Portion 76/216 Uitzigt Farm Uitzigt in Brenton-on-Sea, Knysna, Western Cape

Terrestrial Animal Species Specialist Assessment:

Site Sensitivity Verification Report and Impact Assessment

Prepared For: EcoRoute
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Date: February 2024
Version: Final

DECLARATION OF SPECIALIST INDEPENDENCE

- I consider myself 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 I 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 in an objective manner. 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;
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Monica Leitner (MSc)

February 2024

SUMMARY OF EXPERIENCE AND ABRIDGED CV - MONICA LEITNER

Core skills

- MSc. Zoology (University of Pretoria) and 5 years of work experience (project management and field work) for ecological research projects aimed at invertebrate diversity, ecological functioning, and large mammal ecology.
- Extensive ecological and field work experience (before, during and after postgraduate degrees) across a range of environments (mesic to arid savanna, grasslands and mountain terrain, sub-Antarctic) and taxa (invertebrates, avifauna, amphibians, reptiles, small mammals and large mammals).
- Two overwintering years on Marion Island, with extensive field work as Environmental Conservation Officer and seabird monitor (2018-2019), and a marine mammal ecologist (2022-2023).

Work experience

- 2022-2023: Marine mammal field assistant on sub-Antarctic Marion Island (Marion Island Marine Mammal Programme, University of Pretoria)
- 2016-2018; 2019-2022: Project Coordinator (University of Pretoria) for international Soil Fauna in Africa consortium (funded by the United Kingdom's Royal Society and Department for International Development).
- 2019-2022: Research assistant for Marion Island Marine Mammal Programme (University of Pretoria).
- 2018-2019: Environmental Conservation Officer on sub-Antarctic Marion Island (Department of Environmental Affairs).
- 2016-2018: Research assistant for Sani Pass (Drakensburg) long term invertebrate and ecosystem monitoring project (Centre for Invasion Biology, University of Pretoria).

Qualifications

- BSc. Environmental Sciences (2011, University of Pretoria)
- BSc. Honours Zoology (with distinction, 2012, University of Pretoria)
- MSc. Zoology (with distinction, 2015, University of Pretoria)

Publications

- Trisos MO, Parr CL, Davies AB, Leitner M & February EC. 2021. Mammalian herbivore movement into drought refugia has cascading effects on savanna insect communities. Journal of Animal Ecology, https://doi.org/10.1111/1365-2656.13494
- Leitner M, Davies AB, Robertson MP, Parr CL & Van Rensburg BJ. 2020. Termite mounds create heterogeneity in invertebrate communities across a savanna rainfall gradient. Biodiversity and Conservation, 29(4), pp.1427-1441

- Leitner M, Davies AB, Parr CL, Eggleton P & Robertson MP. 2018. Woody encroachment slows decomposition and termite activity in an African savanna. Global change biology, 24(6), pp.2597-2606

SACNASP Registration - Professional Natural Scientist (Ecological Sciences), 166055.

References

- Dr. Michelle Thompson – Former colleague on Marion Island and University of Pretoria
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ABBREVIATIONS AND ACCRONYMS

CBA	Critical Biodiversity Area
CD:NGI	Chief Directorate: National Geo-spatial Information
DFFE	Department of Forestry, Fisheries, and the Environment
ESA	Ecological Support Area
EWT	Endangered Wildlife Trust
NEMA	National Environmental Management Act
SANBI	South African National Biodiversity Institute
SCC	Species of Conservation Concern
SDP	Site Development Plan
SSVR	Site Sensitivity Verification Report
WCBSP	Western Cape Biodiversity Spatial Plan

1. INTRODUCTION

Confluent Environmental Pty (Ltd) was appointed by EcoRoute to provide Terrestrial Animal Specialist inputs for the proposed development of two dwellings on Portion 76/216 Uitzigt Farm in Brenton on Sea, Knysna, Western Cape.

1.1 General Site Location

Portion 76 / 216 Uitzigt Farm is ca. 21 hectares in extent and located west of Brenton on Sea and south of the Knysna lagoon and estuary. The property is currently completely undeveloped and situated within a largely natural area (minimal to no development on neighbouring properties) including a coastline just outside its southern boundary (Figure 1). The site is currently only accessible via the road on the western neighbouring property, which splits off from the main road to Brenton on Sea (C.R. Swart Drive) in the north. The property falls within the larger Garden Route Biosphere Reserve and Knysna National Lake Area protected areas. Other protected areas within approximately 5km of the site include Skuilte Private Nature Reserve, Featherbed Private Nature Reserve, Pledge Nature Reserve and the large coastal area west of the site forming the Goukamma Nature Reserve and its associated Marine Protected Area.

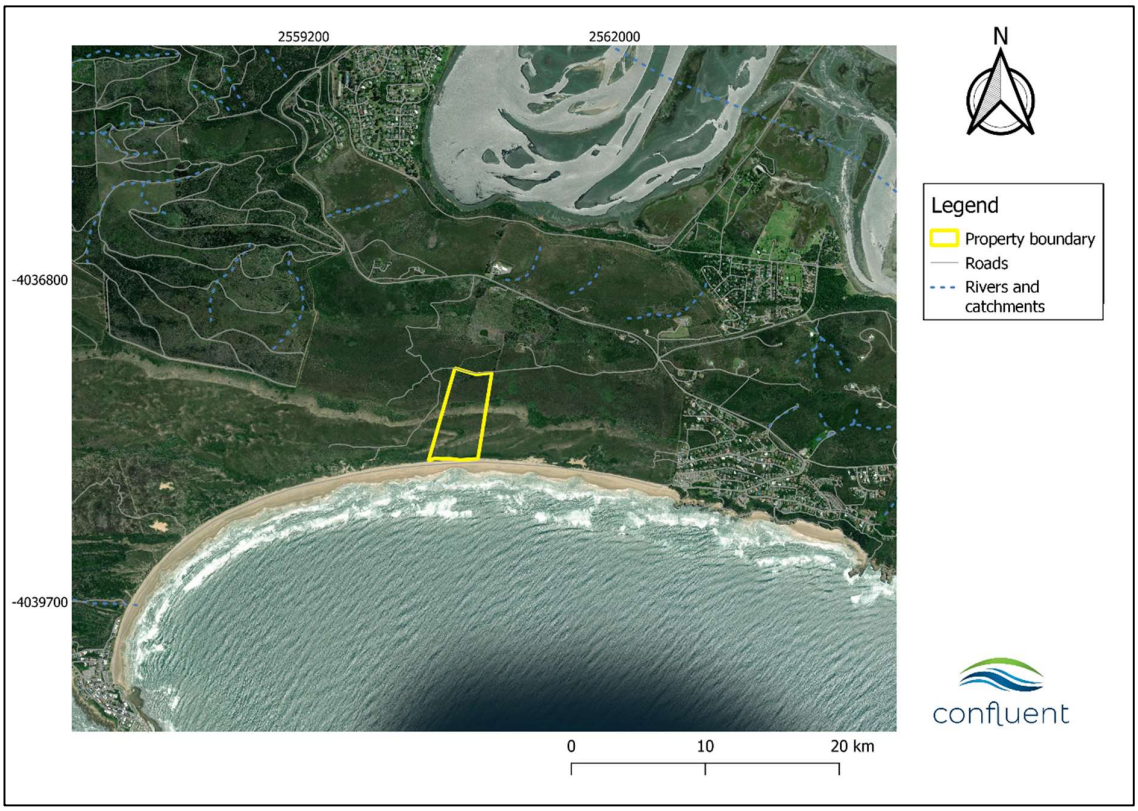

Figure 1. Portion 76/216 Uitzigt Farm in Knysna, Western Cape and the roads, Knysna lagoon and estuary, and catchments in the greater landscape.

1.2 Development Layout

At the time of writing this report three SDPs were suggested (Figure 2):

- Alternative 1: The southern section is accessed via an entirely new road running from the north and winding through the middle of the property ca. 850 m in length. The northern property is abandoned.
- Alternative 2 (preferred SDP): The southern dwelling is accessed via the existing paved road on the western neighbour's property (Portion 39/216 Uitzigt Farm) with a new short direct access road (approx. 290 m in length, half of which will be on the neighbouring property) branching off towards the main dwelling.
- Alternative 3: The southern dwelling is accessed via an entirely new road running from the northern dwelling, winding through the middle of the property and ca. 850 m in length.

The estimated development footprints for the dwellings and roads as per the current plans:

1. Alternative 1: the proposed new access road across the middle of the site is ca. 850 m and covers ca. 2500 m^2, assuming a 3m wide road. The only dwelling has a footprint of ca. 3000 m^2.
2. Alternative 2: the proposed new access road stemming from the existing paved road on the neighbouring property is ca. 290 m long and covers ca. 870 m^2, assuming a 3 m wide road. The dwelling in the south of the site has a footprint of ca. 3000 m^2.
3. Alternative 3: the proposed new access road across the middle of the site is ca. 850 m and covers ca. 2500 m^2, assuming a 3m wide road. The northern secondary dwelling has a footprint of ca. 680 m^2. The main dwelling in the south of the site has a footprint of ca. 1340 m^2.

The total footprints for the proposed development options on the property will therefore amount to:

1. SDP Alternative 1: ca. 5500 m^2, translating to ca. 2.6% of the area of the property.
2. SDP Alternative 2 (preferred): ca. 3870 m^2, translating to ca. 1.8% of the area of the property.
3. SDP Alternative 3: 4520 m^2, translating to ca. 2.2% of the area of the property.

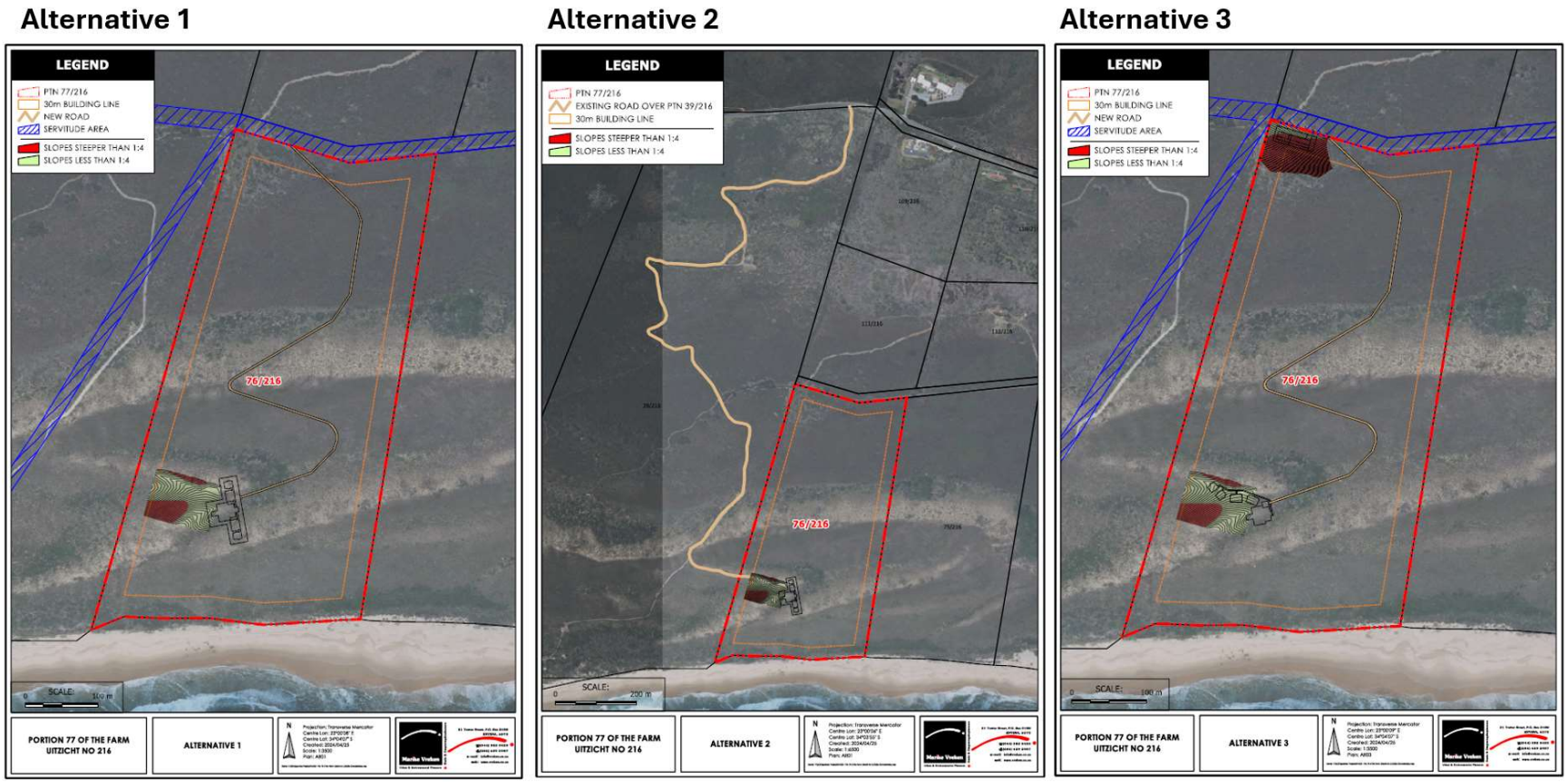

Figure 2. Maps of SDP Alternatives 1, 2, and 3 for Portion 76/216 Uitzigt Farm showing dwellings and proposed road options for accessing the building(s).

2. TERMS OF REFERENCE

2.1 Online Screening Tool

The scope of work for this report is guided by the legislative requirements of the National Environmental Management Act (NEMA; Act 107 of 1998).

The Department of Forestry, Fisheries and the Environment (DFFE) Screening Tool determined a HIGH and MEDIUM sensitivity for the terrestrial animal species theme across Portion 76/216 Uitzigt Farm (Figure 3), with several animal Species of Conservation Concern (SCC) potentially present (Table 1).

As per Published Government Notice No. 1150 of the Government Gazette 43855 (30 October 2020):

A **HIGH** sensitivity rating indicates:

1. Confirmed habitat for SCC.

2. SCC, listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable, according to the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare.

These areas are unsuitable for development due to a very likely impact on SCC.

A **MEDIUM** sensitivity rating indicates:

1. Suspected habitat for SCC based either on historical records (prior to 2002) or being a natural area included in a habitat suitability model for this species.

2. SCC listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare.

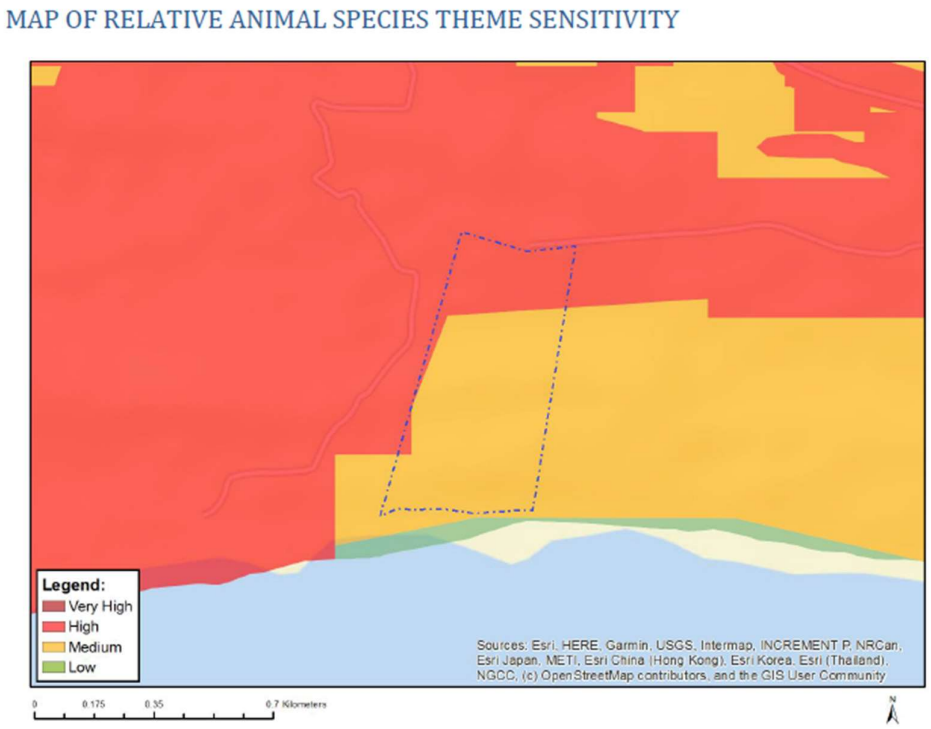

Figure 3. DFFE Online Screening Tool outcome for the terrestrial animal species theme for Portion 76/216 Uitzigt Farm. The property boundary is indicated by the blue dashed line.

Table 1. Species of Conservation Concern highlighted by the DFFE Online Screening Tool for Portion 76/216 Uitzigt Farm.

Sensitivity	Classification	Scientific name	Common name	Red list status*
High	Avifauna	*Circus ranivorus*	Marsh Harrier	Endangered
High	Avifauna	*Circus maurus*	Black Harrier	Endangered
High	Avifauna	*Stephanoaetus coronatus*	Crowned Eagle	Vulnerable
High	Avifauna	*Bradypterus sylvaticus*	Knysna Warbler	Vulnerable
High	Avifauna	*Polemaetus bellicosus*	Martial Eagle	Endangered
Medium	Amphibian	*Afrixalus knysnae*	Knysna Leaf-folding Frog	Endangered
Medium	Mammal	*Chlorotalpa duthieae*	Duthie's Golden Mole	Vulnerable
Medium	Mammal	*Sensitive species 8*	-	Vulnerable
Medium	Invertebrate	*Aneuryphymus montanus*	Yellow-winged Agile Grasshopper	Vulnerable
Medium	Invertebrate	*Aloeides thyra orientis*	Red Copper Butterfly	Endangered
Medium	Invertebrate	*Procydrela precursor*	Ground-dwelling spider sp.	Endangered

* Red list status as per SANBI's Red List of South African Species http://speciesstatus.sanbi.org except *P. precursor* which is listed as endangered in the Checklist of the Spiders (Araneae) of South Africa (Dippenaar-Schoeman, et al. 2023).

2.2 Scope of work

The purpose of this report is to verify the site sensitivity of Portion 76/216 Uitzigt Farm for the terrestrial animal species theme in accordance with the protocols specified in the Published Government Notice No. 1150, Government Gazette 43855 (30 October 2020).

The site sensitivity verification includes:

- A desktop assessment, to:
    - Characterize the vegetation, climate, general habitat features and topography of the property.
    - Assess the property's location within the context of the Western Cape Biodiversity Spatial Plan (WCBSP).
    - Conduct a historical assessment of the property and immediate surroundings for any disturbances, development and changes in land use or habitat characteristics over time.
    - Provide information on the habitat requirements for Species of Conservation concern highlighted by the DFFE online screening tool, in addition to other SCC indicated through online resources (e.g. Virtual Museum, iNaturalist) for the property and surrounding areas.
- On-site inspection(s) and field assessments to:
    - Verify the current land use and identify current impacts or disturbances on the property.
    - Characterize faunal habitats, determine the habitat suitability and the likelihood of SCC occurring on the property.
    - Conduct taxa-specific sampling for SCC in suitable habitats.
- Any other available and relevant information from
    - Discussions with landowners/neighbours.
    - Previous report findings for the property or surrounding areas.

Should the site sensitivity verification indicate a **LOW** sensitivity, then a Terrestrial Animal Species Compliance Statement will be issued.

Should the site sensitivity verification indicate a **HIGH** sensitivity, then a Terrestrial Animal Species Specialist Assessment will be compiled.

