progress (2022-2024)
16) Miss J Daya	PhD (Nature Conservation), NMU, Supervisor	Managing Lions in Pilanesberg National Park: Finding a Balance between Economic and Ecological Realities in Fenced Parks	In progress (2023-2025)
17) Miss J Harris	PhD (Nature Conservation), NMU, Supervisor	A Game of Thrones: Rivals, territories and resources. What are the intrinsic costs to African lions contained in small, fenced parks?	Deregistered (2023-2023) Not completed.
18) Mr S Tokota	PhD (Nature Conservation), NMU, Supervisor	A regional assessment of leopard (Panthera pardus) population status, threats, distribution, and habitat connectivity in the Eastern Cape, South Africa	In progress (2023-2025)
19) Miss E Overton	PhD (Nature Conservation), NMU, Supervisor	The ecological role of cheetah (*Acinonyx jubatus)* and their impact on prey populations on Tswalu Kalahari Reserve	In progress (2023-2026)
20) Miss M Rodriguez	PhD Biodiversity (U. of Barcelona), Supervisor	Enhancing Coexistence: Understanding Large Carnivore Mobility in Different Wildlife-Based Land Use Patterns in South Africa	In progress (2024-2026)

Post-Doctoral Researchers & Research fellows		
1) Dr L. Pardo-Vargas	Snapshot Safari South Africa – A country wide assessment of mammal biodiversity	FBIP-NRF Post-Doctoral Researcher (2019-2020) NRF Innovation Postdoctoral Fellowship (2021-2022)
2) Dr C. Guerbois	Social-Ecological Systems	NMU Research Fellow (2019-2023)
3) Dr D. Marneweck	Snapshot Safari South Africa – A country wide assessment of mammal biodiversity	NMU Post-Doctoral Research Fellow (2020-2021)
4) Dr C. Brooke	Late Pleistocene herbivore use on the Palaeo-Agulhas Plain: the facilitation role of megaherbivores and the implications for the modern rewilding of landscapes	NRF Innovation Postdoctoral Fellowship (2021-2022)
5) Dr R. Davies	Assessing the density, distribution and spatiotemporal dynamics of small carnivores across African conservation landscapes	NMU Post-Doctoral Research Fellow (2022-2023)
6) Dr Chad Keates	Genetic study on herpetological samples from Angola in association with Werner Conradie, PE Museum.	NMU Post-Doctoral Researcher (2022)
7) Dr L Thel	A Game of Thrones: Rivals, territories and resources. What are the intrinsic costs to African lions contained in small, fenced parks?	FBIP-NRF Post-Doctoral Researcher (2023-2024) NMU Post-Doctoral Research Fellow (2025-2026)

6. Experience in Teaching & Learning

Teaching experience			
Time period	Institution	Module or Course Information	
2015-current	Nelson Mandela University	I teach Animal Studies I/Game Health I & Animal Studies III/Game Science III to undergraduates (Diploma in Nature Conservation and Diploma in Game Ranch Management), Conservation Management and Plant Studies IV (BTech Nature Conservation), Game Science IV/Animal Studies IV (Advanced Diploma in Game Ranch Management & Advanced Diploma Nature Conservation), Conservation Management (BSc Hons Natural Resource Management).	
2022 (April-May)	Swedish University of Agricultural Sciences	Visiting lecturer at the Department Wildlife, Fish and Environmental Studies, Umea. Course work Masters degree, International Wildlife Management Module. Sweden-South Africa Erasmus ICM exchange program on wildlife ecology and management	
2010-2018	Pennsylvania State University/University of Cape Town	Assisted in setting up and hosting a study abroad program called People and Parks South Africa (http://aeseda.psu.edu/programs/parks-and-people-south-africa/). The students spend 10 weeks in South Africa (January-March) on an annual basis. I was one of the South African field lecturers for the program and presented practical biodiversity surveys (where we physically conducted biodiversity inventory surveys on various protected areas) and since 2013 an introductory course to conservation in South Africa. This course (2 weeks) introduced students to South African ecological and biodiversity features as well as various protected area management models while traveling from Cape Town to their base (Wild Coast, Eastern Cape).	
2005	University of Limpopo	Taught GIS to 1st and 2nd year students for one semester as substitute lecturer at the Department of Geography	
Curriculum Development & Review			
2019	Nelson Mandela University	Development of the new Advanced Diploma: Nature Conservation	Team leader of course development team
2018-2019	Nelson Mandela University	Development of the new BSc Honours: Natural Resource Management	Team member of the course development team
2020	University of South Africa	Review of the Postgraduate Diploma: Nature Conservation	Chairman of the external review committee
2020	Southern African Wildlife College	Review of a new Diploma: Applied Natural Resource Management	External reviewer