3. DESKTOP ASSESSMENT

3.1 Vegetation, Climate and General Habitat

Brenton on Sea near Knysna, Western Cape falls within the Fynbos biome and experiences a temperate climate year-round (Mucina and Rutherford 2006, Rebelo, *et al.* 2006). The mapped vegetation type at the site includes Knysna Sand Fynbos (FFd 10; Critically Endangered) and Goukamma Dune Thicket (AT36; Least Concern) - a detailed botanical specialist assessment is available (B. Fouche, Confluent Environmental). Average temperatures range between 28℃ and 8℃, with the hottest days experienced from December to March peaking around 38℃ and the coldest days experienced from June-August not falling below 1℃. Rain occurs throughout the year in a bimodal pattern with peaks in autumn (April) and spring (October-November) (Figure 4).

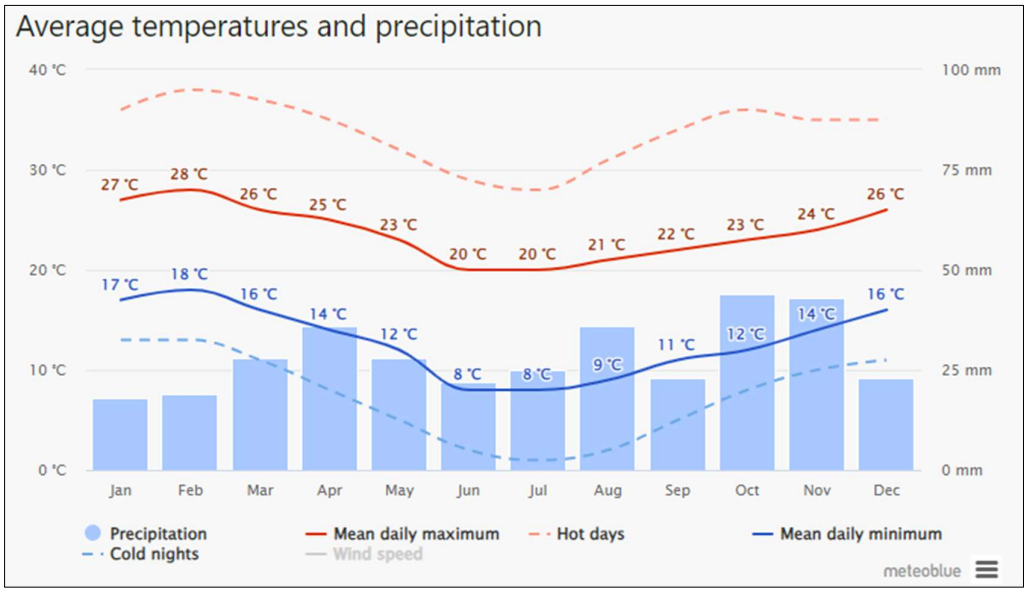

Figure 4. Summary of historical climate (modelled) for Brenton on Sea (www.meteoblue.com).

Satellite imagery from Google Earth and Cape Farm Mapper was used to assess general vegetation structure, elevational gradients and water bodies within the project area (Figure 5). The site mainly comprises of fynbos vegetation, except for the sparsely vegetated crests of dunes in the middle and southern sections, and a few dense stands of alien trees/shrubs in the north-western corner and base of dunes in the central and southern regions. Elevation is

highest in the north and the site slopes southerly towards to a pronounced valley/dune feature in the middle of the property, followed by vegetated hind and foredunes towards the coast in the south. A mapping layer was also applied to the site to assess for wetlands and watercourses (NWM5), but this revealed that none were present on the property (Figure 5).

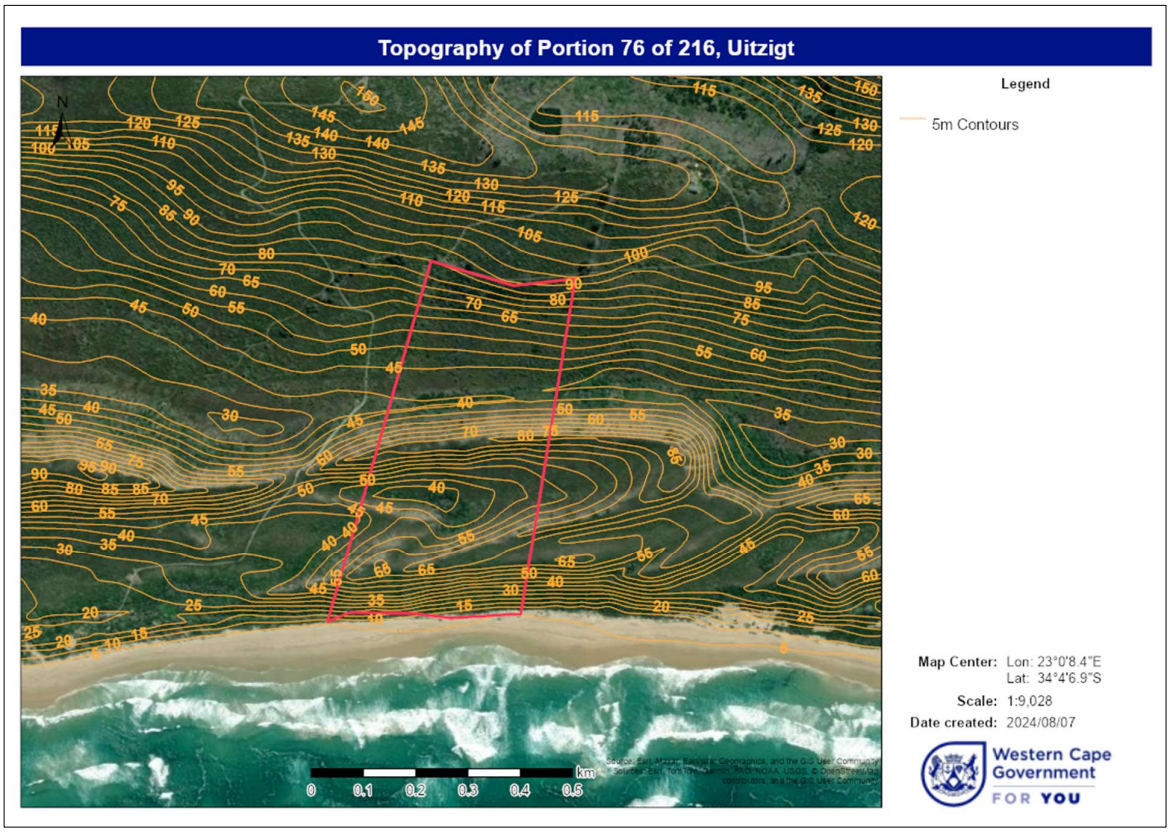

Figure 5. Satellite imagery of Portion 76/216 Uitzigt Farm outlined in red showing topography (5m contours). There are no mapped watercourses present on the site (NWM5). Source: Cape Farm Mapper.

3.2 Western Cape Biodiversity Spatial Plan

Additional mapping layers were applied to Portion 76/216 Uitzigt Farm to include the Western Cape Biodiversity Spatial Plan (CapeNature 2017), with Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) assessed in Figure 6 and Table 2. The entire property falls within a large CBA1 zone, which also extensively covers all neighbouring properties, particularly in the east and west of the site (Figure 6). The reason for this CBA1 assignment is due to the site containing key vegetation and aquatic zones flagged for protection:

- Coastal Resource Protection – Eden, Foredune, & Coastal Habitat Type
- Critically Endangered (CR) Knysna Sand Fynbos

- Critically Endangered (CR) Rondevlei Sandplain Fynbos (Vlok variant).
- Vulnerable (VU) Southern Cape Dune Fynbos
- Water source protection- Knysna & Watercourse protection - South Eastern Coastal Belt.

See also the Botanical Specialist Report by B. Fouche (Confluent Environmental) and Aquatic Specialist Report by J. Dabrowski (Confluent Environmental) for additional information on these mapped layers.

The site itself does not contain any ESA layers, however, small portions of the road to the west of the site have been mapped as ESA2 (Figure 6).

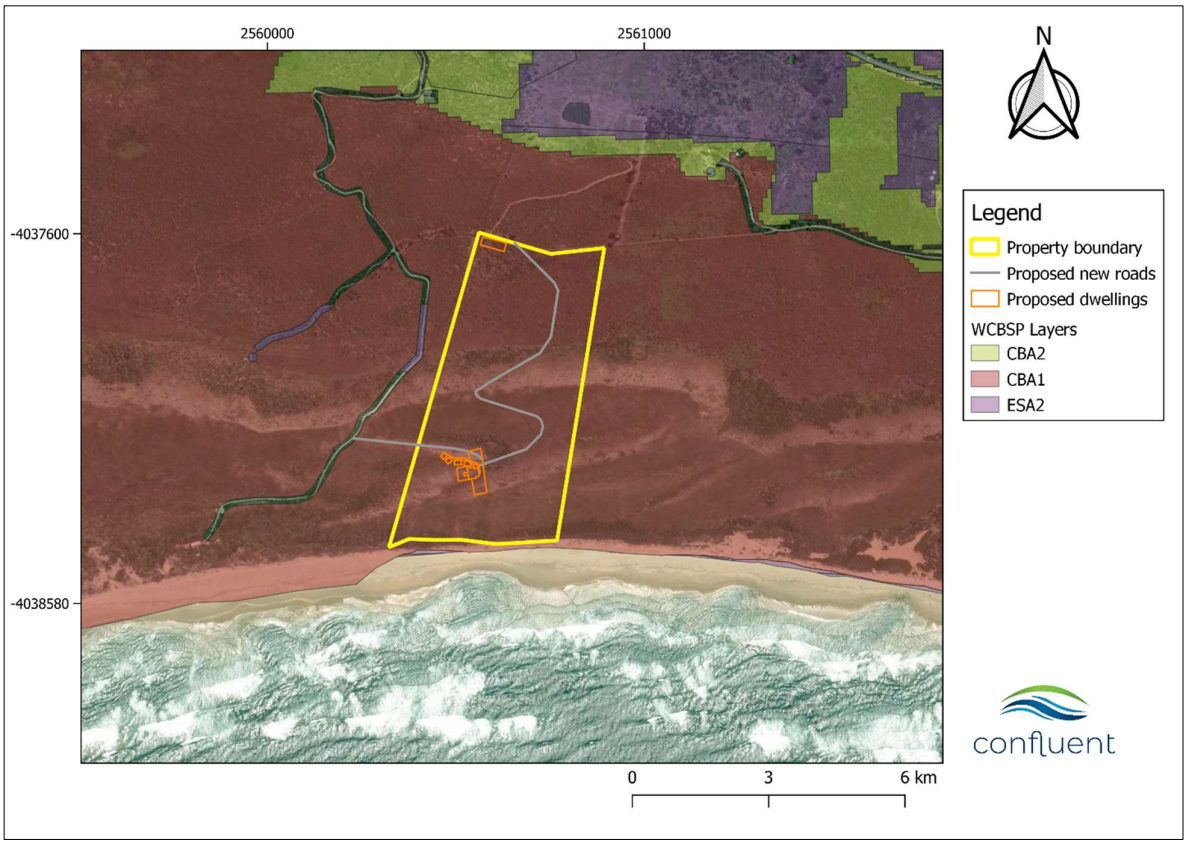

Figure 6. Site map of Portion 76/216 Uitzigt Farm with layers for the Western Cape Biodiversity Spatial Plan's Critical Biodiversity Areas (CBA1) and Ecological Support Areas (ESA2).

Table 2. Definitions and objectives for conservation categories identified in the Western Cape Biodiversity Spatial Plan (CapeNature 2017) .

WCBSP Category	Definition	Management Objective
Critical Biodiversity Area 1 (CBA1)	Areas in a natural condition. Required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure.	Maintain in a natural or near-natural state, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate.
Critical Biodiversity Area 2 (CBA2)	Areas in a degraded or secondary condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure.	Maintain in a natural or near-natural state, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land-uses are appropriate.
Ecological Support Area 2 (ESA 2)	Areas severely degraded or have no natural cover and ecological functioning severely impaired. Not essential for meeting biodiversity targets but support ecological functioning and delivering ecosystem services.	Restoration required to return ecological functioning. Some limited habitat loss may be acceptable. A greater range of land uses over wider areas is appropriate but ensures the underlying biodiversity objectives and ecological functioning are not compromised.

3.3 Historical Assessment of Project Area

Portion 76/216 Uitzigt Farm has experienced little disturbance and no development over the last 88 years (Figure 7). The most notable change over time is general vegetation thickening, with the majority of the property being sparsely vegetation in 1936 and generally more densely vegetated, with a reduction in the extent of open/bare soils, in recent years.

In 1936, minimal disturbance is seen on the property however there is some woody vegetation (Rooikrans (*A. cyclops*)) on the north-facing dune slope in the middle of the property. Similar patches of *A. cyclops* are also observed in the same dune valley on the eastern and western neighbouring properties. The northern section of the property is well vegetated with fynbos, while the rest of the property to the south is sparsely vegetated and with a lot of bare soil observed.

By 1958 little to no change was observed on the property. The *A. cyclops* patches are still visible in the middle of the site and neighbouring properties, with some thickening and expansion observed.

In 1973 new roads are seen to the north and east, but no development occurred on property itself. Vegetation thickening and increasing plant cover is observed throughout the site. The *A. cyclops* stand in the middle of the site has increased in cover and now almost joins up with similar stands in the dune valley on neighbouring properties.

By 1998 another stand of alien trees appears in the north-western corner of the property, and woody thickening continues in the middle of the site with the *A. cyclops* stands. Little to no other changes are observed.

By 2014 the invaded north-western corner of the property has expanded and is notably denser. There are now also some alien trees scattered throughout the area north of the property. The *A. cyclops* in the middle of the property now forms a continuous stand throughout the dune valley across neighbouring properties to the east and west.

The 2018 imagery shows that the southern two-thirds of the property was extensively burnt by the 2017 Knysna fires (May-June 2017), with some vegetation having recovered but the fire path still clearly visible over the landscape.

By 2019 the vegetation in the south had mostly recovered from the 2017 fire, including the *A. cyclops* stands in the middle of the property. The alien trees in the northwest of the property have recently been cleared with bare soil visible now.

In 2023 vegetation thickening is observed throughout the property with less bare soil visible overall. The cleared alien vegetation in the northwest has revegetated, with no bare soil remaining and many shrubs/trees present again. The *A. cyclops* stands in the middle of the site have also become denser, with thickening and spread observed across the dune valley and joining up again with those on neighbouring properties.

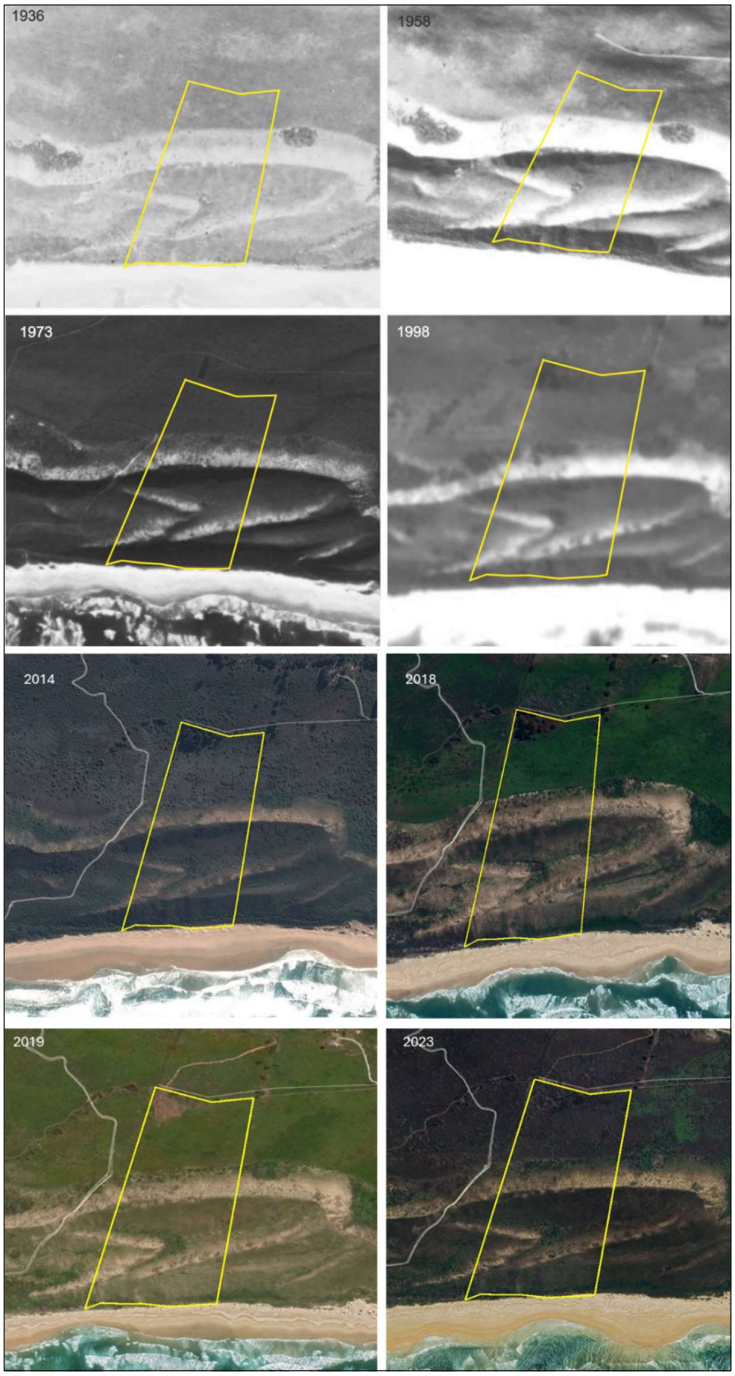

Figure 7. Historical imagery of Portion 76/216 Uitzigt Farm sourced from the CD: NGI geospatial portal and Google Earth. The property boundary is indicated by the yellow line.

3.4 Species of Conservation Concern

In addition to the SCC highlighted by the DFFE screening tool (Table 1), the following public resources were consulted to provide additional SCC for Portion 76/216 Uitzigt Farm and its immediate surroundings:

1. iNaturalist (all taxa) within 5 km x 2 km of the project area (URL for iNaturalist search area).
2. Virtual Museum for herpetofauna, mammals and invertebrate taxa within the Quarter Degree Squares (QDS) 3422BB and 3423AA (as the site is right on the border of the two QDS): DungBeetleMAP, FrogMAP, LacewingMAP, LepiMAP, MammalMAP, OdonataMAP, ReptileMAP, ScorpionMAP, SpiderMAP.
3. South African Bird Atlas Project (SABAP2) for pentad 3400_2300 and 3400_2255 (as the site is right on the border of the two pentads).

Some SCC reported on the platforms were highly unlikely to occur the site given either clearly unsuitable habitat or being deemed a vagrant/transient animal. For example, given that the property does not contain any waterbodies, all animals reliant on such habitat features for their existence are highly unlikely to occur on site. For the purposes of this report these animals were excluded from further assessment (see also Section 4.2 and Appendix 1 for additional information).

The combined list of SCC (from DFFE Screening Tool and public resources) possibly occurring on Portion 76/216 Uitzigt Farm, along with their habitat, breeding and feeding requirements are listed in Table 3. The information for each SCC presented in Table 3 stems largely from the online SANBI Red List of South African Species (http://speciesstatus.sanbi.org) in addition to a few key resources for each taxa:

4. Avifauna: Roberts Birds of Southern Africa VII (Roberts, et al. 2005)
5. Mammals: The Mammals of the Southern African Subregion (Skinner 2005)
6. Invertebrates:
    - Field guide to the insects of South Africa (Picker, Griffiths and Weaving 2019)
    - Field guide to the butterflies of South Africa (Woodhall 2005)
    - Field guide to the spiders of South Africa (Dippenaar-Schoeman 2023)
7. Amphibians: A complete guide to the frogs of Southern Africa (Du Preez and Carruthers 2015)
8. Reptiles: A guide to the reptiles of Southern Africa (Alexander 2013)

Any information presented from different sources is cited in the text.

Table 3. Summary of habitat, breeding and feeding requirements for animal SCC potentially occurring on Portion 76/216 Uitzigt Farm.