7. Professional membership and service

Association	**Details**	**Time period**
South African Wildlife Management Association	Ordinary member (Council member 2008-2010; 2018-2023)	1998-Current date
Zoological Society of Southern Africa	Ordinary member	2009-2023
IUCN Crocodile Specialist Group	Ordinary member	2013-Current date
Mammal Research Institute, University of Pretoria	Research Associate	2013-Current date
Centre for Coastal Palaeo Science, NMU	Honorary Researcher	2016-Current date
South African Council for Natural Scientific Professions	Professional Natural Scientist – Ecological Sciences: Registration Number. 400111/14	2014-Current date
Associated Private Nature Reserves Ecological Advisory Committee	Committee member	2022 – Current date
Welgevonden Game Reserve Scientific Advisory Committee	Committee member	2018-Current date
BirdLife South Africa and Endangered Wildlife Trust - Birds and Renewable Energy Specialist Group	Specialist advisor	2019-2021
SEA REDZs Vulture Working Group	Specialist	2024-Current date

REHABS International Research Laboratory, CNRS-Université Lyon 1-Nelson Mandela University, George Campus	Research Associate	2019-Current date
Society for Conservation Biology	Professional Member	2020-Current date
Centre for African Conservation Ecology, Nelson Mandela University	Member	2022-Current date

8. Other courses and qualifications

List of qualifications obtained	List of courses completed
Professional Hunter; Category C Skippers License; Marine VHF Radio Operator; NAUI Open Water 1 SCUBA Diver	Statistical Techniques in Ecology, Snake ID & Snakebite Treatment; Advanced Snake Handling; Conservation Planning; Practical Remote Sensing for Conservation Biologists; Ecological Niche Modelling; Landscape genetic approaches for Conservation Biologists; Resource evaluation and game ranch management for sustainable game production and conservation; Disease Risk Assessment; Game counting techniques; Wildlife handling and welfare; Maintenance of outboard motors and handling of boats on inland waters; Various ArcView, ArcGIS courses; Quantum GIS Various Windows Software courses; Financial management systems; Peace officer; Problem animal control.

9. Referees

Prof. Herbert Prins
Full Professor & Former Chairman of the Graduate School Production Ecology
Resource Ecology Group, Wageningen University
Herbert.Prins@wur.nl
Cell: +31653128968

Prof. Rob Slotow
School of Life Sciences
University of Kwazulu-Natal
Slotow@ukzn.ac.za
Tel: +27(31) 2602798
Cell: +27(83) 6817136

Prof. Michael Somers
Professor
Mammal Research Institute, University of Pretoria
Michael.Somers@up.ac.za
Cell: +27(72) 1007022

SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Jan Adriaan Venter

Registration Number: 400111/14

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule 1 of the Act)

Ecological Science (Professional Natural Scientist)

Effective **12 March 2014** Expires **31 March 2026**

Chairperson

Chief Executive Officer

To verify this certificate scan this code

RUDI CRISPIN SWART (PhD)

Postdoctoral Research Fellow, Nelson Mandela University

(+27) 84 945 2085 swartrudolph90@gmail.com

Surname	Swart
Full names	Rudi Crispin
Gender	Male
Date of birth	12/02/1991
Nationality	South African
Driver's license	Yes
Criminal Record	No
Current Location (City)	George
Willing to Relocate	Yes

EDUCATION

- **Stellenbosch University** Completed 2020

PhD in Conservation Ecology: **Interactions between indigenous southern Afrotemperate forest trees and arthropod diversity**

- **Stellenbosch University** Completed 2016

MSc (cum laude) in Conservation Ecology: **The effect of commercial forestry plantations and roads on southern Afrotemperate forest arthropod diversity**

- **Stellenbosch University** Completed 2013

BSc Conservation Ecology & Entomology

EXPERIENCE

Forest Programme Manager April 2025 - present
NVT, Nature's Valley

- Ecological Research, Indigenous Forest Management, Forest Monitoring, Funding Acquisition, Stakeholder Engagement

Postdoctoral Research Fellow April 2021 – March 2025
Department of Natural Resource Management, Faculty of Science, Nelson Mandela University

Research focus: Afromontane forest tree pollination and germination; pollinator diversity conservation and insect seed predation

- Research
- Academic writing and publication
- Grant acquisition
- Organising and conducting fieldwork / laboratory work

- Managing research funds
- Student supervision – 1 honours (2024); 2 masters students (2024)
- Part-time lecturing – first year Animal Studies, honours and advanced diploma indigenous forest electives
- Student training in entomology, curation, taxonomy, field work and ethics

Lecturer — Jan 2022 – Dec 2022; Jan 2024 – Jul 2024
Department of Natural Resource Management, Nelson Mandela University

- Animals studies I (invertebrate ecology) and II (vertebrate ecology)

Educator, Cambridge Curriculum — Jan 2021 – April 2021
McKinlay Reid International School, George

- Teaching position in Biology (AS-level) and Environmental Management (IG-level)

Consolidoc (6-month research funding) — Jun 2020 – Nov 2020
Department of Conservation Ecology and Entomology, Stellenbosch University

- Full-time researcher
- Published 3 scientific articles

Rehabilitation Ecologist – flexitime during PhD — Jan 2016 – Dec 2018
Oude Bethlehem Farm, Banhoek Valley

- Developed a rehabilitation strategy and implemented a plan for degraded fynbos and Afromontane forests on a large, >300 ha farm
- Engaged with multiple stakeholders

FUNDING APPLICATIONS

Erasmus+ Mobility – awarded after applying for a 7-week lecturing mobility programme between Nelson Mandela University and the Swedish University of Agricultural Sciences (SLU) wherein knowledge exchange between South African and Swedish forest ecology were facilitated via field excursions, lectures and seminars at SLU, Umeå campus (2024). *R160 000.*

National Research Foundation – Innovation Postdoctoral Scholarship (2023-2025). Reference number: PSTD220324610. *R255 000.*

Rufford Small Grants – awarded after applying for funding for postdoc research costs (2021-2023). *R120 000.*

Nelson Mandela University Postdoctoral Award – awarded after submitting a research proposal (2021-2023). *R204 000.*

Stellenbosch University Research Consolidoc – awarded after PhD to assist high-research output scholars to write scientific papers full-time (2020). *R60 000.*

Stellenbosch University Merit Bursary – awarded after receiving a Master of Science *cum laude*. (2016-2017). *R20 000.*

National Research Foundation – Scarce skills Doctorate Scholarship (2016-2018). Reference number: SFH150723130214. *R360 000.*

National Research Foundation – Innovation Masters Scholarship (2015). Reference number: SFH13090332614. *R80 000.*

National Research Foundation – Scarce skills Masters Scholarship (2014). Reference number: SFH150723130214. *R 70 000.*

Isaac Greenberg - Prospective first-year students with an exceptionally high level of scholastic achievement (2010-2012).

PUBLICATIONS

Swart, R. C., Bradley, S., & Staude, H. (2024). A first ecological description of the lichen-clad larva of *Eublemmistis chlorozonea* Hampson, 1902 (Lepidoptera: Erebidae) from a southern Afrotemperate forest. *Metamorphosis.*

Swart, R. C., New, T. R., Kotze, J., & Samways, M. J. (2024) (*book chapter*). Insect conservation in boreal and temperate forests. *Routledge Handbook of Insect Conservation.* https://doi.org/10.4324/9781003285793

Swart, R. C., Geerts, S., Pryke, J. P., & Coetzee, A. (2024). Generalist southern African temperate forest canopy tree species have distinct pollinator communities partially predicted by floral traits. *Austral Ecology.* https://doi.org/10.1111/aec.13523

Swart, R. C., Geerts, S., Geldenhuys, C. J., Pauw, J. & Coetzee, A. (2023). Weak latitudinal trends in reproductive traits of Afromontane forest trees. *Annals of Botany, mcad080.*

Swart, R. C., Samways, M. J., & Roets, F. (2022). Interspecific green leaf-litter selection by ground detritivore arthropods indicates generalist over specialist detritivore communities. *Applied Soil Ecology, 174.*

Swart, R. C., Samways, M. J., & Roets, F. (2021). Latitude, paleo-history and forest size matter for Afromontane canopy beetle diversity in a world context. *Biodiversity and Conservation, 30, 659-672.*

Swart, R. C., Samways, M. J., & Roets, F. (2020). Tree canopy arthropods have idiosyncratic responses to plant ecophysiological traits in a warm, temperate forest complex. *Scientific Reports, 10, 19905.*

Swart, R. C., Samways, M. J., Pryke, J. S., & Roets, F. (2020). Overhead tree canopy species has limited effect on leaf litter decomposition and decomposer communities in a floristically diverse, southern temperate rainforest. *Applied Soil Ecology, 156.*

Swart, R. C., Samways, M. J., Pryke, J. S., & Roets, F. (2020). Individual tree context and contrast dictate tree physiological features and arthropod biodiversity patterns across multiple trophic levels. *Ecological Entomology*, 45, 333-344.