Species	Red list status	Habitat	Breeding	Feeding
AVIFAUNA				
Circus maurus Black harrier[1]	Endangered	-In Western Cape, mostly found in Fynbos, especially montane Fynbos and strandveld. Less common in dry restios and renosterveld. Elsewhere, occurs in dry grassland, Karoo scrub, crop fields (wheat) and grasslands (sometime >3000m elevation). -Many move from Fynbos to Karoo and grasslands during the winter, likely to follow rodent numbers (e.g. capitalise on late summer litter of Sloggett's ice rats in Free State and Lesotho). -Birds move away following fires and don't return for several years.	-Mainly monogamous but some polygamy observed. Mate fidelity is low. -Usually solitary nester and territorial, but in Western Cape some semi-colonial nesting observed with less territorial behaviour. -Nest is a small structure of grass, stems and small twigs. Usually on or just above ground, in rank marsh grasses or near Fynbos bushes and sedges (*Juncus* spp.). -Nests most often in marshes or next to small streams, but also on damp soil or dry ground. Nest areas reused in successive years	-Specialist predator of mice and birds. Predominantly rodents (vlei rats, mice) eaten by birds in Fynbos areas and small birds (Common Quail) dominate diet of birds in mountain areas. Also takes reptiles, frogs, insects too lesser extent. -Sometimes caches prey. -Forages most actively on blustery days (windy and rainy), hovers 1-3m above vegetation with buoyant flight. -Flashes into vegetation, hits prey hard and eats on ground. Perch hunting rare.

[1] SCC identified by DFFE Screening Tool

Species	Red list status	Habitat	Breeding	Feeding
			(one observation of nest site used for 26 years). -Egg-laying is from June – November.	
Circus ranivorus Marsh Harrier[1]	Endangered	-Considered a waterbird. -Roosts on taller trees around wetland edges from where it has a good vantage point. -Can adapt to novel wetland habitats such as wastewater treatment works	-Breeding occurs between September and December. -Egg-laying is from August to November in South Africa. -Nests made of grass, reed stems or sticks in reedbeds, short sedge areas or in trees along the water's edge. - The same nest is often reused by the same pair in following years.	-Dietary assessment (Simmons *et al.*, 1991) of pellets and prey deliveries to nests includes birds, fro gs, fish, eggs and micromammals (*Rhabdomys, Otomys*, and Shrews). -Hunts primarily in wetland habitats using various flight methods including soaring, hovering and low flight over wetlands and along the water's edge. - May hunt in open grasslands or pastures near wetland areas.
Polemaetus bellicosus Martial Eagle[1]	Endangered TOPS: Endangered (2023 DRAFT) CITES: Appendix II	-Savanna, Karoo shrubland, semi desert. -Can occur in open farmland with clumps of trees. -Rare in mountainous and forest areas.	-Monogamous, pair bond lasts several seasons. Solitary nester. -Nest is a substantial platform of sticks (up to 1.5m long and 3cm thick) on tall trees or pylons. -Nest tree usually tallest in vicinity, and nest placed in a large fork below the canopy. Rarely uses rocky outcrops.	- Mainly small mammals like hare, jackal, small antelope, mongoose, small baboons, but also small stock animals, birds (especially gamebirds) and reptiles (especially monitor lizards). - Usually hunts on the wing by soaring high and attacking in long slanting stoop. Surprises prey by using available cover.

Species	Red list status	Habitat	Breeding	Feeding
			-One egg is laid, with incubation 48-53 days predominantly by female bird.	Occasionally hunts from perch, especially at waterholes or along game trails. - Prey killed by impact or strangulation and taken to high perch to eat.
Bradypterus sylvaticus Knysna warbler[1]	Vulnerable	-Inhabits dense understorey vegetation along riverbanks in fynbos forest patches, riverine woodland and afromontane forest and has even adapted to thickets of non-native brambles (e.g. *Rubus* sp.). (BirdLife International, 2016).	-Breeds from August and December coinciding with the greatest abundance of invertebrate species. (BirdLife International, 2016).	-Mostly on ground, creeping through dense, matted vegetation and scratches in humus - Eats mostly grasshoppers, insect larvae, spiders, slugs, worms.
Falco biarmicus Lanner Falcon[2]	Vulnerable	- Most frequently in open grassland or cleared woodlands and agricultural lands. -Breeding pairs favour habitat close to cliffs, but will also be found near alternative roosting sites like	-Monogamous, long-term pair bond, territorial. -Nest is typically a simple scrape on cliffs, buildings or bird boxes, but will occasionally use stick nests from other species (including	- Hunts from high perch or from air, using speed to surprise and catch prey but also adept at using cover. - Prey taken in air and on ground. - Pairs can hunt cooperatively.

[2] SCC identified by SABAP2 pentads 3400_2300 and 3400_2255

Species	Red list status	Habitat	Breeding	Feeding
		electricity pylons, buildings, large trees.	White-necked raven, Verreaux's eagle, Bateleur) in trees or electricity pylons.	- Prey mostly birds (>80%) but will also take reptiles and insects.
Stephanoaetus coronatus Crowned eagle[1]	Vulnerable	-Forest (including gallery forest), dense woodlands and forested gorges in savannas and grasslands. -Also in *Eucalyptus* and Pine plantations. -Perches for long periods, resting in canopy. Sometimes soars high over territory, then descends vertically to perch. -Manoeuvres agilely through thick forest, can take off vertically from forest floor.	-Monogamous, possibly long-term pair bond. -Territorial (at least 10 km^2), solitary nester. -Tallest trees used to build large stick platform nest (sticks/branches up to 1.5m long, 3cm thick). Nest copiously lined with beachwood (*Faurea saligna*), Pine or *Eucalyptus* leaves/needles. -Nest often reused and added to in consecutive years, can reach up 2-3m diameter, 3m high. -Nest trees often at the base of cliff/ravine or at the edge of plantation. Nest trees usually White-stinkwood (*Celtis africana*), yellowwoods (*Podocarpus* spp.), Cabbage tree (*Cussonia spicata*)	-Predominantly feeds on mammals (96% diet) and mostly on hyrax, antelope and primates. Will also take porcupine, hares, mongoose, sometimes domestic stock and domestic cats/dogs. Avian prey includes Hadada Ibis, Egyptian geese and domestic chickens. Reptile prey mainly monitor lizards. -Most prey taken on ground, but occasionally crashes into dense foliage in pursuit. -Frequently still-hunts (stalks prey) and hunts from concealed perches frequently above waterholes in evening waiting for antelope to drink. -Pair sometimes hunt monkeys cooperatively. -Prey struck with downward blow of open foot, massive hind claw penetrates the skull killing instantly.

Species	Red list status	Habitat	Breeding	Feeding
			but also *Eucalytus* and Pine species. -Incubation 49-51 days.	-Large prey that cannot be lifted are partly eaten and dismembered on the ground and then cached in trees.
Anthropoides paradiseus Blue Crane[2]	Near Threatened TOPS: Protected (2023 DRAFT) CITES: Appendix II	-Open grassland, grassland/Karoo, wetlands. -Habitats with >300mm per year annual rainfall. -Adapted to crop lands and pastures and tolerant of intense grazing or burnt grasslands.	-Monogamous, solitary nester. -Nests on wet ground (on a pad of vegetation) or dry ground (small layer of stones, dung, vegetation) -Often reuses same nesting site for several years	-Pecking and digging with bill. -Omnivorous, feeds on small bulbs, seeds, roots, insects, crabs, amphibians, fish and small mammals. -Eats crops (maize, lucerne, wheat) and sometimes noted as causing damage, but also eats insect pests. -Commonly feeds at small stock feedlots.
Campethera notata Knysna Woodpecker[2]	Near Threatened	-Territorial, occurring in thornveld, Euphorbia thickets, riparian and montane evergreen forests. -Marginal occurrence in Protea communities, coastal white Milkwood (*Sideroxylon inerme*) thickets and alien trees.	-Monogamous, solitary nester. -Hole in trunk/branch of tree, usually in a dead stem 1.2-6m off the ground. -Holes infrequently reused in successive years, but a new hole can be excavated in the same branch. -Laying from August-November.	-Forages at all levels of trees, especially mid-canopy - Pecks and probes for ants and termites on dead branches, but occasionally forages on ground.

Species	Red list status	Habitat	Breeding	Feeding
Buteo trizonatus Forest Buzzard[3]	Least Concern (Regional), Near Threatened (Global)	-Afromontane forests and plantations (mainly Pine, but also *Eucalyptus*). -Generally unobtrusive, perching on large branches partially concealed under canopy, sometimes perching in open at the edge of forest edge.	-Monogamous, territorial, solitary nester. -Nest is platform of sticks, cup-lined with green leaves. Nests in plantations are smaller than in native forests. -Laying dates from August-November. -Breeding is confined to the Western Cape and Eastern Cape Provinces.	-Forages along forest edges and within (also plantations). Hunts mainly from perch. -Diet consists of small mammals (mice and moles), small birds, snakes, lizards, frogs and invertebrates.
MAMMALS				
Chlorotalpa duthieae Duthie's Golden Mole[1]	Vulnerable	-Occurs on alluvial sands and sandy loams in southern Cape Afrotemperate forests -Preference for forest vegetation over fynbos. -Narrow coastal band 275 km long between Wilderness and Port	- Little is known but a female was recorded with a litter of two young in November.	-Shallow subsurface foraging tunnels radiate outwards from beneath the roots of trees. - Forages at night in tunnels and through the leaf litter. - Diet includes earthworms.

[3] SCC identified within iNaturalist search area

Species	Red list status	Habitat	Breeding	Feeding
		Elizabeth with fairly disjunct populations. -Can occur in gardens and pastures adjoining forests. -Mainly active at night.		
Panthera pardus Leopard[4]	Vulnerable	-Wide habitat tolerance, but generally associated with rocky outcrops, hills, mountains and forests. -Manage to persist in areas of development provided there is adjacent cover of rocky hills or forest.	-Solitary animals with males and females holding territories and defend against same sex. -No specific breeding season but has been found to peak in unison with some ungulate prey species births in certain regions (i.e. impala in Kruger National Park). -Oestrous lasts 7 days during which male and female copulate frequently. -Gestation 106 days and cubs remain with mother for 12months after which siblings remain together for a further 2-3 months.	-Nocturnal, solitary hunter. -Small to medium animals, usually ungulates < 70kg (Impala, Klipspringer, Grey Rhebuck, Cape Grysbok, Duiker) but also take Baboons, Hyrax, hares, rodents, reptile, livestock or domestic cats/dogs. -Usually drags larger prey items into cover (dense shrubs) or up trees.

[4] SCC identified by Virtual Museum for QDS 3422BB and 3423AA

Species	Red list status	Habitat	Breeding	Feeding
Sensitive Species 8[1]	Vulnerable	-Specialised habitat requirements within a home range of approximately 0.75 ha. - Strong habitat preference for dense vegetation with good undergrowth providing good cover in which to retreat. -Forest, thicket, dense coastal bush, independent of water. -Can inhabit forest edges and transitional zones. -Requires diverse plant community with variety of tree and shrub species. -Can adapt to fragmented habitat given sufficient cover and food availability. -Actively avoids open grasslands, and areas with human disturbance.	-Breeds throughout the year. -Males establish territories and exhibit aggressive behaviours towards other males and to attract females.	- Highly selective feeders, often feeding on food below troops of monkeys or frugivorous birds which drop lots of material. - Preference for fruit, but also fallen leaves, flowers and insects. Seldom actively browse. -Active in the early morning and late afternoon, foraging for around 8 hours a day within their territory.
Amblysomus corriae Fynbos Golden Mole[4]	Near Threatened	-Sandy soils and soft loams in Mountain Fynbos, Grassy Fynbos and Renosterveld of South West Cape. Also Afromontane forest and southern African moist savanna along the southern Cape coast.	-Probably breeds aseasonally because pregnant females have been captured in August, May, and December. -Mean litter size is two; young are altricial and hairless at birth	-Insectivorous, mainly feeding on earthworms and insects.

Species	Red list status	Habitat	Breeding	Feeding
		-Favours richer and wetter soils preferring forest fringes and associated fynbos. -Thrives in gardens, cultivated lands, golf courses and livestock paddocks. Can be present in exotic plantations, but at lower densities.		
Leptailurus serval Serval[4]	Near Threatened TOPS: Protected (2023 DRAFT) CITES: Appendix II	-Widespread throughout sub-Saharan Africa. Mostly found in and around marshland, well-watered savannah and long-grass environments. Particularly associated with reedbeds and other riparian vegetation types. Proximity to water seems essential. -Habitats can be natural or man-made habitat (Child *et al.* 2016). - Adaptable to agricultural and industrial areas where appropriate wetland habitat is conserved, or waterbodies created in combination with an abundance of prey (Child *et al.* 2016). -Predominantly nocturnal.	-Gestation estimated 73 days. Pregnant females found between November-March, with young usually born early-mid warm/wet season. Young seen with females between July-October.	-Feeds mainly on small mammals (preference for rodents) but also birds, reptiles and frogs occasionally. Preference shown for vlei rats. -Usually solitary hunters, but pairs and young families are occasionally reported to hunt together.

Species	Red list status	Habitat	Breeding	Feeding
		-Previously extinct in Eastern and Western Cape province but reintroduced in EC and range expansions evident into WC, although rare.		
Poecilogale albinucha African Striped Weasel[4]	Near Threatened	-Rare in range and easily overlooked. -Predominantly nocturnal and well adapted to subterranean lifestyle. -Most abundant in savanna and grasslands, particularly with rainfall > 600mm per year. But habitat tolerance is very broad, found in lowland rainforest, semi-desert grassland, fynbos (with dense grass) and pine plantations (Child *et al.* 2016).	-Breeding season during spring and summer months in southern Africa. -Usually only one litter per season, comprises of 1-3 pups, fully grown at 20 weeks.	-Small mammal specialist, up to own body weight in size, but occasionally takes birds also. -Has fast metabolism and requires an abundance of prey in territory (Child *et al.* 2016). -Very close association with mole-rats, likely as a food source but also for habitat preference, especially in western, drier sections of its range (Child *et al.* 2016).
TERRESTRIAL INVERTEBRATES				
Chrysoritis thysbe mithras Brenton Sparkling Opal Butterfly[4]	Critically Endangered	-Endemic to the Western Cape Province, only recorded from the Still Bay area in the west, Brenton on Sea near Knysna and from Goesabos (Tsitsikamma) in the east. -Declining due to dense stands of alien plant invasions.	-Adults are on wing year-round with peaks in October and March.	-Larvae feed on *Chrysanthemoides incana, C. monilifera, Osteospermum polygaloides, Lebeckia plukenetiana, Aspalathus, Zygophyllum* and *Thesium* spp. -Host ant species is *Crematogaster peringueyi* ants.

Species	Red list status	Habitat	Breeding	Feeding
		-At Brenton on Sea on both north- and south-facing slopes at an altitude of 80 m to 120 m in disturbed areas of Knysna Sand Fynbos with a high abundance of *Osteospermum monilifera* (Bitou). -Habitat at Stilbaai is by contrast on limestone fynbos-covered hillsides at altitudes up to 300 m.		
Orachrysops niobe Brenton Blue Butterfly[4]	Critically Endangered	-Highly range-restricted endemic to the Western Cape. -Cool, moist south-facing slopes close to the sea at 90 m to 115 m altitude. -Mosaic of open and dense vegetation consisting of dune thicket, fynbos and forest.	-Adults are on wing from October to November and from February to March. There are two generations per year	-Larvae feed on the rootstock of *Indigofera erecta*. -Host ant species *Camponotus baynei*
Thestor brachycerus brachycerus Knysna Skolly Butterfly[4]	Critically Endangered	-Endemic, range-restricted, known only from the Knysna area in the Western Cape. -Currently restricted to two small subpopulations on the coast east of Coney Glen just above sea level.	-Adults are on the wing from December to January. There is one generation per year.	-Larvae have been found in the nests of the pugnacious ant, *Anoplolepis custodiens*, but the larval food is unknown.

Species	Red list status	Habitat	Breeding	Feeding
		-Butterfly and its host ant both require patches of open vegetation with significant bare ground or rocks. -Inland habitat is on north-, north-east- and north-west-facing slopes covered with Knysna Sand Fynbos, originally with a warm, dry, fire-prone microclimate promoting low fynbos vegetation and patches of open sandy soil and animal paths. -Coastal habitat close to the sea to the east of Coney Glen at the Knysna Heads, with a completely different microclimate (south-facing, moist, sea spray) and vegetation type (Cape Seashore vegetation). -General requirements are low vegetation and a sunny, warm microclimate in midsummer, promoting good host ant populations.		
Aloeides thyra orientis	Endangered	-Restricted range taxon endemic to the Western Cape from Witsand to Gouritsmond in the west, to the	-Adults are on wing from July to April with peaks in October and February.	- Larvae feed on *Aspalathus acuminata, A. laricifolia* and *A. cymbiformis*. -The larvae are attended to by *Lepisiota capensis* ants.

Species	Red list status	Habitat	Breeding	Feeding
Red Copper Butterfly[4]		Brenton Peninsula near Knysna in the east. -Declining because of alien plant encroachment and lack of regular burning of the fynbos. -Coastal fynbos on flat sandy ground (either naturally occurring or from anthropogenic disturbances such as footpaths or unsurfaced track) between 40 m to 240 m above sea level.	-Several generations per year through the warmer months.	
Procydrela precursor Ground-dwelling Spider[1]	Endangered	-Free living and ground dwelling spider. -Endemic to South Africa, found in Western Cape and Eastern Cape provinces. -One of the biggest threats to the species is loss of habitat to housing development within its range. -Plantations also pose a potential threat to if it is unable to survive in this landscape.	Not known	Not known
Aneuryphymus montanus	Vulnerable	-Very low area of occupancy between 100 and 1000 km^2. Threatened by	-Little is known about the feeding requirements of this species.	-Little is known about the reproductive habits or requirements for this species.

Species	Red list status	Habitat	Breeding	Feeding
Yellow-winged Agile Grasshopper[1]		declining habitat due to invasion by aliens and habitat transformation. -Strong association with sclerophyllous fynbos vegetation on the southern slopes of the Outeniqua mountains, post-fire. -Threats to the species include habitat transformation and invasion by alien plants.		
Circellium bacchus Flightless dung beetle[3]	Vulnerable	-Endemic to South Africa, on the Southern coastline in the winter and bimodal rainfall regions. -Habitat types include the Albany Thicket and Fynbos biome, including vegetation units in Shale Renosterveld (FRs), Limestone Fynbos (FFl), Sandstone Fynbos (FFs), Sand Fynbos (FFd), Strandveld (FS). -No association shown with a particular soil type (Davis *et al.* 2020) -Abundant in dense shrub/woodland on sandy soils; most uncommon in	-In Addo Elephant National Park: Buffalo and cattle dung preferred for breeding, but also recorded on dung of monkey, human, rhinoceros, hare, ostrich (Davis *et al.* 2020).	-Elephant dung preferred for feeding but also recorded on dung of monkey, human, rhinoceros, hare, ostrich (Davis *et al.* 2020).

Species	Red list status	Habitat	Breeding	Feeding
		adjacent disturbed open vegetation (Davis *et al.* 2020). -Flightless, ectothermic and diurnal with maximal activity between 18–26°C, particularly after rainfall (Davis *et al.* 2020).		
Aloeides pallida littoralis Knysna Pale Copper Butterfly[4]	Near Threatened	- Endemic taxon to the Western Cape Province. -Relatively flat terrain near the coast, coastal Fynbos	-Little known, but *Lepisiota capensis* ants are hosts for subspecies *A. p. grandis*.	-Little is known, but larval food for the subspecies *A. p. pallida* and *A. p. jonathani* feed on *Aspalathus* species. The larvae of subspecies *A. p. grandis* are fed by trophallaxis by *Lepisiota capensis* ants and feed on these ant eggs.
AMPHIBIANS				
Afrixalus knysnae Knysna Leaf-folding Frog[1]	Endangered	- Typically inhabit endorheic (inward draining) wetlands with shallow water (< 50cm), high clarity, and sufficient vegetation suitable for breeding. - No streaming or running water recorded at any of the sites where they've been recorded. -The frog is associated with vegetation it can use for breeding which includes indigenous and exotic species. For example, slender	- Females lay eggs on leaves which are folded and sealed by males, creating a protected environment. - Breeding occurs during warmer wetter months such as September to November (F. De Lange 2019). - Breeding takes place near deeper parts of the waterbody, but still close to the water's edge.	- Insectivorous, feeding on small invertebrates found in its habitat (e.g. insects and spiders). - Foraging behaviour includes actively searching for prey on the forest/fynbos floor and in the leaf litter. - Uses its sticky, projectile tongue to capture and quickly ingest prey. - Primarily active at night, relying on its vision to locate and capture prey in the darkness.