Swart, R. C., Pryke, J. S., & Roets, F. (2019). The intermediate disturbance hypothesis explains arthropod beta-diversity responses to roads that cut through natural forests. *Biological Conservation*, *236*, 243-251.

Steed, A., **Swart, R. C.**, Pauw, M. J., & Roets, F. (2018). Response of arthropod communities to plant-community rehabilitation efforts after strip mining on the semi-arid west coast of South Africa. *African Journal of Range & Forage Science, 35*, 375-385.

Swart, R. C., Pryke, J. S., & Roets, F. (2018). Arthropod assemblages deep in natural forests show different responses to surrounding land use. *Biodiversity and Conservation, 27*, 583-606.

Swart, R. C., Pryke, J. S., & Roets, F. (2017). Optimising the sampling of foliage arthropods from scrubland vegetation for biodiversity studies. *African Entomology*, *25*, 164-174.

REPORTS / MODULES WRITTEN

Terrestrial Animal Site Sensitivity Verification and Species Specialist Assessment Report – Proposed development of the Khoisan Bay Residential Development on Portion 2 of Farm Strandfontein 712, Gansbaai. October 2024.

Terrestrial Animal Site Sensitivity Verification and Species Specialist Assessment Report – Proposed development of an eco-estate / beach resort on Portion 36 of Farm Franche Kraal 708, Overberg. September 2024.

Terrestrial Animal Site Sensitivity Verification Report and Compliance Statement – Proposed infrastructure upgrade and expansion of the tourist accommodation facilities on Rusty Gate Mountain Retreat, Farms 824, Rem Farm 826 and Farm 887, in die Caledon District. July 2024.

Implementation plan to rehabilitate the edge on Idille Farm (Erf 387). Detailed implementation strategy to restore a transformed indigenous forest edge back to a natural state on a farm along the seven passes road, Wilderness. April 2023.

Portland Rehabilitation Strategy. Detailed implementation strategy to rehabilitate 600 hectares of alien invaded farmland back to fynbos and forest, including the design and costs of an indigenous nursery, the benefit of indigenous vegetation on macadamia seed set and the novel design of an indigenous windbreak for macadamia orchards. August 2022.

Forest Ecology and Entomology. Module written for honours course at Nelson Mandela University. July 2021.

Eland Ecology and Management. Report written for farm owners of Oude Bethlehem to give advice and management strategies for dealing with unchecked eland numbers. May 2018.

Oude Bethlehem Rehabilitation Implementation Plan. Detailed implementation strategy with dates, costs and man hours to eradicate alien invasive species on farm including regular monitoring strategies. March 2017.

Veld Rehabilitation Plan for Oude Bethlehem farm. Detailed report written for farm owners including information about vegetation history of farm, current state of invasion and alien management strategies to be implemented for Afromontane forest and fynbos rehabilitation. January 2017.

Edge effects in the Knysna Forest. Short description of my research on edge effects written for the South African National Survey of Arachnida newsletter. October 2015.

STUDENT SUPERVISION

Claude Lionel Schippers (BSc honours) 2023: "The effect of forest patch size and isolation on pollinator insect diversity". Status: completed.

Graham van Bergen (BSc honours) 2023: "Dung and carrion beetle diversity in relation to forest size and isolation". Status: completed.

Lizo Yezani (BSc honours) 2024: "Crown zone influence of veteran, emergent trees (*Afrocarpus falcatus*) on southern Afrotemperate forest tree communities". Status: completed.

Anneke Elliott (MSc) 2022-2024: "Investigation of the sudden dieback of *Gymnosphaera capensis* (forest tree fern) in southern Afrotemperate forests". Status: under revision.

Graham van Bergen (MSc) 2024-present: "Impact of flora, season and adjacent biome on anthophilous insects within the southern Cape fynbos". Status: ongoing.

LECTURING EXPERIENCE

Forest Restoration Research Group, Swedish University of Agricultural Sciences – presented a lecture on insect seed predation of indigenous forest trees in South Africa. October 2024.

Forest Ecology and Conservation Biology (subject), Swedish University of Agricultural Sciences – presented a lecture to third year students covering indigenous forest conservation in South Africa. September 2024.

Department of Wildlife, Fish and Environmental Studies, Swedish University of Agricultural Sciences – presented a four-day, four lecture seminar series "Southern Afrotemperate forest ecology" for the department as a visiting lecturer funded by Erasmus+ on the topics of indigenous tree pollination, insect diversity and distribution in the southern Cape forests, landscape ecology and fire effects on forest distribution and a history of forest utilisation and current management. September **-** October 2024.

Animal Studies (subject), Nelson Mandela University – lecturing invertebrate and vertebrate ecology for first year students at the Department of Natural Resource Management, including slide preparation, setting up assignments and tests, organising practicals and field excursions, planning semester activities and marking assignments and exams. January – December 2022; January – June 2024.

Conservation and Marine Sciences, Cape Peninsula University of Technology – presented a self-written module "Afrotemperate forest ecology and management" for 4th year resource management students over a whole day, including designing and marking an assignment on forest and fynbos rehabilitation. January 2024.

Seminar Series for Biological Sciences, University of Cape Town – presented the talk "Generalist forest canopy tree species have distinct pollinator communities partially predicted by floral traits" during a seminar series. October 2023.

School of Natural Resource Management, Nelson Mandela University – presented a self-written elective titled "Indigenous Forest Rehabilitation" at George Campus for honours level nature conservation students, including the design and marking of an assignment. August 2023.

School of Natural Resource Management, Nelson Mandela University – presented a lecture titled "Identifying Afrotemperate forest trees" at George Campus for second year nature conservation students. May 2023.

Conservation and Marine Sciences, Cape Peninsula University of Technology – presented a self-written module "Afrotemperate forest ecology and management" for 4th year resource management students, including designing and marking an assignment on forest and fynbos rehabilitation. January 2022.

School of Natural Resource Management, Nelson Mandela University – presented a lecture titled "Insect Diversity Conservation" as an online lecture for 4th year nature conservation students. June 2021.

School of Natural Resource Management, Nelson Mandela University – presented a self-written lecture titled "Indigenous Forest Ecology" at George Campus for 4th year nature conservation students. May 2021.

Institute for Plant Science and Microbiology, Hamburg University – presented the talk "A glimpse into southern Afrotemperate forest canopies" at the Department of Biology, Hamburg University. July 2018.

Biogeography and Landscape Ecology Research Group, Hamburg University – presented the talk "Driving factors behind tree-arthropod interactions" at the Department of Geography, Hamburg University. July 2018.

CONFERENCE PRESENTATIONS

Thirty Eighth meeting of the Scandinavian Association for Pollination Ecology – presented the talk "Insect pollinator diversity in relation to vertical strata and species of tree in southern African temperate forests" at Lofthus, Norway. October 2024.

Eighth Frugivore and Seed Dispersal Symposium – presented the talk "Insect pre-dispersal seed predation in a southern African temperate forest" at Ilhéus, Brazil. August 2024.

Twelfth International Pollination Symposium – presented the talk "Generalist forest canopy tree species have distinct pollinator communities partially predicted by floral traits" at Kirstenbosch Botanical Gardens. October 2023. Won best presentation award.

Entomological Society of Southern Africa – presented the talk "Generalist forest canopy tree species have distinct pollinator communities partially predicted by floral traits" at Stellenbosch University. July 2023.

Garden Route Interface and Networking Meeting (GRIN) – presented a talk "Pollinator corridors across the southern Cape" at Lake Pine Marina, Sedgefield. October 2022.

Fynbos Forum – presented the talk "Beetle diversity in southern Afrotemperate forest canopies – a global perspective" at the 43rd annual Fynbos Forum, held online. August 2021.

Fynbos Forum - presented the talk "Southern Afrotemperate forest canopies: a new frontier" at the 41st annual Fynbos Forum, Baardskeerdersbos. August 2019.

Entomological Society of Southern Africa – presented the talk "The effects of commercial forestry plantations and roads on southern Afrotemperate forest arthropod diversity" at Rhodes University. July 2015.

PUBLIC / OUTREACH TALKS

Chris Nissen Primary – presented a talk to the learners during arbour week highlighting the importance of planting indigenous trees for biodiversity conservation, followed by tree planting. September 2023.

Pacaltsdorp Primêre Skool – presented a talk to the learners during arbour week highlighting the importance of planting indigenous trees for biodiversity conservation, followed by tree planting. September 2023.