Species	Red list status	Habitat	Breeding	Feeding
		knotweed (*Persicaria decipiens*) and kikuyu grass (*Pennisetum clandestinum*). -It requires a habitat with diverse plant species, including shrubs, grasses, and ferns, providing shelter and breeding sites (De Lange and Du Preez 2018).		

4. FIELD ASSESSMENT

4.1 Methods

Following the Species Environmental Assessment Guidelines (SANBI 2020) and Table 3, taxa-specific sampling techniques were conducted in habitats where SCC were likely to occur. Taxa-specific sampling was interspersed with a meander across the project area to collect additional opportunistic data for all fauna and inspect all habitat types (Table 4).

Table 4. Sampling techniques conducted for potential SCC occurring Portion 76/216 Uitzigt Farm.

Taxa	Field methods	Public platform where observations were reported
Avifauna	• Meander* across site for direct observations. • 8 point counts (5-minute bird counts).	Birdlasser (species lists), iNaturalist (photos)
Mammals	• Meander* across site for direct observations, tracks, scats and signs. • Camera trapping (2 cameras active for 36 hours, spanning two nights).	iNaturalist (photos)
Amphibia	• Meander* across site for direct observations. • Active searching.	iNaturalist (photos)
Invertebrates	• Meander* across site for direct observations. • Active searching. • Pitfall trapping. • Sweep netting.	iNaturalist (photos)

* Meandering involved 4.3 km of slow walking across the site through various habitat types and key landscape features. Active observations took place for all fauna throughout this walk which was then supplemented by taxa specific sampling methods in habitats deemed most suitable for SCC.

4.2 Assumptions and Limitations

1. While the public platforms mentioned in Section 3.4 are excellent sources of additional information for animal species occurring within an area, these results require some expert interpretation to determine which of the SCC are relevant to include in the faunal assessment of the project area. For example, the coarse spatial scale of reporting within the Virtual Museum platforms (Quarter Degree Square level (27km x 27km) or SABAP2 pentad level (9km x 7 km)) can result in species records from habitats quite different to those present on site. Additionally, these platforms include sightings of

vagrant or transient animals upon which an assessment cannot reasonably be based. Expert interpretation is therefore applied to the full list of SCC identified by the various public platforms (see Appendix 1) and some species are then excluded from further assessment due to the project area clearly lacking suitable habitat or the species clearly representing a vagrant or transient animal outside its normal range. The SCC assessed in this report therefore represent those which may reasonably occur on site. However, there is always the possibility that some SCC (although highly unlikely to occur on site) are overlooked in this process.

2. Three field visits took place to the site for the faunal assessment. While this increased the likelihood of detecting animal species, this still only represents a few “snap-shots” in time and it is possible that SCC occurring on site were not observed during these visits. These results should therefore be interpreted with this in mind and not be treated as an exhaustive list of species occurring on site.
3. The author of this report was only present during two of the three site visits. However, any evidence (photos, recordings, direct and verified observations) and information pertaining to fauna collected by team members on the other site visit is included in this report. This information is however interpreted with caution.
4. Site visits took place during daylight hours so the likelihood of encountering nocturnal species was limited. Camera traps were however used to assist in detecting nocturnal (and diurnal) animals over a 36-hour period.
5. The site visit coincided with early summer months. This may be of consequence for some species showing seasonal variation in breeding and activity patterns, however for the frog SCC this time falls within the breeding season and increases the likelihood of detection. Similarly, this is the optimal time of year to detect the presence golden moles, which are generally most active in warmer and wetter conditions.
6. Evidence of animals in the form of tracks, scats and signs always brings with it a level of uncertainty, but best efforts were made in this regard and uncertainties are highlighted in the report.
7. Due to time constraints, pitfall trapping was limited to one site visit (October 2023), and was done over 6-hour period during daylight hours (11h00 to 17h00). This limited sampling period placed constraints on the invertebrates caught by this method and this data should be interpreted as a minimum estimate.

4.3 Site Inspection Details

Three site visits took place to Portion 76/216 Uitzigt Farm on 11 October, 5 December and 7 December 2023. Weather on all days was partly cloudy and warm, but the wind picked up in the afternoon of the 7th December reducing the effectiveness of sweep netting and photographing invertebrates. Habitat types found on the site consist mainly of Strandveld-Fynbos, with some areas invaded by alien plants in the north (by Pine trees) and in the valleys in the middle and south of the site (by Rooikrans trees (*Acacia cyclops*)) (Figure 8). An effort was made to cover the project area with the meander and to conduct taxa specific sampling techniques across a range of suitable habitats for potential SCC (Figure 9).

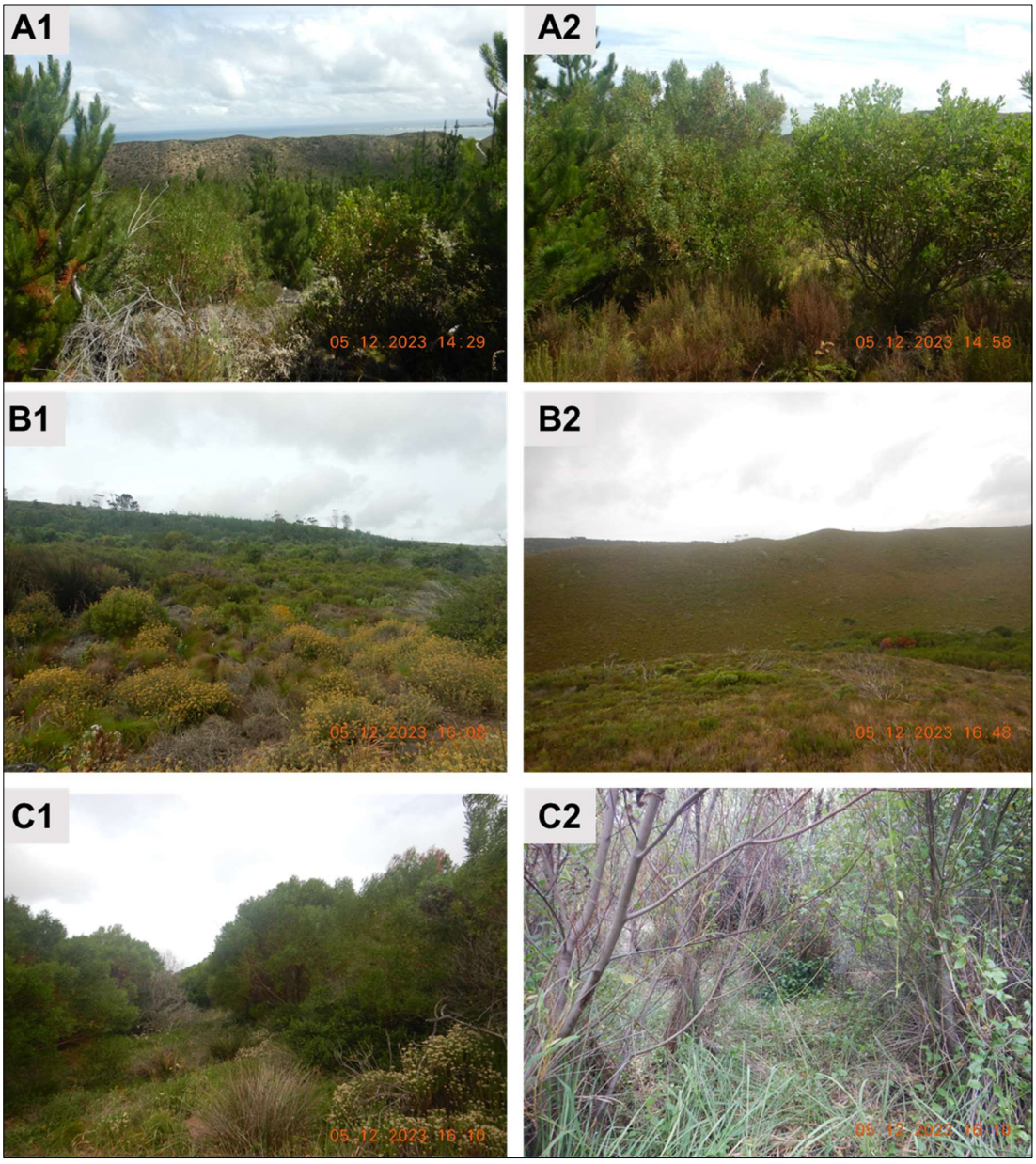

Figure 8. Habitat types identified on Portion 76/216 Uitzigt Farm. Modified Fynbos with Pine sp. invasions (A), Strandveld-Fynbos (B), and invaded valley bush with thickets of alien Rooikrans (Acacia cyclops) (C).

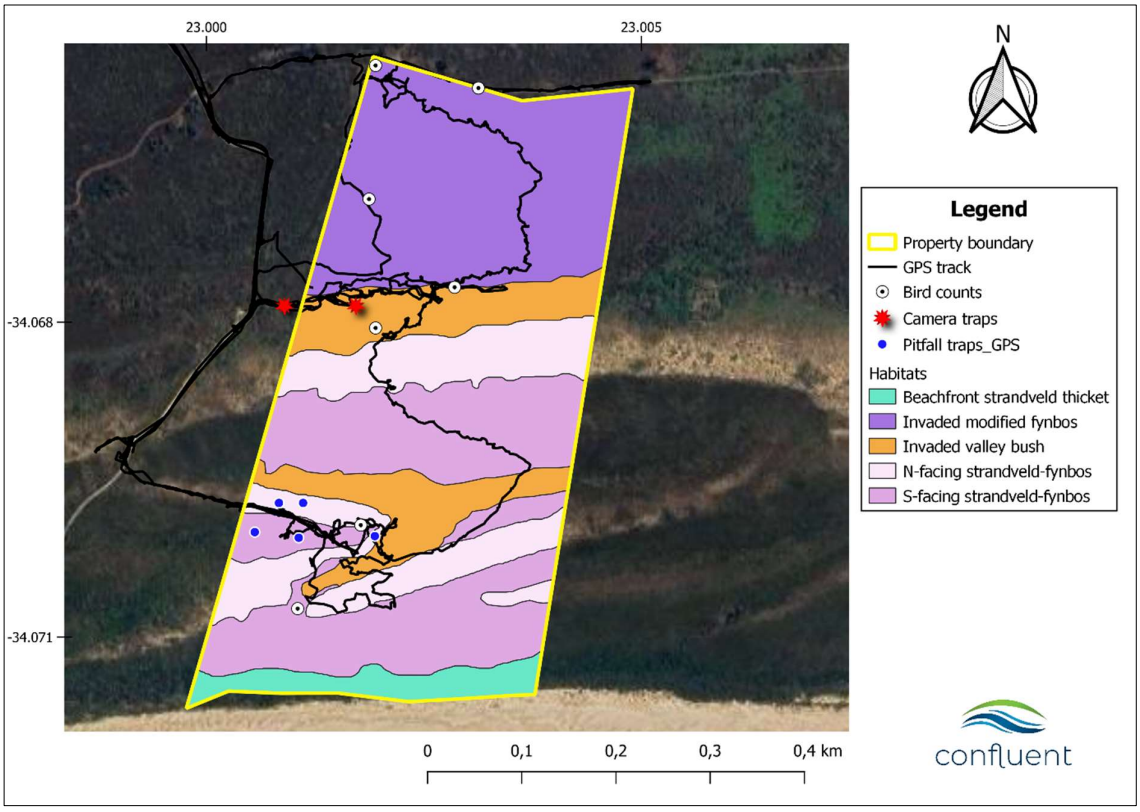

Figure 9. Habitats found on Portion 76/216 Uitzigt Farm and GPS tracks of the site visits conducted in October and December 2023.

4.4 Results

4.4.1 Avifauna

No SCC was encountered during the site visit. Seven bird counts were conducted across the property, in addition to opportunistic sightings noted throughout the meander and searching for nests/roosting sites in suspected habitat. A total of 12 bird species were identified during the site visit (See Appendix 2, Figure 10).

Figure 10. Karoo Prinia (Prinia maculosa) seen during a site visit to Portion 76/216 Uitzigt Farm.

4.4.2 Mammals

No SCC were found during the site visits. A bushbuck was recorded on the camera traps placed within the Rooikrans thicket in the middle of the site, showing one animal walking past and sniffing the camera (Figure 11). Other mammal species on the site were identified by the presence of dung, characteristic of Cape Porcupine and Chacma Baboons (Figure 11). A midden of small antelope dung was also found on site (Figure 11), however this was not considered indicative of Sensitive species 8, as it was found in a relatively open area (not typical habitat for this species) and the size and shape of the dung (sharp-pointed, elongate, > 1cm in length) was not characteristic of Sensitive Species 8 (round and smaller droppings, < 1cm in length) (Walker 1996). It is acknowledged that species identification by dung includes a level of uncertainty, however based on size and shape of the droppings, in addition to unlikely habitat, Sensitive Species 8 is not suspected (Figure 12). Although difficult to accurately identify, the small antelope dung is suspected to be from Cape Grysbok (*Raphicerus melanotis*), which is known to occur in the Goukamma Nature Reserve ca. 3 km west of the site. There was no evidence of sub-surface tunneling by golden moles found on site, although these SCC do have a low likelihood of detection. There was substantial evidence of mole rat activity, particularly in the valleys of the dunes, where ample mole hills were observed (Figure 11). See Appendix 3 for the list of mammals observed on Portion 76/216 Uitzigt Farm during the site visits.

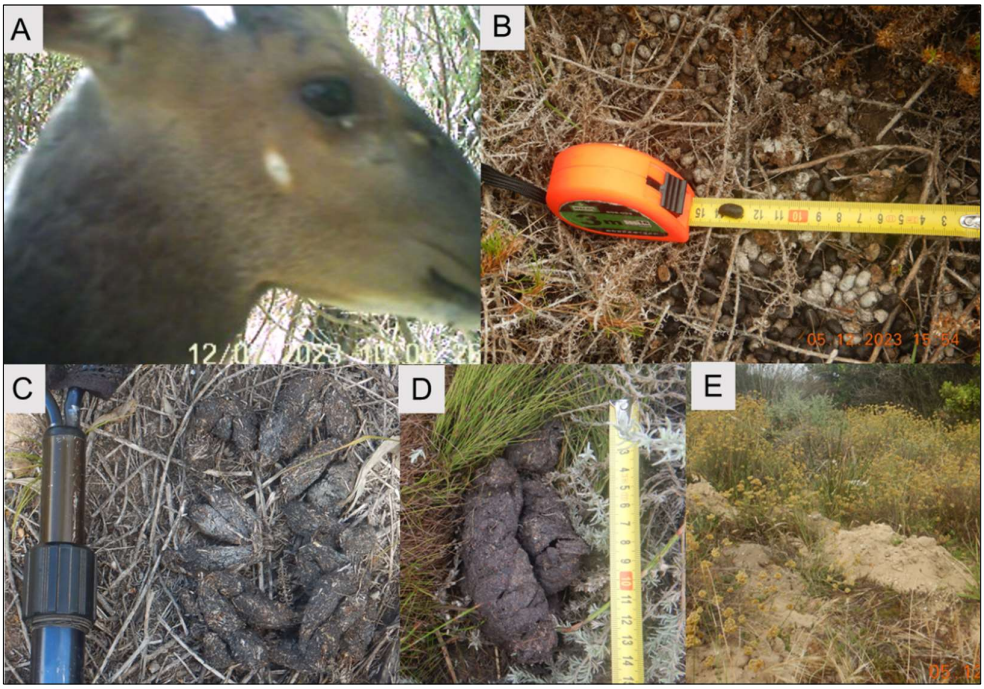

Figure 11. Mammal species identified during site visits to Portion 76/216 Uitzigt Farm. Southern Bushbuck (Tragelaphus sylvaticus) caught on video by camera trap in the Rooikrans stands in the middle of property (A). Scats observed and identified to likely species including a small antelope (suspect Cape Grysbok (Raphicerus melanotis.)) (B), Cape Porcupine (Hystrix africaeaustralis) (C) and Chacma Baboon (Papio ursinus) (D). Mole rat activity ascribed to many molehills seen (Family: Bathyergidae) (E).

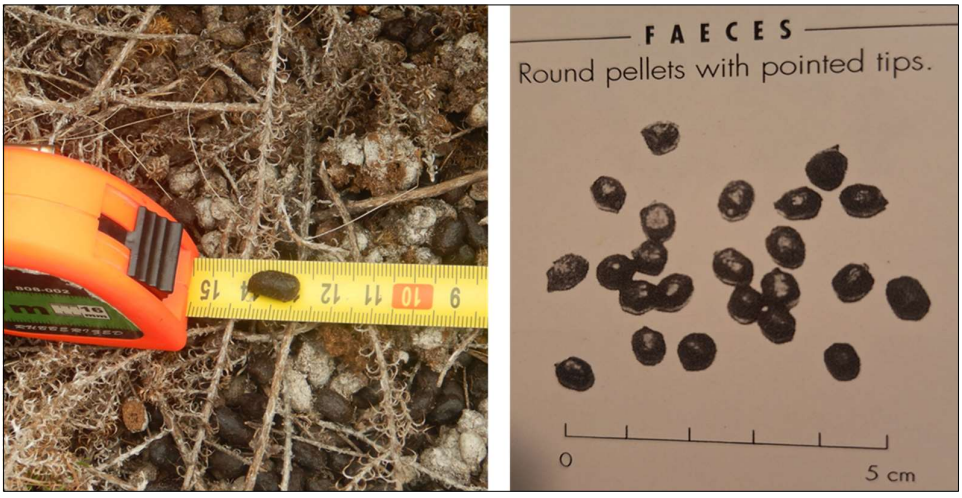

Figure 12. Comparison of small antelope dung found on Portion 76/216 Uitzigt Farm (left) to documented shape and size of dung from Sensitive Species 8 (right) (Walker 1996).

4.4.3 Terrestrial Invertebrates

One SCC was found during the site inspections: one specimen of the Cape Flightless Dung Beetle (*Circellium bacchus*) was sampled by sweep netting in October 2023 (Figure 13).

Figure 13. Cape Flightless Dung Beetle (Circellium bacchus) sampled on Portion 76/216 Uitzigt Farm during a site visit in October 2023.

Five pitfall traps were set in the south of the property to assess ground-dwelling invertebrates in the footprint of the planned main dwelling. These yielded very little results and no SCC were sampled. It is acknowledged that the limited trapping duration (6-hours the duration of the field visit in daylight hours) may have limited these results, and while caution is applied to these findings, they indicated low activity levels of ground-dwelling invertebrates within the area.

During the site visits in December 2023, a lot of butterfly activity was noted in the dune valley in the middle of the site, likely due to the abundance of plants in bloom at the time. While no butterfly SCC was observed or sampled on site, a few host plant species were observed (Table 5). Additionally, *Crematogaster peringueyi* the ant host species for the Brenton Sparkling Opal Butterfly *(Chrysoritis thysbe mithras*) was observed on site. In total, invertebrates from 11 Families were photographed and identified from site (Figure 14, see also Appendix 4).

Table 5. Host plants for butterfly SCC observed on Portion 76/216 Uitzigt Farm during site visits. For more information on plant observations, refer to Botanical Specialist Report (Bianke Fouche, Confluent Environmental).