Outeniqua Naturalist Club – presented a talk “Pollinator diversity in Knysna Forest tree canopies” at Belvidere Manor. July 2023.

Wildlife and Environment Society of South Africa (WESSA) – presented a talk “Pollinator diversity in Knysna Forest tree canopies” at the George Botanical Gardens. April 2023.

Constantia Kloof Conservancy – presented a talk “Pollinator corridors across the southern Cape” at St Aidan’s Chapel, Wilderness. March 2023.

Postgraduate Student Meeting – presented a talk “Day and night-time visitors to Afrotemperate forest trees and why it is important” at Gourikwa Nature Reserve. January 2023.

Touw River Conservancy – presented a talk “Creating pollinator corridors across the southern Cape through multiple stakeholder input” at Fairy Knowe Hotel, Wilderness. September 2022.

Dendrological Society of South Africa – presented a talk “Southern Afrotemperate Forest Tree Pollination” at the George Botanical Gardens. July 2022.

Postgraduate Research Day – presented the talk “Novel frontiers in southern Afrotemperate forest canopies” online hosted by the Nelson Mandela University, George Campus. May 2021.

Scientific Services, SANParks – presented the talk “Southern Afrotemperate forest canopies: a new frontier” at the Garden Route Scientific Services, Knysna. January 2019.

Conservation Ecology Research Day – presented the talk “Southern Afrotemperate forest canopies: a new frontier” at Stellenbosch University. May 2019. Won best presentation award.

Oude Bethlehem Farm, Banhoek Valley - biodiversity information session presented to farm workers and owners giving feedback and progress on rehabilitation efforts. December 2018.

Brackenfell Nature Reserve – presented a talk “Planting indigenous trees helps conserve local insect diversity” to the friends of Brackenfell Nature Reserve, using my research to show the value of planting indigenous trees to conserve local insect diversity. May 2018.

Kirstenbosch Career Day – represented the Department of Conservation Ecology and Entomology, Stellenbosch University, by presenting my research to school pupils. February 2018.

Oude Bethlehem Farm, Banhoek Valley - biodiversity information session presented to farm workers concerning environmental education and –rehabilitation techniques. October 2017.

SCIENTIFIC PAPER REVIEWS

- For the journal Biodiversity, Taylor & Francis. August 2019.

- For the journal Biodiversity, Taylor & Francis. November 2019.
- For Biodiversitas Journal of Biological Diversity, January 2020.
- For the journal Biodiversity, Taylor & Francis, May 2020.
- For the journal Agricultural and Forest Entomology, Wiley Online, January 2021.
- For the journal Agricultural and Forest Entomology, Wiley Online, May 2021.
- For the journal Scientific Reports, Nature, December 2021.
- For the journal Scientific Reports, Nature, January 2022.
- For the journal Biodiversity, Taylor & Francis, April 2022.
- For the South African Journal of Botany, Elsevier, July 2022.
- For the journal Acta Oecologia, Elsevier, October 2023.
- For the journal Biodiversity, Taylor & Francis, January 2024.
- For the Journal of Biogeography, Wiley Online, January 2024.
- For African Entomology, Entomological Society of Southern Africa, April 2024.

SOCIETIES AND MEMBERSHIPS

- Registered Ecological Scientist with the South African Council for Natural Scientific Professions (SACNASP 137513)
- Member of the Dendrological Society of South Africa (Outeniqua branch)
- Member of George Municipality Tree Planting Advisory Committee
- Member of the British Ecological Society
- Member of the Entomological Society of Southern Africa

COMPUTER SKILLS

- R (Advanced – LMs, GLMs, GLMMs, Bipartite, Boral, model selection, multivariate analyses)
- Excel (Advanced)
- PRIMER
- QGIS

REFERENCES

- Prof. F Roets – Professor in Ecology – University of Stellenbosch   fr@sun.ac.za
- Prof. MJ Samways – Distinguished Professor in Entomology and Ecology - University of Stellenbosch   samways@sun.ac.za

- Dr. A Coetzee – Lecturer – Nelson Mandela University anina.coetzee@mandela.ac.za
- Dr. CJ Geldenhuys – Extraordinary Professor in Plant Science - University of Pretoria cgelden@mweb.co.za

SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Rudi Crispin Swart

Registration Number: 137513

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule 1 of the Act)

Ecological Science (Candidate Natural Scientist)

Effective **5 May 2021**

Expires **31 March 2025**

Chairperson

Chief Executive Officer

To verify this certificate scan this code