Butterfly SCC	Larval host plant species observed
Chrysoritis thysbe mithras Brenton Sparkling Opal Butterfly (Critically Endangered)	*Osteospermum polygaloides* *Aspalathus* spp. *Thesium* spp.
Orachrysops niobe Brenton Blue Butterfly (Critically Endangered)	*Indigofera erecta*
Aloeides pallida littoralis Knysna Pale Copper Butterfly (Near Threatened)	*Aspalathus* spp.

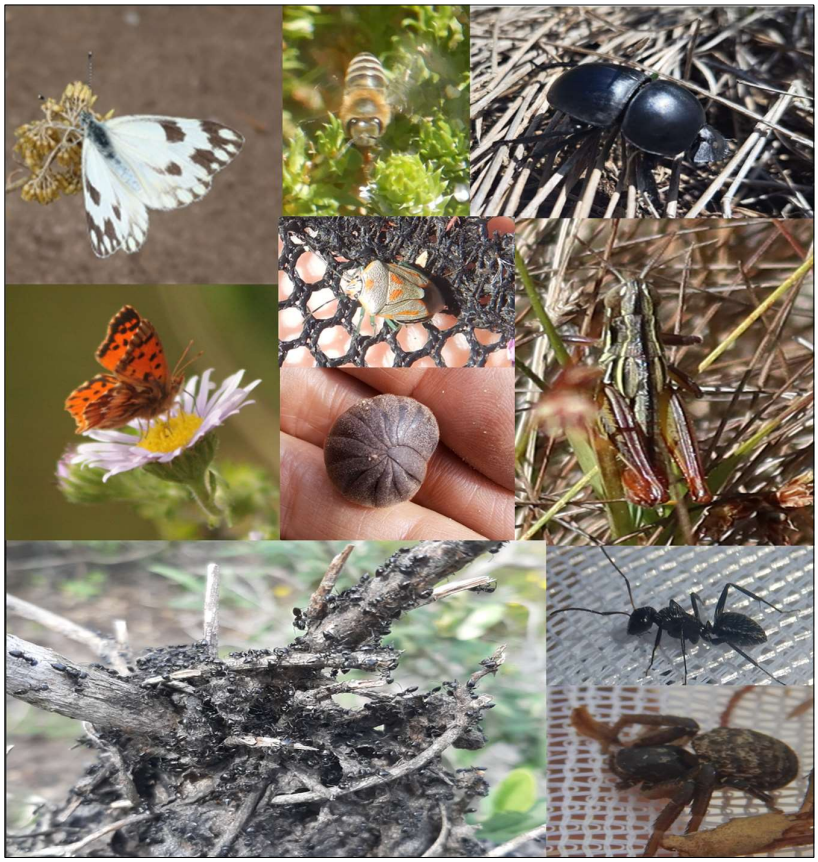

Figure 14. Invertebrates photographed on Portion 76/216 Uitzigt Farm during the site inspections in October and December 2023.

4.4.4 Amphibians

No SCC were encountered during the site visit and no amphibians were found, which is not surprising given the lack of any waterbodies/watercourses present on site. Consequently, there was no suitable habitat for the Knysna Leaf-folding Frog (*A. knysnae*).

4.4.5 Reptiles

No reptile SCC were highlighted for this site by the DFFE Screening Tool or any of the public platforms. As such, no targeted sampling took place for this group. However, the remains (shell) of an Angulate Tortoise (*Chersina angulata*) was found on site during the meander. It had been deceased for some time with most scutes detached from the carapace, which was already whitening due to prolonged sun exposure (Figure 15, Appendix 5).

Figure 15. Remains of an Angulate Tortoise (Chersina angulata) showing a scute (left) and the carapace whitened by prolonged sun exposure (right) found on Portion 76/216 Uitzigt Farm during site inspections in October and December 2023.

4.4.6 Likelihood of Occurrence for SCC

Following the terrestrial fauna surveys and site inspection, the possible SCC occurring on Portion 76/216 Uitzigt Farm were evaluated according to their likelihood of occurrence. It is always possible that a species assessed as having a low probability of occurrence can still occur on the site, especially for the golden moles species which are listed as having a low likelihood of detection (SANBI 2020), and therefore this table should only be used as a guideline.

Table 6. Likelihood of occurrence for terrestrial fauna SCC on Portion 76/216 Uitzigt Farm.

Species	Red list status	Observed on site	Suitable habitat	Likelihood of occurrence	Reason
AVIFAUNA					
Circus maurus Black Harrier	Endangered	No	Yes	Medium-High	Suitable natural fynbos habitat throughout majority of site, high connectivity to large natural spaces in surrounding areas and ample prey (rodents and birds) available on site. SCC is listed as occurring in Goukamma Nature Reserve (within 3 km of site) and within the SABAP2 pentads of the site. Although sightings are not common, the precautionary principle is applied for this SCC and it is assumed to be present.
Circus ranivorus Marsh Harrier	Endangered	No	No	Low	No suitable marshland vegetation or waterbodies on site or within immediate surroundings to be attractive for this SCC.
Polemaetus bellicosus Martial Eagle	Endangered	No	Possible	Low	Rare visitor to the region with a preference for savanna, karoo shrubland and semi-desert environments. Limited tall trees for perching, only few tall Eucalyptus trees in the North of the site. Last reported in the SABAP2 pentads around the site in 2014 and 2017.
Bradypterus sylvaticus Knysna Warbler	Vulnerable	No	No	Low	No suitable habitat given the lack of rivers or other waterbodies on site.
Falco biarmicus Lanner Falcon	Vulnerable	No	No	Low	No suitable habitat, with no cliffs for breeding and limited open grassland areas (preferred by SCC) within the shrubby Fynbos habitat on site.
Stephanoaetus coronatus Crowned Eagle	Vulnerable	No	No	Low	No suitable habitat. Site lacks forest vegetation and has very limited large trees.

Species	Red list status	Observed on site	Suitable habitat	Likelihood of occurrence	Reason
Anthropoides paradiseus Blue Crane	Near Threatened TOPS: Protected (2023 DRAFT) CITES: Appendix II	No	No	Low	No suitable habitat. Site lacks open grassy or wetland habitat.
Campethera notata Knysna Woodpecker	Near Threatened	No	Possible	Low	Marginally suitable habitat. Site has limited large trees and no dense forest/thicket vegetation on site. SCC has marginal occurrence in *Protea* communities, but given the distance to any core (thicket/forest) habitats within the landscape this SCC is given a low likelihood of occurring on site.
Buteo trizonatus Forest Buzzard	Least Concern (Regional), Near Threatened (Global)	No	No	Low	No suitable habitat. Site has no forests or plantations required by SCC.
MAMMALS					
Chlorotalpa duthieae Duthie's Golden Mole	Vulnerable	No	No	Low	No suitable habitat. Site has no suitable forest habitat, and none is observed in immediate surroundings.

Species	Red list status	Observed on site	Suitable habitat	Likelihood of occurrence	Reason
Panthera pardus Leopard	Vulnerable	No	Yes	Medium-High	Site has uninterrupted connectivity to large natural areas including protected areas where SCC is known to occur (e.g. Goukamma Nature Reserve). Fynbos habitat on site can provide suitable habitat for shelter and prey species (antelope) are present on site. Additionally, there is limited to no human disturbance on the site and immediate surroundings.
Sensitive Species 8	Vulnerable	No	No	Low	No suitable habitat. No forest or sufficient thicket vegetation for SCC.
Amblysomus corriae Fynbos Golden Mole	Near Threatened	No	Possible	Medium	Suspected, but limited suitable habitat. Site has suitable fynbos vegetation and sandy soils for SCC, although it is known to prefer rich and moist soils (very limited on site given lack of watercourses or waterbodies) along forest fringes (not present on site). Given that this SCC has a low likelihood of detection (SANBI 2020), and the longstanding undisturbed natural condition of the site in addition to its connectivity to a large natural spaces and protected areas, the precautionary principle is applied for this SCC and it is assumed to be present.
Leptailurus serval Serval	Near Threatened TOPS: Protected (2023 DRAFT) CITES: Appendix II	No	No	Low	No suitable habitat. Proximity to water essential for SCC (none present on site) and preference for marshland/wetland vegetation (not present on site).

Species	Red list status	Observed on site	Suitable habitat	Likelihood of occurrence	Reason
Poecilogale albinucha African Striped Weasel	Near Threatened	No	Possible	Medium	SCC has broad habitat tolerance, known to occur in Fynbos biome and very easily overlooked given its nocturnal habits and being well adapted to subterranean lifestyle. Close association with mole-rats (activity observed on site). Given the high connection to natural, protected areas within the landscape, evidence of mole rat activity on site and its cryptic nature, the precautionary principle is applied to SCC and it is assumed to be present.
TERRESTRIAL INVERTEBRATES					
Chrysoritis thysbe mithras Brenton Sparkling Opal Butterfly	Critically Endangered	No	Yes	High	Site is in close proximity to Brenton on Sea, a known location for this SCC. Site has both north- and south-facing slopes within mapped Knysna Sand Fynbos. Many larval host plant species are present on site (see Table 5) and the host ant species (*Crematogaster peringueyi*) was found on site. Following the precautionary principle and habitat suitability this SCC is assumed to be present on site.
Orachrysops niobe Brenton Blue Butterfly	Critically Endangered	No	Possible	Medium	Site has south-facing slopes close to the sea and the larval host plant was found (Table 5). However, the site is not prime habitat for the SCC given its preference for a mosaic of open and dense vegetation consisting of dune thicket (limited to the south of site), fynbos (prolific across site) and forest (absent on site). It is also noted that the last records of this species are from the Brenton Blue Butterfly Nature Reserve (within 3km to the east of the site), however this population is separated from the site by the urban development of Brenton on Sea. The precautionary principle is applied to the SCC given the presence of the host plant, the close proximity to a

Species	Red list status	Observed on site	Suitable habitat	Likelihood of occurrence	Reason
					previously known population, potential habitat and the longstanding undisturbed and connected nature of the site.
Thestor brachycerus brachycerus Knysna Skolly	Critically Endangered	No	Possible	Medium	Marginal habitat on site for SCC. While the site does not have extensive bare ground or rocky habitat preferred by SCC, it does offer patches of low fynbos vegetation and some patches of open sandy soil (on the crest of dunes and towards the coast in the south of the site). Given that the SCC is currently restricted to two small subpopulations on the coast east of Coney Glen (ca. 5 km from site, disconnected by the Knysna estuary inlet and Brenton on Sea urban development) is it unlikely to occur on site, however, the precautionary principle is applied due to suspected habitat and the longstanding undisturbed and connected nature of the site.
Aloeides thyra orientis Red Copper Butterfly	Endangered	No	No	Medium	Limited but possibly suitable habitat. Coastal fynbos is present on site, however there is not much flat sandy ground considering the undulating landscape and the lack of disturbances present on site. No larval host plants were observed on site. However, the precautionary principle is applied due to suspected habitat and the longstanding natural state and connectivity of the site.
Procydrela precursor Ground-dwelling Spider	Endangered	No	Possible	Medium	Given that no information is available for this SCC's habitat requirements, and the DFFE Screening Tool mapping the site as potential habitat, the precautionary approach is applied, and the SCC is presumed present.
Aneuryphymus montanus	Vulnerable	No	No	Low	No suitable sclerophyllous fynbos habitat.

Species	Red list status	Observed on site	Suitable habitat	Likelihood of occurrence	Reason
Yellow-winged Agile Grasshopper					
Circellium bacchus Flightless dung beetle	Vulnerable	Yes	Yes	Confirmed	SCC found during October 2023 site visit.
Aloeides pallida littoralis Knysna Pale Copper	Near Threatened	No	No	Medium	Site has coastal fynbos, but limited flat terrain preferred by SCC. A larval host plant species was observed on site, and there is some, although limited, flat terrain at the crest and troughs of the dunes in the south of the property. Therefore, the precautionary principle is applied due to suspected habitat and the longstanding natural state and connectivity of the site.
AMPHIBIANS					
Afrixalus knysnae Knysna Leaf-folding Frog	Endangered	No	No	Low	No suitable habitat (waterbodies, wetlands) on site.

5. SITE SENSITIVITY VERIFICATION

After the site visit and fauna surveys, it is determined that the site sensitivity for the terrestrial animal theme of Portion 76/216 Uitzigt Farm is **VERY HIGH** in contrast to the high and medium sensitivities highlighted by the DFFE Screening tool.

Based on the information in this report during the desktop and field assessment, the following reasons support this finding:

- The discovery of the Cape Flightless Dung Beetle (*Circellium bacchus*) listed as Vulnerable, thereby resulting in the VERY HIGH sensitivity rating across the site where the SCC is expected to occur.
- The high and medium likelihood of occurrence of several SCC largely owing to the long-standing natural and undisturbed state of the site over the last 88 years, as well as its placement within a greater natural area (most of the surrounding landscape) highly connected to protected areas within 5 km of the site.

As per the Published Government Notice No. 1150, Government Gazette 43855 (30 October 2020), the **VERY HIGH** sensitivity of the site requires a Terrestrial Animal Species Specialist Assessment to be conducted.

6. SITE ECOLOGICAL IMPORTANCE

The Site Ecological Importance (SEI) is determined for habitats within the property, taking associated fauna SCC into account (Table 7). Table 8 provides the SEI calculations for each habitat type (see Appendix 6 for SEI methods) and Figure 16 illustrates the SEI results for the property.

It is important to note that the SEI reported here is specific to the proposed development and associated activities of this report and can only be used to compare multiple layouts and/or locations for the development.

Table 7. SCC likely or confirmed to occur on Portion 76/216 Uitzigt Farm and assessed for Site Ecological Importance.

Classification	Scientific name	Common name	Red list status and criteria	Likelihood of occurrence on site based on habitat suitability
Avifauna	*Circus maurus*	Black Harrier	Endangered, Criteria C1+2a(ii) Near endemic	High
Mammal	*Panthera pardus*	Leopard	Vulnerable, Criteria C1	Medium-High
Mammal	*Amblysomus corriae*	Fynbos Golden Mole	Near Threatened, Criteria B2b(iii)	Medium
Mammal	*Poecilogale albinucha*	African Striped Weasel	Near Threatened, Criteria C1	Medium
Invertebrate	*Chrysoritis thysbe mithras*	Brenton Sparkling Opal Butterfly	Critically Endangered, Criteria C + Possibly Extinct	High
Invertebrate	*Orachrysops niobe*	Brenton Blue Butterfly	Critically Endangered, Criteria A2ac; B1ab(iii,v) +2ab(iii,v); C1+2a(i,ii); D	Medium
Invertebrate	*Thestor brachycerus brachycerus*	Knysna Skolly	Critically Endangered, Criteria B	Medium
Invertebrate	*Aloeides thyra orientis*	Red Copper Butterfly	Endangered, Criteria B	Medium

Classification	Scientific name	Common name	Red list status and criteria	Likelihood of occurrence on site based on habitat suitability
Invertebrate	*Procydrela precursor*	Ground-dwelling Spider	Endangered, No criteria listed	Medium
Invertebrate	*Circellium bacchus*	Flightless Dung Beetle	Vulnerable, No criteria listed	Confirmed presence on site
Invertebrate	*Aloeides pallida littoralis*	Knysna Pale Copper	Near Threatened, Criteria B	Medium

Table 8. Site Ecological Importance assessment for Portion 76/216 Uitzigt Farm. Conservation status for SCC is abbreviated to indicate Critically Rare/Endangered (CR), Endangered (EN), Vulnerable (VU) or Near Threatened (NT). When relevant, the extent of occurrence (EOO) is indicated as part of the justification for the conservation importance (CI) metric.

Habitat and associated SCC	Conservation Importance (CI)	Functional Integrity (FI)	Biodiversity Importance	Receptor Resilience (RR)	Site Ecological Importance (SEI)
Modified Fynbos with Pine invasion <u>SCC:</u> *P. pardus* *A. corriae* *P. albinucha* *P. precursor* *C. bacchus*	**VERY HIGH** Habitat contains Knysna Sand Fynbos (CR), despite low-moderate levels of alien plant invasion. With no information about habitat preferences and EOO for *P. precursor* (EN), in addition to the DFFE Screening Tool mapping this as potential habitat, the precautionary approach is followed for the SCC and it is assumed likely to occur, with EOO < 10 km^2. **HIGH**	**HIGH** Good habitat connectivity with potentially functional ecological corridors for all SCC. Minimal current negative ecological impacts despite some alien plant invasion, with no signs of major past disturbance.	**VERY HIGH**	**HIGH** Modified Fynbos can recover to its modified state relatively quickly < 10 years and by association most fauna can be expected to return soon as well. Considering the current SDP options and type of activities associated with the two residential units on the property, fauna SCC are highly likely to remain on the property during development or are highly likely to return to site after disturbance.	**HIGH** BI = Very High RR = High

Habitat and associated SCC	Conservation Importance (CI)	Functional Integrity (FI)	Biodiversity Importance	Receptor Resilience (RR)	Site Ecological Importance (SEI)
	Confirmed occurrence of *C. bacchus* (VU, EOO > 10km^2) on site. All other associated SCC listed under criteria B or C.				
Strandveld Fynbos & Dune thicket <u>SCC:</u> *C. maurus* *P. pardus* *A. corriae* *P. albinucha* *C. thysbe mithras* *O. niobe* *T. brachycerus brachycerus* *A. thyra orientis*	**VERY HIGH** Habitat contains Knysna Sand Fynbos (CR) in natural condition. Host plant for *O. niobe* (CR, global EOO of < 10 km^2) occurs in habitat. Following the precautionary principle, the SCC is assumed likely to occur on site or can be reintroduced. **HIGH** Confirmed occurrence of *C. bacchus* (VU, EOO > 10km^2) on site. All other associated SCC are listed under criteria B or C.	**VERY HIGH** 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.	**VERY HIGH**	**HIGH** Given that this habitat was severely burnt in 2017 during Knysna fires, this Fynbos vegetation should recover to its current natural state in < 10 years and by association most fauna can be expected to return soon as well. Considering the current SDPs, the type of activities associated with residential units, in addition to the amount of habitat remaining undeveloped on the property, fauna SCC are highly likely to remain on the property during development or are highly likely to return after disturbance.	**HIGH** BI = Very High RR = High

Habitat and associated SCC	Conservation Importance (CI)	Functional Integrity (FI)	Biodiversity Importance	Receptor Resilience (RR)	Site Ecological Importance (SEI)
P. precursor *C. bacchus* *A. pallida* *littoralis*					
Invaded valley areas SCC: *P. pardus* *A. corriae* *P. albinucha* *P. precursor* *C. bacchus*	**MEDIUM** While *C. bacchus* (VU, EOO > 10km^2) was found on site and other associated SCC are listed under criteria B or C with EOO > 10km^2, they likely only have a marginal occurrence within this highly modified habitat, and are unlikely to rely on it for their survival on site.	**LOW** Habitat consists mostly of alien plants (*Acacia cyclops*) imposing major current negative ecological impacts. The extent (size) of this habitat type is also limited within the property.	**LOW**	**VERY HIGH** Given the high levels of alien plant invasion, this habitat can recover rapidly back its modified state.	**VERY LOW** BI = Low RR = Very High

Figure 16. Site Ecological Importance map with regards to fauna for Portion 76/216 Uitzigt Farm.

Most of the property has a high SEI rating with regards to terrestrial fauna. According to the guidelines for interpreting SEI ratings in terms of development (Table 9, (SANBI 2020)), high SEI areas should be avoided where possible, but minimization mitigation measures may be acceptable when the development: 1) limits the amount of habitat impacted, and 2) associated activities are limited and are of low impact. However, it is imperative that mitigation measures are strictly adhered to and that all measures are taken to reduce the development footprint wherever possible to minimize negative impacts on the faunal community and reduce the amount of natural habitat lost as well as habitat fragmentation.

Table 9. Guidelines for interpreting Site Ecological Importance for proposed developments (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.

7. IMPACT ASSESSMENT

This impact assessment is based on the three SDP options available at the time of writing this report and will need to be reassessed if these change in the future. The impact assessment considers the construction of three SDP options suggested for the property outlined in 1.2 (Development Layout).

Impacts (pre- and post-mitigation) are evaluated for the three SDP options and presented in tables included in this assessment and the methods explained in Appendix 8. The differences between the alternatives presented were not substantial enough to change the significance of the impacts, nonetheless impact assessment tables for all SDP three options are presented. It is important to note however that SDP Alternative 2 has the smallest development footprint due to the shorter access road and only one dwelling (see Section 1.2 Development Layout), and even though this was not enough to change the significance of the results of the impact assessment given the criteria as outlined in the methods (see Appendix 8: Impact Assessment Methods), there is an overall reduction in the extent of the impacts associated with this SDP option (most notably a decrease in the amount of habitat transformation/loss due to development). This is further discussed in Section 8.

7.1 Mitigation hierarchy

The principles of the mitigation hierarchy (Ekstrom et al., 2015; Mitigation hierarchy guideline draft February 2023)) are applied during an impact assessment. Potential impacts on biodiversity are preferentially managed through preventative, rather than remediative, measures (Figure 17). This is achieved by suggesting avoidance or minimization methods wherever possible. Successive steps in the hierarchy should only be considered once the previous step has been exhausted. Avoidance of negative impacts is a priority. If the impacts of a development cannot be adequately managed through the preventative measures of avoidance and minimization, then restoration and, as a last resort, offsets or compensation are considered.

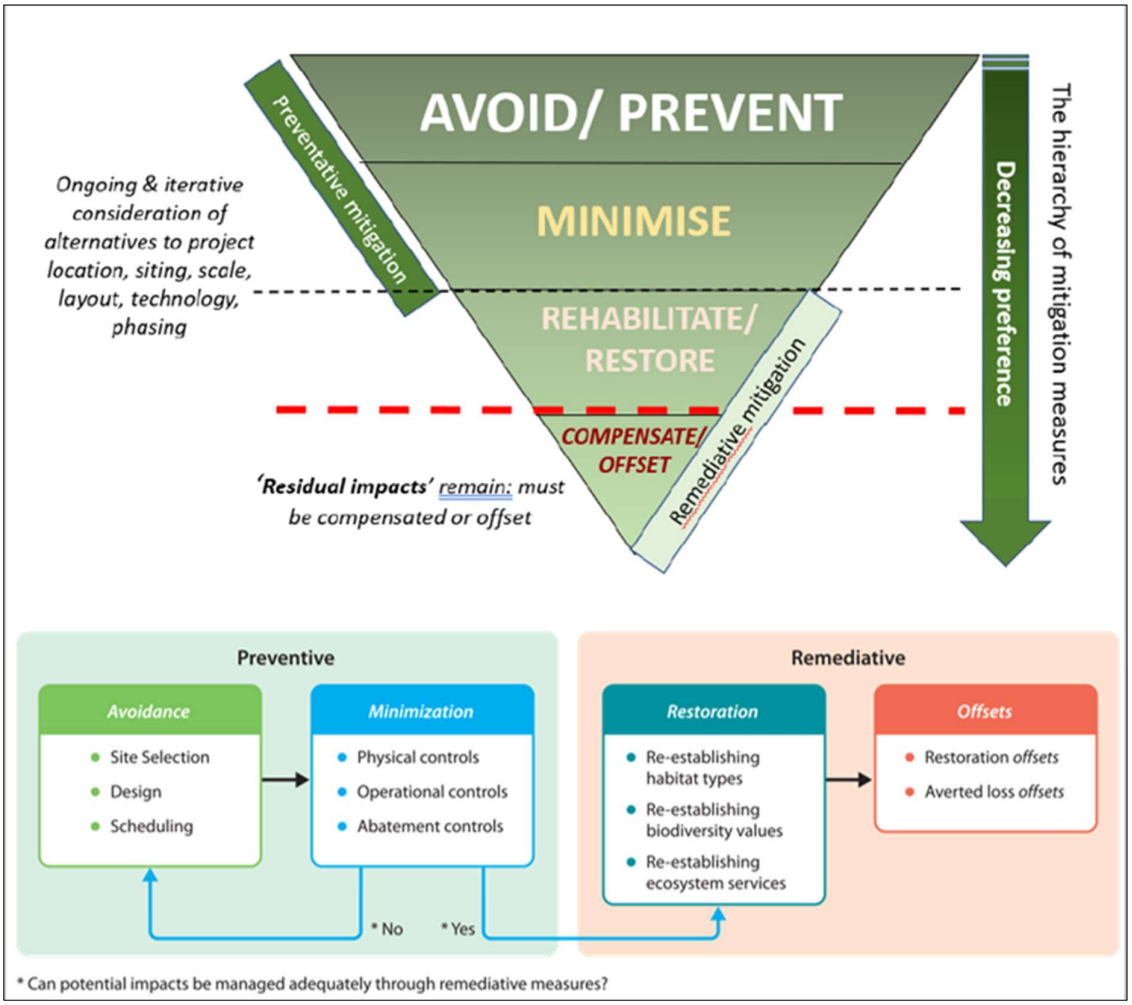

Figure 17. The iterative process of minimising predicted impacts on biodiversity and ecosystem services, as described in the mitigation hierarchy (Ekstrom et al., 2015; Mitigation hierarchy guideline draft, February 2023).

7.2 Reference to be made to Botanical Specialist report

Many impacts to fauna can be mitigated through minimizing impacts to the natural environment within which they occur. As such, many mitigation measures throughout this section address this aspect of 'habitat protection'. In addition to the measures highlighted throughout the next sections, it is imperative that the Botanical Specialist report (B. Fouche, Confluent Environmental) also be consulted, and these mitigation measures adhered to to reduce the impact of the development on plant species, since fauna rely heavily on plants for resources (food, shelter, etc.) and suitable habitat.

7.3 Project Area of Influence

The proposed development has some potential to have impacts outside of the development footprint. Indirect impacts such as noise and light may be increased at the site during the construction and operation phases, but the geographical extent of this indirect disturbance is difficult to quantify. Effects of noise are mitigated by the measures to be outlined in this impact assessment (Section 7.6.1 and Section 7.8.2) as are the effects of light (Section 7.8.2).
The potential direct disturbance footprint of construction of proposed roads and dwellings is included in the mitigation measures for this development (Section 7.6.2)

7.4 Current Impacts

Portion 76/216 Uitzigt Farm has remained undeveloped and largely unmodified from its natural state over the last 88 years. Nevertheless, some current impacts were observed on the site, which will continue if no mitigation and maintenance is considered for the property.

Current impacts observed on Portion 76/216 Uitzigt Farm include:

1. Low to moderate levels of alien plant invasions (Pine) in the north of the site resulting in the transformation of natural fynbos habitat. Habitat transformation from its natural state can impact fauna through altered fire regimes (increased frequency and intensity), loss of suitable habitat and usually a reduction in food resources (plants, prey species).
2. The gravel service road (Kerk Street) in the north of the property extends along the northern boundary – see SDPs) is currently unused and unmaintained. This may become a source of erosion on the property and a possible source area for the introduction of alien/invasive plants given its disturbed nature and possible degradation

over time. Whether through erosion or alien plant invasion, this could result in the transformation of natural fynbos habitat.

3. Moderate to high levels of alien plant invasion (Rooikrans: *Acacia cyclops*) in the dune valley/trough within the middle section of the property, resulting in the transformation of natural fynbos habitat.

It is highly recommended that the current impacts are addressed, and that an alien plant management plan be developed and implemented on the property before any development is permitted to take place. This pre-construction mitigation measure will benefit habitat quality and aid in reducing fire risk on the property as well as in the greater landscape.

7.5 Layout and design phase

While three SDPs have been put forward and are assessed within this report, there are some additional considerations within the layout and design phase of the project which can reduce the impact of the development on fauna and their habitat within the property.

1. Keep artificial lighting along roads and around infrastructure to a minimum and consider lighting colour, brightness and design options with minimal impact on biodiversity. This is particularly relevant to development within this largely natural area, where the potential for impacts on the native faunal diversity can be large. Light pollution is of global concern given that our night skies are getting lighter due to urban development and that many animals are specifically adapted to dark night skies for navigation, foraging and behavioural aspects (i.e. sleep, hunting). A common impact is that many insects are attracted to or disorientated by artificial lights, leading to aggregations at such point sources. This interferes with their natural behaviour (i.e. feeding), associated ecosystem services they provide (e.g. pollination) and often has fatal consequences for individuals unable to escape the ‘light trap’. There is also the cumulative impact of attracting predators to light sources (e.g. birds, frogs, small mammals) and exposing them to risks in these areas as well.
    a. Wherever possible in the designing phase consider ‘no lighting’ options to encourage dark areas and reduce light pollution.
    b. Where this is not possible, the impacts of lighting can be reduced through the selection of the colour/brightness (select yellow, dim lights which are less attractive to insects than bright white or blue lights) and design elements (lights facing down towards the ground rather than facing up towards the sky).
2. Consider self-reliant water, energy and other amenities if possible (i.e. use of solar power rather than power from the national grid that requires powerlines) to reduce

further impacts of infrastructure to be built on the site which results in additional habitat loss and impacts on biodiversity (e.g. birds colliding with power lines).

3. A strong emphasis should be placed on minimising the footprint of the development on this site and thereby limiting the loss of natural ecosystems, which benefits all SCC and biodiversity more widely. This can be done through changes in layouts and housing designs (build double storey rather than a single storey dwelling to minimise footprint, design a smaller dwellings, place dwelling on stilts to allow for natural vegetation to grow underneath and allow fauna to move underneath or use the under-dwelling area as a parking area negating the need for additional habitat loss for this purpose) as well as making use of nearby existing infrastructure (use an existing road on a neighbour's property and build shorter access roads to the dwellings branching off from this). Such layout changes can significantly reduce the development's footprint and significantly limit habitat loss to the benefit of all biodiversity. This should be given serious consideration for the development on Portion 76/216 Uitzigt Farm given the high SEI and animal sensitivities of the natural environment.
4. The proposed development will be situated within fynbos vegetation which is fire prone. Careful consideration should therefore be given to the placement of dwellings/infrastructure in relation to landscape/topographical features within the property to minimise fire risks (examples given in Figure 18). Currently, the dwelling in the north of the property is situated within a habitat containing alien vegetation that is more flammable and has a greater fire risk associated than natural fynbos. It is therefore highly recommended that alien plant eradication measures are implemented here before construction takes place, not only to benefit the natural environment but also to manage fire risk to this building. The dwelling in the south of the property is currently situated near the crest of a dune and is therefore also at great risk to fire damage as fires move upslope more readily than downslope to the trough/valley of dunes (Figure 18). Mitigation measures to reduce fire risks to this dwelling should therefore also seriously be considered in terms of design, for example: move the location of the southern dwelling to a safer area lower down the dune slope; use non-flammable materials for gutters and roofing (i.e. no plastic gutters or thatch roofing); plant a fire-proof hedge/vegetation around the dwelling (see Appendix 9). It is also imperative that a comprehensive fire management plan be developed and implemented on the property (i.e. planning and considerations for fire breaks, controlled burns).

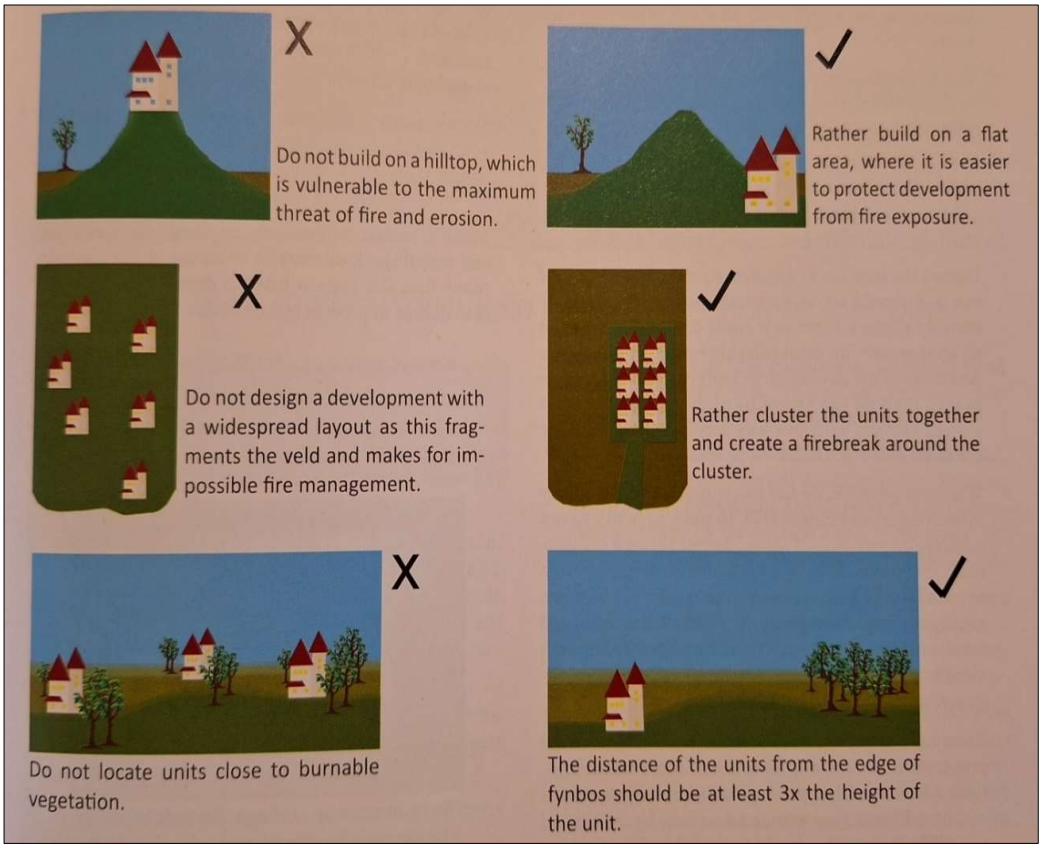

Figure 18. Considerations for dwelling placements when building in fire-prone habitats (Esler, Pierce and de Villiers 2014)

5. Access roads and parking spaces for non-heavy machinery could make use of open pavers that are planted with non-invasive grasses, like *Cynodon dactylon* (the Cape Royal variety), or *Stenotaphrum secundatum* (Buffalo grass). Open pavers should also be considered around any areas where water might be channelled and cause erosion around the dwellings (i.e. at the base of gutter outlets or overflow zones around water tanks). Open pavers reduce surface water runoff intensity through improved infiltration and can reduce erosion often associated with infrastructure (Figure 19).

Figure 19. Examples of open pavers to use for parking areas, access roads or underneath gutters/water tank overflow areas to improve water infiltration and prevent soil erosion.

7.6 Construction Phase Impacts

The construction phase will have the highest impacts on fauna species due to increased moving vehicles, noise and habitat destruction associated with these activities. It is imperative that an Environmental Control Officer (ECO) be appointed for the duration of the construction phase and ensure compliance with mitigation measures that aim to minimize impacts on fauna. It is imperative that an ECO is present on site at the onset of a new construction phase (see Section 7.6.4, mitigation measure 1), at the start of any earthworks, and twice a week thereafter during the construction phase.

7.6.1 Disturbance and deterrence of raptor SCC due to the noise.

Description: The faunal assessment revealed that the large area of natural fynbos habitat in the south of the property is possible breeding habitat, and ideal hunting grounds, for the endangered bird SCC (Black harrier *C. maurus*). This raptor breeds on the ground in fynbos habitat and is easily disturbed during its breeding season (June - November) which can result in the abandonment and failure of nests. The faunal site assessment took place during this SCC's breeding season (June – November), and while no SCC was found on site during this time, it is still possible that the SCC may be present during the time that construction occurs. No nests were found within the footprint or immediate vicinity of the planned roads or dwellings, but it is possible that nests may exist elsewhere on the property. Following the precautionary principle, this SCC is deemed present at the site and this impact is assessed.

Consequences of impact:

1. Construction related noise can disturb breeding raptors in the vicinity which can prevent them from selecting or returning to a site to breed on the property.
2. Construction related noise can result in SCC abandoning nests, eggs or chicks if breeding has already begun when construction commences.
3. If deterred from the area (temporarily or permanently), the SCC may not be able to find suitable alternative breeding habitat and skip a breeding season(s). This has negative consequence for the population growth and stability of an endangered species.
4. Reduction in Extent of Occurrence (EOO) of an SCC if it is deterred during breeding season and may not return for several years thereafter.

Impact Assessment

Impact Categories	Alternative 1		Alternative 2		Alternative 3	
	Without Mitigation	**With Mitigation**	**Without Mitigation**	**With Mitigation**	**Without Mitigation**	**With Mitigation**
Nature	Negative	Negative	Negative	Negative	Negative	Negative
Duration	Short term	Immediate	Short term	Immediate	Short term	Immediate
Extent	Local	Very limited	Local	Very limited	Local	Very limited
Intensity	Very high	Negligible	Very high	Negligible	Very high	Negligible
Probability	Likely	Highly unlikely / none	Likely	Highly unlikely / none	Likely	Highly unlikely / none
Significance	Minor - negative	Negligible - negative	Minor - negative	Negligible - negative	Minor - negative	Negligible - negative

Mitigation measures:

1. All construction related activities on the site are to occur outside the breeding season of the Black Harrier (*C. maurus*), with no construction related activities to occur from June – November.

7.6.2 Loss of Fynbos habitat for fauna due to construction related activities.

Description: The proposed development of one or two dwellings and associated access roads will result in the permanent loss of habitat space on the property. The primary development footprint where permanent infrastructure is placed and permanent loss of habitat occurs, translates to 2-3% (depending on SDP option in this report) of the natural habitat lost on the property.

Consequences of impact:

1. Habitat loss within an endangered fynbos habitat type.
2. Loss of suitable habitat for fauna SCC to live, forage and breed.
3. Loss of species with which SCC have obligatory relationships (i.e. host plants and ants for butterfly larva).

Impact Assessment

Impact Categories	Alternative 1		Alternative 2		Alternative 3	
	Without Mitigation	**With Mitigation**	**Without Mitigation**	**With Mitigation**	**Without Mitigation**	**With Mitigation**
Nature	Negative	Negative	Negative	Negative	Negative	Negative
Duration	Permanent	Permanent	Permanent	Permanent	Permanent	Permanent
Extent	Very Limited	Very limited	Very Limited	Very limited	Very Limited	Very limited
Intensity	High	Low	High	Low	High	Low
Probability	Certain / definite	Unlikely	Certain / definite	Unlikely	Certain / definite	Unlikely
Significance	Moderate - negative	Negligible - negative	Moderate - negative	Negligible - negative	Moderate - negative	Negligible - negative

Mitigation measures:

1. Prior to construction, the disturbance footprint of proposed roads and dwellings should be clearly defined and demarcated (2m beyond the final footprint is recommended) to prevent unnecessary additional damage to the surrounding environment:
    a. Construction netting or fencing must be used to clearly indicate construction areas (see example in Figure 20). Access roads must be clearly marked so there is no confusion as to where the tracks are or how wide the road is.
    b. Clear signs for “no-go” areas for vehicles and personnel should be placed strategically on the site and along access roads. No-go areas are anywhere outside of the direct area of influence of the construction phase.
    c. All vehicles, construction or inspection, must only access the dwelling sites via the planned, single track access roads as per the SDP (no additional roads, tracks to be made in the environment). These access roads are to be clearly marked to prevent drivers getting lost and creating additional tracks or

unnecessarily widening the access road. A turning area for construction vehicles should be demarcated within the existing footprint of the dwelling.

d. For any adhoc deliveries or visitors to site, clear signs on the nearby roads should be put up to guide drivers to the construction sites, thus avoiding divers getting lost and causing unnecessary damage to the environment.

Figure 20. Example of construction fencing to be used to demarcate construction areas.

2. Prior to construction, and once demarcated, the entire footprint area of the dwelling construction site and access roads needs to be assessed by a Botanical Specialist for the presence of butterfly larval host plants: *Aspalathus spp., Chrysanthemoides incana, C. monilifera, Indigofera erecta*[5], *Lebeckia plukenetiana, Osteospermum polygaloides*[5], *Thesium* spp[5], *Zygophyllum* spp.

    a. If located, a botanical specialist needs to oversee the transplanting of these species from the development footprint into an appropriate natural environment (outside the development footprint) closest to where the plant was originally found. By limiting the distance that the plant is moved from its original location, impacts on associated faunal communities and changes to its growing conditions (microclimate, soil texture, soil moisture) are reduced.

    b. Transplanting should follow best practice guidelines and on-going monitoring and maintenance (i.e. watering, temporary shading, etc.) of each transplanted plant needs to occur to ensure the best chances of survival. The new location

[5] Plant species identified on the property during 2023 Botanical Specialist survey (B. Fouche, Confluent Environmental)

of each plant needs to be marked (GPS point and a physical marker next to the plant) to allow the plant to be revisited for monitoring and maintenance purposes, which can cease once a Botanical Specialist considers the plant well established within its new environment.

3. Where vegetation will be cleared to make way for construction, filled sandbags, silt socks or a silt fence must be used to reduce the intensity of water runoff and flow over the site and thereby reduce erosion potential (Figure 21). This should be placed around the perimeter of the downslope disturbance footprint and needs regular inspection and adaptive management to ensure the integrity of the system for reducing erosion. This is pertinent for the dwelling in the south of the property against a slope of the dune where the risk of runoff is expected to be greatest.

Figure 21. Examples of silt socks (left) and a silt fence (right) placed perpendicular to the flow of water. These methods reduce the force of water flow, erosion and can prevent unwanted sedimentation a site.

4. Protection and reuse of topsoil can be critical for the success of rehabilitation of fynbos vegetation following construction processes as it contains valuable seedbank of indigenous plants that regenerate after the soil is replaced. Topsoil removed during construction should be treated with care for all the proposed developments on the property.

    a. Topsoil from fynbos vegetation on the site (excluding topsoil under dense stands of alien invasive plants) in new excavation areas must be stripped to a depth of 30cm, or in cases where the bedrock is shallower than this, then the entire soil layer is to be removed. Topsoil is to be kept in designated piles of maximum 1 m in height, to prevent anaerobic conditions from smothering seeds and rendering them inviable, and must be suitably covered with shade cloth (or

another breathable material with a fine mesh) to prevent any additional invasive species seeds from falling in and establishing in the soil.

b. If the SDP of a proposed development does not have enough space for the storage and protection of topsoil within the disturbance footprint, then the ECO must identify an alternative temporary stockpile area that is already transformed and where it can easily be retrieved for post-construction rehabilitation.

c. The topsoil piles must be clearly labelled so that it does not mix with subsoils excavated or any other construction material for the site.

7.6.3 Habitat and fauna negatively affected by the management of the construction site

Description: The management of materials and staff on the site is also an important impact of development. If managed properly, many accidents and unanticipated negative impacts on fauna and the surrounding environment can be avoided.

Consequences:

1. Loss of habitat or harm to fauna outside of designated construction areas.
2. Litter and pollution of natural environment.
3. Potential health and safety hazards (for staff and fauna) on the site and in the surrounding environment.

Impact Assessment

Impact Categories	Alternative 1		Alternative 2		Alternative 3	
	Without Mitigation	**With Mitigation**	**Without Mitigation**	**With Mitigation**	**Without Mitigation**	**With Mitigation**
Nature	Negative	Negative	Negative	Negative	Negative	Negative
Duration	Medium term	Immediate	Medium term	Immediate	Medium term	Immediate
Extent	Limited	Very limited	Limited	Very limited	Limited	Very limited
Intensity	High	Negligible	High	Negligible	High	Negligible
Probability	Almost certain / Highly probable	Highly unlikely / none	Almost certain / Highly probable	Highly unlikely / none	Almost certain / Highly probable	Highly unlikely / none
Significance	Minor - negative	Negligible - negative	Minor - negative	Negligible - negative	Minor - negative	Negligible - negative

Mitigation measures:

1. All new staff must be briefed about the layout of the construction site and must be made aware of the no-go areas as the surrounding environment is sensitive and must not be disturbed. Staff must be made aware what the Dungbeetle SCC looks like and to report all fauna occurring on site to the ECO. Weekly site meetings should be held, during which the ECO should remind all staff of these requirements and any questions/concerns can be raised and addressed.
2. Construction vehicles should be checked daily, prior to construction at the start of each day for leaks and other faults.
    a. Sandbags or sawdust should be available and accessible on the site to ensure that any accidental oil spills are contained and stopped quickly.
    b. Any contaminated soil on the site must be removed by a registered hazardous waste service provider (e.g. Spill Tech, Interwaste, EnviroServ., etc.).
    c. Vehicles with leaks and other problems are not allowed to operate on the site until they have been repaired.
3. No littering, waste dumping or burning is allowed on the site or in the surrounding environment. All waste is to be collected in designated bins with lids that can be secured or stored in a secure area when construction is not taking place (evenings, weekends, holidays, etc.) to prevent interference by animals (i.e. baboons). All waste is to be transported to a registered waste disposal facility off site.
4. Adequate ablution facilities must be provided for every construction project.
    a. Portable toilets will need to be used in remote areas like this site, and these must be placed on a level platform before construction starts within the footprint of the access roads or housing sites.
    b. Ablution facilities must be regularly maintained and cleaned.
    c. At least one toilet per ten to fifteen construction staff should be available – refer to SHEQ guidelines.
5. Concrete, cement, plastering, and painting:
    a. Mixing areas be clearly defined on the site and must be surrounded by an impermeable material (i.e. create a temporary coffer dam with sandbags and thick plastic sheeting) to prevent any runoff and absorption into the surrounding soils.

b. The designated mixing areas should be limited to areas that will become future hard surfaces on the site, or that are already transformed and likely to remain transformed.

c. No concrete and cement mixing is allowed in areas outside the site development plans (SDPs).

d. Cleaning of cement, plastering & paint equipment must be done into a designated, bunded & lined slurry sump or container to avoid contaminating the environment.

6. All stockpiles of fine textured building materials and soils must be covered by a geotextile or plastic covering, which must also be bunded (e.g. with sandbags) when not in use (Figure 22). This will prevent material being lost to the environment and fauna from accessing stockpiles and possibly subjecting them to harm during construction.

Figure 22. Stockpiles of fine textured building materials and soils covered with geotextile/plastic covering and bunded with sandbags when not in use.

7. Any small items or building materials which can be carried away by medium-large animals (i.e. baboons) should be safely stored in containers or locked away in a designated area to prevent interference from animals, causing possible harm to them and preventing them from removing such items from site.

8. All food waste (leftovers, bones, pips, apple cores) are to be disposed of in designated bins and NOT to be disposed of in the surrounding environment within or outside the designated construction areas. Food sources serve as a major attractant for fauna and

will expose them to unnecessary harm in the vicinity of the construction site. All food waste should be removed from site on a daily basis and disposed of appropriately.

9. Construction should take place during daylight hours so that the site can be adequately monitored for fauna during work hours, and also to prevent the use of artificial lighting at night which attracts many animal species (predominantly insects and associated predators) and subjects them to the risks of construction.

7.6.4 Harm/Death of fauna, particularly invertebrates and golden mole SCC.

Description: Fauna may occur on site and be killed or seriously harmed during construction related activities. Cryptic and ground-dwelling species, like the golden mole SCC, are difficult to detect and are limited in their mobility, as is the flightless dung beetle SCC, rendering them vulnerable to earthmoving and construction activities.

Consequences of impact:

1. Loss of threatened species and a shift towards a negative change in the conservation status of the SCC and other indigenous species affected by the development.
2. Loss of genetic diversity from remaining fauna populations.
3. General loss of biodiversity.

Impact Assessment

Impact Categories	Alternative 1		Alternative 2		Alternative 3	
	Without Mitigation	**With Mitigation**	**Without Mitigation**	**With Mitigation**	**Without Mitigation**	**With Mitigation**
Nature	Negative	Negative	Negative	Negative	Negative	Negative
Duration	Permanent	Immediate	Permanent	Immediate	Permanent	Immediate
Extent	Limited	Limited	Limited	Limited	Limited	Limited
Intensity	Very high	Very low	Very high	Very low	Very high	Very low
Probability	Almost certain / Highly probable	Rare / improbable	Almost certain / Highly probable	Rare / improbable	Almost certain / Highly probable	Rare / improbable
Significance	Moderate - negative	Negligible - negative	Moderate - negative	Negligible - negative	Moderate - negative	Negligible - negative

Mitigation measures:

1. Construction should happen in phases, such that construction related activities are confined to one area at a time on the property and can be monitored for faunal impacts appropriately. Suggested order for phases of construction should prioritize constructing access roads to completion before focusing on dwellings. As such the suggestion for alternative 3 is to construct the access to road to the northern dwelling, construct the northern dwelling to completion, then construct the access road to the southern dwelling where construction in the south may begin.
2. Prior to construction of a new phase/area:
    a. After the footprint of the development has been clearly demarcated as per Section 7.6.1 above, a Fauna Specialist should do a walk-through to look for signs of fauna with limited mobility and escape potential (i.e. tortoise, chameleon, etc.) with particular attention given to the Golden Moles and Flightless Dung Beetle SCC.
    b. Should signs of fauna with limited mobility or an SCC be found within the demarcated area, a search and rescue operation should be undertaken to relocate fauna to a suitable location on the property.
    c. No construction may commence until the Fauna Specialist is satisfied that all fauna with limited mobility and/or SCC have been successfully removed from the demarcated footprint area.
3. During construction:
    a. Before construction commences for any new earthworks at the start of new phase, an ECO should do a walk-through of the demarcated area and access roads that will be used to look fauna with limited mobility. These animals should be removed from the demarcated area to an adjacent location, and where appropriate a Fauna Specialist contacted for assistance or guidance. Construction/Earthworks for this new phase can commence thereafter.
    b. At any point during the day (during construction), if an animal with limited mobility (particular attention given to the Dung Beetle SCC) is observed on site, this should be reported to the ECO and construction temporarily halted. Construction can commence once the ECO is satisfied that all such fauna are removed from the construction area.
    c. Speed limits should be imposed and monitored during construction phase, as collisions with vehicles (roadkill) pose a significant threat to many fauna species. The development site falls within a large natural area, increasing connectivity and ultimately the diversity of fauna that may be encountered and

threatened by moving vehicles. Given the narrow access roads recommended for this development, speed limits should be restricted at the discretion of the ECO to appropriate speeds to allow for driver alertness and ability to avoid collisions with fauna. Recommended speeds include 40 km/hour on main access roads with good visibility into the road verges, and 20 km/hour on smaller access roads with narrow or overgrown verges where visibility is reduced. Signs should be put up along the roads to remind people of speed limits, as well as warnings to look out for small animals on the roads (see examples in Figure 23).

Figure 23. Road sign reminding drivers to look out for dung beetles (left) and tortoises (tight). Can be applied to all sensitive fauna.

7.7 Conclusion of construction phase

The conclusion of any project is an essential, but often overlooked aspect of projects. This relates primarily to the cleaning up of the site once construction has concluded.

1. Construction sites must be cleared of all waste material, rubble, and debris associated with the construction phase at regular intervals during, and at the conclusion of the construction phase.
2. Revegetation of bare soil following construction is an essential part of concluding the construction phase of the project. This should be done with indigenous plant species that occur naturally in the surrounding environment on the property (examples are given in Appendix 9).
3. All drainage structures must be checked to ensure that there are no blockages or pollution that is blocking the free flow of water over the site; these checks will prevent

erosion during and after the construction phase that could have potentially far-reaching implications beyond the footprint for the proposed development.

7.8 Operational Phase Impacts

7.8.1 Loss of fynbos habitat for fauna during maintenance activities.

Description: The development on the site will alter the disturbance regime of the large natural area on the property through changes in fire regimes and vegetation clearing associated with the maintenance and operation of housing and road infrastructure. For the most part, disturbances and habitat loss/alterations will be restricted to the immediate surroundings of the roads (i.e. road verge clearing) and dwellings (i.e. fire breaks) but some large-scale disturbances may alter the property's habitat as a whole (i.e. changes in fire regimes).

If the management adopts ecologically friendly approaches in the long-term, the development can have many positive (rather than only negative) outcomes for the environment. For example, the removal of the alien plants on site and the active control thereof reduces a significant existing threat to the fynbos habitat on site and in the surrounding environment i.e. increase in natural habitat, reducing the risk of fires (reduced frequency and intensity). The owner of the property will need to develop an alien invasive management and eradication plan, as well as a fire management plan.

Consequences of impact:

1. A general loss of habitat for plants and fauna by vegetation clearing around dwellings and roads. The mismanagement of materials during routine maintenance of infrastructure can also cause habitat loss (i.e. stockpiling/long term storage of materials on site rather than removing from site).
2. Changes in habitat structure through changes in fire regimes on the property i.e. suppressing fire over a prolonged period can lead to species poor senescent fynbos habitat.
3. Uncontrolled alien plants can completely invade and transform natural habitats leading to a loss in associated biodiversity. Alien plants also increase fire frequency and intensity, which negatively impacts biodiversity either directly through hotter more frequent fires, or indirectly though changes in habitat (vegetation) structure.

Impact Assessment

Impact Categories	Alternative 1		Alternative 2		Alternative 3	
	Without Mitigation	**With Mitigation**	**Without Mitigation**	**With Mitigation**	**Without Mitigation**	**With Mitigation**
Nature	Negative	Negative	Negative	Negative	Negative	Negative
Duration	Permanent	Short term	Permanent	Short term	Permanent	Short term
Extent	Local	Very limited	Local	Very limited	Local	Very limited
Intensity	High	Low	High	Low	High	Low
Probability	Certain / definite	Unlikely	Certain / definite	Unlikely	Certain / definite	Unlikely
Significance	Moderate - negative	Negligible - negative	Moderate - negative	Negligible - negative	Moderate - negative	Negligible - negative

Mitigation measures:

1. Vegetation clearing along road verges should be kept to a minimum, and avoided in areas where it poses no risk to vehicles. Where essential, vegetation along the road verges should only be cleared up to a maximum width of 1m on either side of the road. Cut vegetation should not be consolidated (gathered into piles) and left next to the side of the road where clearing took place. Instead, the cut vegetation should either be removed from site, or disposed of in a scattered/spread-out manner within the immediate surrounding of where it was cut, so as not to smother other plants or create concentrated fuel loads for fire.
2. During routine maintenance of infrastructure on the property, adequate management of materials should be implemented to reduce any unnecessary habitat loss. For example, all new building materials should be stored in areas within the disturbance footprint of the developments as far as possible to reduce additional damage to the natural (undisturbed) surroundings. Any old/removed building materials or rubble should be removed from site as soon as possible during maintenance activities and disposed of appropriately off-site. This will reduce the amount of additional space (natural surrounding habitat) lost or damaged for unnecessary storage of materials (Figure 24).

Figure 24. Inappropriate disposal or storage of pavers used during road maintenance activities.

3. It is a requirement by law than an alien and invasive plant management plan be developed and implemented on the property – see Botanical Specialist Report by B. Fouche (Confluent Environmental) for details, and refer to the National Environmental Management: Biodiversity Act (NEMBA, Act No. 10 of 2004) and the Conservation of Agricultural Resources Act (CARA, Act No. 43 of 1983).
4. A fire management plan can greatly aid in managing fire risks, with controlled, planned burns effectively promoting biodiversity and preventing damage to infrastructure. It is also highly recommended that property owners join a local Fire Protection Association (as advised by the National Veld and Forest Fires Act No. 101 of 1998), which aids in sound fire management protocols and can have insurance benefits through removing the presumption of guilt through negligence in the event of a fire spreading to neighbouring properties.
5. No insect zappers should be allowed on site, nor the general application of insecticides around infrastructure. Ecofriendly repellents are readily available (i.e. citronella oil/lotions) and should be used instead.
6. Emergency & cleaning supplies for waste spillage or fires should be accessible at each development proposed development on the property (e.g., keep lime, spades, first aid, fire extinguishers, etc. handy). Rainwater tanks can also be a useful source of water to aid in extinguishing fires, provided the water is readily accessible.
7. All staff and guests to the property must be properly trained and made aware of activities that are not allowed on the property.

8. Limited additional vegetation clearing should take place on the property for activities, even if these are low impact, as the cumulative effects can be substantial (i.e. camping grounds, mountain biking/hiking trails, picnic areas).
9. The establishment of indigenous gardens or the complete absence of gardens (i.e. fully rehabilitating any disturbed areas) within the footprints of the development will promote natural biodiversity. It is also highly recommended that indigenous, locally occurring, fire resistant vegetation be planted around the dwelling to aid in protecting buildings in the event of a fire (i.e. some indigenous species can be planted to form a fire-proof hedge). Some commercially available indigenous plant species that were also found on the property (locally occurring), including some to be used as part of fire-proof hedges, are suggested in Appendix 9.

7.8.2 Disturbance of fauna due to noise and lighting associated with residential units.

Description: The development on the site will alter the disturbance regime of the largely natural area on the property through changes in noise and artificial lighting levels. For the most part, these disturbances will be restricted to the immediate surroundings of the roads (i.e. traffic noise) and dwellings (i.e. people talking/shouting, music). However, this can have a significant impact on biodiversity and alter the way fauna use the landscape (i.e. the creation of a landscape of fear resulting in animals avoiding certain habitats/areas around human disturbances; insects attracted to lights decreases their survival, negatively impacts on the ecosystem services they provide and has negative knock-on consequences for their associate predators).

Consequences of impact:

1. The creation of a landscape of fear for fauna where areas of the property are avoided due to excessive anthropogenic activity, predominantly noise.
2. Light pollution, as discussed in Layout and Design Phase 7.5 above, acts as an attractant to many insects and associated predators, putting all at risk.

Impact Assessment

Impact Categories	Alternative 1		Alternative 2		Alternative 3	
	Without Mitigation	**With Mitigation**	**Without Mitigation**	**With Mitigation**	**Without Mitigation**	**With Mitigation**
Nature	Negative	Negative	Negative	Negative	Negative	Negative
Duration	Permanent	Brief	Permanent	Brief	Permanent	Brief
Extent	Very limited	Very limited	Very limited	Very limited	Very limited	Very limited

Intensity	High	Very low	Moderate	Very low	High	Very low
Probability	Almost certain / Highly probable	Almost certain / Highly probable	Almost certain / Highly probable	Almost certain / Highly probable	Almost certain / Highly probable	Almost certain / Highly probable
Significance	Moderate - negative	Negligible - negative	Moderate - negative	Negligible - negative	Moderate - negative	Negligible - negative

*Instance where Alternative 2 differs from Alternatives 1 and 3 in red

Mitigation measures:

1. Light pollution must be reduced and avoided wherever possible during the operational phase of the project. White LED lights have the worst negative effects for the environment, therefore dimmer lights with more natural warm light colours must be used, and no bright torches used outside the dwelling at night unnecessarily.
2. Permanent lighting along roads must be avoided. Given the low traffic volumes expected for this development, road-side lighting along the access roads is unnecessary and will cause avoidable impacts on biodiversity, particularly increasing the risk of roadkill.
3. Noise should be minimised on the site and loud sirens/alarms should not be permitted unless there is an emergency. If security is a concern, then a silent alarm system should be implemented i.e. motion detection cameras.

7.8.3 Human-wildlife conflict

Description: Some wild animals are attracted to human developments, usually due to the presence of a resource that has become available within the footprint of the development (i.e. food attracting baboons, leftover scraps attracting wild animals if disposed in the surrounding environment). If any animal becomes habituated or loses their fear of humans, they risk becoming pests and problem animals (sometimes even posing a risk to humans) and often require control, in severe cases resulting in their harm or death. Keeping pets on the premises can also increase the potential for human-wildlife conflict as pets can fight or kill animals (i.e. cats are known to be devastating for indigenous wildlife, especially birds, small mammals and reptiles), or be attractive to some animals as prey (i.e. leopard are known to take domestic cats and dogs occasionally). Pets also run the risk of being harmed by wildlife (i.e. snake bites) which can lead to owners wanting to control or harm the natural fauna of the area.

Consequences of impact:

1. Intentional harm or death of problem or pest animals due to their negative effects on the people (or pets) living on the property.
2. Unintentional harm or death of animals due to them consuming waste/food products which are bad for their health.
3. Pets causing death/harm to indigenous wildlife.
4. Changes in natural foraging and movement patterns of fauna across habitats within the landscape due to the presence of a favourable resource (usually food) near the development. This can have knock-on effects for the ecosystem services they provide and their associated predators.

Impact Assessment

Impact Categories	Alternative 1		Alternative 2		Alternative 3	
	Without Mitigation	**With Mitigation**	**Without Mitigation**	**With Mitigation**	**Without Mitigation**	**With Mitigation**
Nature	Negative	Negative	Negative	Negative	Negative	Negative
Duration	Permanent	Brief	Permanent	Brief	Permanent	Brief
Extent	Local	Very limited	Local	Very limited	Local	Very limited
Intensity	Very high	Negligible	Very high	Negligible	Very high	Negligible
Probability	Almost certain / Highly probable	Rare / improbable	Almost certain / Highly probable	Rare / improbable	Almost certain / Highly probable	Rare / improbable
Significance	Moderate - negative	Negligible - negative	Moderate - negative	Negligible - negative	Moderate - negative	Negligible - negative

Mitigation measures:

1. No feeding of wildlife is permitted, and no disposal/discarding of any food waste (bones, scraps, fruit pips/cores) within the surrounding environment is allowed.
2. All food waste or general waste should be kept in a secure location (i.e. a lockup cage or sealed outside room) which is not accessible to any wildlife.
3. All waste should be stored in a double-container fashion, in such a way that it does not serve as an attractant to wildlife attempting to access the secure location (i.e. all waste products put into closed/sealed rubbish bags/containers and then placed within larger sealed containers/bins).
4. Given that the waste area is secured against wildlife accessing it, allowances should still be made for the unlikely event that an animal does access the waste storage area,

so that the waste is not easily accessed (i.e. use wildlife-proof dustbins/containers or lock the lids of larger containers). The double-container storage of waste (mentioned above) also prevents easy access of waste products to fauna, with all rubbish bags to be stored inside more solid containers. Examples of wildlife-proof bins are suggested in Figure 25.

5. All waste, particularly food waste, should be regularly removed from the property and disposed of appropriately to prevent the scent of old products increasing the attractiveness to the disposal area and surrounding development for wildlife.
6. Residents on the property should be limited in their ability to keep pets (i.e. how many pets and what types of pets). It is highly recommended that no cats be allowed on the property as they are known to actively hunt small animals and can have detrimental effects on the wildlife of an area (see Figure 26).

Figure 25. Wildlife-proof garbage disposal container options. Large containers with a one-way shoot to dispose of garbage (left): the top lid is connected to a smaller container which swivels up when the lid is opened to block access to the larger bin and its contents below, but when the lid is closed this bin swivels down to drop the garbage into the larger container. Locking mechanisms and handles on bins (middle and right) can also be used to successfully keep wildlife out.

Figure 26. Animals killed by one house cat in one year. Article published in National Geographic (https://www.nationalgeographic.co.uk/animals/2020/09/the-232-animals-in-this-photo-were-killed-by-house-cats-in-just-one-year).

7.8.4 Harm/Death to wildlife due to collisions with vehicles.

Description: All fauna (from butterflies to large mammals) run the risk of being seriously harmed or killed due to collisions with vehicles on road infrastructure. The Endangered Wildlife Trust (EWT) has an entire programme aimed at tracking the impacts of roadkill and monitoring the effectiveness of various mitigation measures (https://ewt.org.za/what-we-do/saving-species/wildlife-and-transport/), illustrating the severity of this impact on fauna. Roadkill can be particularly detrimental to populations of threatened species within an area (i.e. putting them at risk of local extinction) and to animals with limited mobility which are at a higher risk of injury or death due to their limited ability to escape moving vehicles. The consequences of this impact is likely to be higher for Alternative 1 and Alternative 3 due to the longer stretch of new road proposed in these development plans.

Consequences of impact:

1. Death/Harm to any animal species (small insects to larger mammals) as a result of collisions with vehicles, particularly animals with limited mobility.

2. Decline in population size of local fauna populations, particularly that of threatened species (i.e. listed as vulnerable or endangered, etc.) which may increase their conservation status or risk of extinction.

Impact Assessment

Impact Categories	Alternative 1		Alternative 2		Alternative 3	
	Without Mitigation	**With Mitigation**	**Without Mitigation**	**With Mitigation**	**Without Mitigation**	**With Mitigation**
Nature	Negative	Negative	Negative	Negative	Negative	Negative
Duration	Permanent	Brief	Short term	Brief	Permanent	Brief
Extent	Limited	Very limited	Limited	Very limited	Limited	Very limited
Intensity	Very high	Very low	Moderate	Very low	Very high	Very low
Probability	Almost certain / Highly probable	Unlikely	Almost certain / Highly probable	Unlikely	Almost certain / Highly probable	Unlikely
Significance	Moderate - negative	Negligible - negative	Moderate - negative	Negligible - negative	Moderate - negative	Negligible - negative

*Instances where Alternative 2 differs from Alternatives 1 and 3 in red

Mitigation measures:

1. Limit driving at night when driver visibility and vigilance is reduced. Some animals are also blinded by the lights of a car, which reduces their ability to escape from collisions.
2. The strict enforcement of speed limits along all roads on the property. This speed limit should be reduced in areas where road-side visibility is reduced (i.e. due to dense vegetation). Speedbumps or other speed reducing techniques can be incorporated into the road design to assist in keeping speeds to a minimum.
3. In areas where there is dense vegetation along the road verges, consideration should be given to clearing a narrow road margin (i.e. maximum of 1m on each side of road). In addition to a speed limit, this can assist in preventing roadkill by improving the driver's ability to see an animal before it appears on the road and have adequate response time (through the implementation of a speed limit) to avoid collisions. However, vegetation clearing for this purpose needs to be balanced with the amount of habitat lost due to this activity (see also Impact 7.6.2 above).

8. DISCUSSION AND CONCLUSION

Portion 76/216 Uitzigt Farm is a largely undeveloped property with minimal historic or current disturbances. It also forms part of a larger natural area within the greater landscape and is suitable habitat for many fauna SCC. The site ecological importance (SEI) across the property (excluding only some areas in the dune valleys invaded by alien plants) was determined to be 'High'. As such, the proposed development of residential dwelling(s) spaced out across the property and a road could be considered a suitable land use for the property from a terrestrial fauna perspective, as the anticipated activities are expected to be limited and low impact (see also Table 9), provided the mitigation measures outlined in this report are strictly adhered to.

A key feature guiding development in 'High' SEI areas, as per the Species Environmental Assessment Guidelines (SANBI 2020), is that the development should avoid additional habitat loss and limit the amount of habitat impacted wherever possible. The site falls within a CBA1 area, for which the WCBSP also recommends only low-impact, biodiversity-sensitive land uses with limited to no habitat loss (Table 2). As such, it is strongly recommended that the new north- south access road zig-zagging across the property not be developed, and instead that the shorter direct access road stemming from the existing access road on the neighbouring property to the west be followed. This will reduce the amount of habitat lost due to road infrastructure on the property and allows for the preventative measures (avoidance and minimization) of the mitigation hierarchy to be implemented (see Figure 17). For the same reasons it is also recommended that the building in the south be the only one built on the property. It is, however, noted that construction of the dwelling in the north rather than the south would have the lowest impact given that it is located in lower sensitivity habitat, and would not require the additional road (A possible fourth Alternative SDP which would have the lowest impact of all). Consideration should also be given to the swimming pool proposed for the southern dwelling regarding the source of the water, whether it is chlorinated, and the effect spillage and backwash into the environment. This can influence the environment, habitats, and therefore wildlife. Additional considerations should seriously be considered in terms of dwelling design and size, especially for the larger dwelling in the south, to minimize the development footprint and further reduce the amount of habitat lost to this development. Some suggestions for layout improvements are provided under Section 7.5 in this report to minimize a housing footprint.

It is highly recommended that if this development were approved, that the property limits any additional development and habitat loss in the future, in accordance with recommendations from both the High SEI rating as well as the CBA1 mapped area of the site. Protecting natural habitat is one of the best ways to protect indigenous fauna, particularly those with a high

conservation status (i.e. at greater risk of extinction). Given its mostly natural state and high connectivity to a greater natural area in the surroundings, this property should make habitat conservation a priority. While already mapped as being included within the Garden Route Biosphere Reserve and Knysna National Lake Area protected areas, owners can protect the property more formally through entering into agreements with the existing protected areas the vicinity (e.g. stewardship programs). It is also recommended that all alien invasive plant species on the site be actively managed through the development and implementation of alien invasive plant management plan, as this will limit current negative impacts on the property and the surrounding areas and increase natural fynbos habitat.

It is the specialist's opinion that this development, provided that all mitigation measures are strictly adhered to, will cause minimal habitat loss and disturbance to fauna on the property. However, habitat loss can be further reduced on the site through additional minimizations of all footprints (dwellings and roads). This is considered a favourable land use for this property, which under the current SDPs (especially the preferred SDP Alternative 2) can maintain its landscape connectivity and large natural spaces, provided that limited to no additional developments take place in future. Having a presence on the property (i.e. landowner living on the site) can also have a positive impact on the maintenance of the property, such that alien plants can be actively managed and fire management plans implemented. These positive maintenance activities can improve biodiversity on the property and have benefits at a landscape scale as well, particularly when they promote the existence of fauna SCC and their associated habitats.

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APPENDIX 1: SCC IDENTIFIED FROM PUBLIC PLATFORMS FOR THE PROJECT AREA.

SCC were included or excluded from further analysis in this report based on expert interpretation for the presence/absence of key landscape and habitat features on site. See Section 4.2 Assumptions and Limitations for more information.

Species	Common name	Regional Assessment	Source	Assessed
Avifauna				
Alcedo semitorquata	Half-collared Kingfisher	Near Threatened	Virtual Museum	No
Ardenna grisea	Sooty Shearwater	Near Threatened	Virtual Museum	No
Bradypterus sylvaticus	Knysna Warbler	Vulnerable	Virtual Museum	Yes
Buteo trizonatus	Forest Buzzard	Least Concern (Globally Near Threatened)	iNaturalist	Yes
Calidris ferruginea	Curlew Sandpiper	Least Concern (Globally Near Threatened)	Virtual Museum	No
Campethera notata	Knysna Woodpecker	Near Threatened	iNaturalist	Yes
Circus maurus	Black Harrier	Endangered	Virtual Museum	Yes
Circus ranivorus	African Marsh Harrier	Endangered	Virtual Museum	Yes
Coracias garrulus	European Roller	Near Threatened	iNaturalist	No
Crithagra leucoptera	Protea Canary (Seedeater)	Near Threatened	Virtual Museum	No
Falco biarmicus	Lanner Falcon	Vulnerable	Virtual Museum	Yes
Grus paradisea	Blue Crane	Near Threatened	Virtual Museum	Yes
Hydroprogne caspia	Caspian Tern	Vulnerable	Virtual Museum	No
Leptoptilos crumenifer	Marabou Stork	Near Threatened	Virtual Museum	No
Limosa lapponica	Bar-tailed Godwit	Least Concern (Globally Near Threatened)	Virtual Museum	No

Species	Common name	Regional Assessment	Source	Assessed
Morus capensis	Cape Gannet	Vulnerable	Virtual Museum	No
Numenius arquata	Eurasian Curlew	Near Threatened	Virtual Museum	No
Oxyura maccoa	Maccoa Duck	Near Threatened	Virtual Museum	No
Phalacrocorax capensis	Cape Cormorant	Endangered	Virtual Museum	No
Phoenicopterus roseus	Greater Flamingo	Near Threatened	Virtual Museum	No
Polemaetus bellicosus	Martial Eagle	Endangered	Virtual Museum	Yes
Procellaria aequinoctialis	White-chinned Petrel	Vulnerable	Virtual Museum	No
Spheniscus demersus	African Penguin	Endangered	Virtual Museum	No
Stephanoaetus coronatus	Crowned Eagle	Vulnerable	Virtual Museum	Yes
Stercorarius antarcticus	Subantarctic (Brown) Skua	Endangered	Virtual Museum	No
Thalassarche cauta	Shy Albatross	Near Threatened	iNaturalist	No
Mammals				
Amblysomus corriae	Fynbos Golden Mole	Near Threatened	Virtual Museum	Yes
Aonyx capensis	African Clawless Otter	Near Threatened	Virtual Museum	No
Chlorotalpa duthieae	Duthie's Golden Mole	Vulnerable	Virtual Museum	Yes
Damaliscus pygargus pygargus	Bontebok	Vulnerable	Virtual Museum	No
Leptailurus serval	Serval	Near Threatened	Virtual Museum	Yes
Myosorex longicaudatus	Long-tailed Forest Shrew	Endangered	Virtual Museum	No
Panthera pardus	Leopard	Vulnerable	Virtual Museum	Yes
Philantomba monticola	Blue Duiker	Vulnerable	Virtual Museum	Yes

Species	Common name	Regional Assessment	Source	Assessed
Poecilogale albinucha	African Striped Weasel	Near Threatened	Virtual Museum	Yes
Invertebrates				
Aloeides pallida littoralis	Knysna Pale Copper	Near Threatened	Virtual Museum	Yes
Aloeides thyra orientis	Eastern Red Copper	Endangered	iNaturalist	Yes
Chrysoritis thysbe mithras	Brenton Sparkling Opal	Critically Endangered	Virtual Museum	Yes
Circellium bacchus	Flightless dung beetle	Vulnerable	iNaturalist	Yes
Ecchlorolestes nylephtha	Queen Malachite	Near Threatened	Virtual Museum	No
Orachrysops niobe	Brenton-bloutjie	Critically Endangered	Virtual Museum	Yes
Spesbona angusta	Ceres Featherlegs	Endangered	Virtual Museum	No
Thestor brachycerus brachycerus	Strand-Skollie	Critically Endangered	Virtual Museum	Yes
Amphibians				
Afrixalus knysnae	Knysna Banana Frog	Endangered	Virtual Museum	Yes

APPENDIX 2: AVIFAUNA SPECIES OBSERVED DURING SITE VISIT TO PORTION 76/216 UITZIGT FARM

Common name	Scientific name
Black Saw-wing	*Psalidoprocne pristoptera*
Cape Bulbul	*Pycnonotus capensis*
Cape Robin-Chat	*Cossypha caffra*
Cape Spurfowl	*Pternistis capensis*
Cape Turtle (Ring-necked) Dove	*Streptopelia capicola*
Cape White-eye	*Zosterops virens*
Grey Heron	*Ardea cinerea*
Jackal Buzzard	*Buteo rufofuscus*
Karoo Prinia	*Prinia maculosa*
Kelp Gull	*Larus dominicanus*

Common name	Scientific name
Malachite Sunbird	*Nectarinia famosa*
Neddicky	*Cisticola fulvicapilla*
Olive Thrush	*Turdus olivaceus*
Red-eyed Dove	*Streptopelia semitorquata*
Sombre Greenbul	*Andropadus importunus*
Southern Boubou	*Laniarius ferrugineus*
Southern Fiscal	*Lanius collaris*
Western Cattle Egret	*Bubulcus ibis*

APPENDIX 3: MAMMAL SPECIES OBSERVED DURING SITE VISITS TO PORTION 76/216 UITZIGT FARM

Order	Family	Common name	Scientific name	Notes
Artiodactyla	Bovidae	Southern Bushbuck	*Tragelaphus sylvaticus*	Identified from camera trap video
Artiodactyla	Bovidae	Grysbok	*Raphicerus melanotis*	Suspected species from dung identification
Primates	Cercopithecidae	Chacma baboon	*Papio ursinus*	Suspected species from dung identification
Rodentia	Bathyergidae	Mole-rat	-	Suspected species from mole hills
Rodentia	Hystricidae	Porcupine	*Hystrix africaeaustralis*	Suspected species from dung identification

APPENDIX 4: INVERTEBRATE SPECIES OBSERVED DURING SITE VISITS TO PORTION 76/216 UITZIGT FARM

Species of Conservation Concern are indicated in red text.

Order	Family	Common name	Scientific name
Araneae	Thomisidae	Avelis Crab Spider	*Avelis hystriculus*
Coleoptera	Scarabaeidae	Cape Flightless Dung Beetle	*Circellium bacchus*
Coleoptera	Scarabaeidae	Monkey Beetle	-
Diplopoda (Class)	Oniscomorpha (Superorder)	Pill Millipede	-
Hemiptera	Pentatomidae	Antestia Bug	*Antestiopsis thunbergii*
Hymenoptera	Apidae	Honey Bee	*Apis mellifera*

Order	Family	Common name	Scientific name
Hymenoptera	Formicidae	Carpenter Ant	*Camponotus sp.*
Hymenoptera	Formicidae	Cocktail Ants	*Crematogaster peringueyi*
Lepidoptera	Lycaenidae	Bronze Butterfly	*Cacyreus sp.*
Lepidoptera	Lycaenidae	Eastern Water Opal Butterfly	*Chrysoritis palmus margueritae*
Lepidoptera	Nymphalidae	Painted Lady Butterfly	*Vanessa cardui*
Lepidoptera	Pieridae	Brown-Veined White / African Veined White	*Belenois sp.*
Lepidoptera	Pieridae	Meadow White Butterfly	*Pontia helice*
Lepidoptera	Saturniidae	Pine Emperor Butterfly	*Nudaurelia cytherea*
Lepidoptera	Sphingidae	Hawk Moth	-
Orthoptera	Acrididae	Grasshopper	*Orthochtha dasycnemis*

APPENDIX 5: REPTILE SPECIES OBSERVED DURING SITE VISITS TO PORTION 76/216 UITZIGT FARM

Order	Family	Common name	Scientific name
Testudines	Testudinidae	Angulate Tortoise	*Chersina angulata*

APPENDIX 6: SITE ECOLOGICAL IMPORTANCE METHODS

The site ecological importance (SEI) is defined and calculated as highlighted as per the Species Environmental Assessment Guideline (SANBI 2020), where SEI is a function of biodiversity importance (BI) and receptor resilience (RR) such that: SEI = BI + RR.

BI is further defined as a function of conservation importance (CI) and habitat functional integrity (FI), with BI = CI + FI, and is determined by means of a matrix (Table 10).

SEI can therefore be fully understood as SEI = (CI + FI) + RR, where:

Conservation Importance (CI): 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. *Most features included in CI are provided by the screening tool but are evaluated at a finer scale following field work at the site.

Functional Integrity (FI): A measure of the ecological condition of the impact receptor (i.e., habitat type) as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts.

Receptor Resilience (RR): The intrinsic capacity of the receptor (i.e., habitat type or SCC) to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention.

Table 10. Matrix to calculate the biodiversity importance (BI) of a given habitat type identified from desktop and field assessments.

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

The SEI is derived for each habitat type or SCC within a project site by making use of two matrixes: first to calculate the BI (using Table 10) and then the SEI (Table 11).

SEI is therefore specific to the proposed development and can only be compared between alternative layouts for the same proposed development, but not between different developments.

Table 11. Matrix to calculate site ecological importance (SEI) of a given habitat type identified from desktop and field assessments.

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

APPENDIX 7: ENVIRONMENTAL COMPLIANCE OFFICER (ECO) CHECKLIST FOR FAUNA MITIGATION MEASURES DURING PRECONSTRUCTION, CONSTRUCTION AND THE CONCLUSION OF CONSTRUCTION PHASES OF DEVELOPMENT.

While this checklist is designed to assist ECOs in compliance monitoring, it is a summary only and it is imperative that the details of each mitigation measure are read, fully understood and implemented as described in the text of this report. The relevant impact and full details of methods to be followed for each mitigation measure are listed in the table below.

Mitigation measure	Relevant impact; details of methods	Checklist √
Pre-construction phase:		
No construction activities to occur between 01 June – 30 November.	See Section 7.5.1; Mitigation measure 1.	
The footprint of proposed roads and dwellings should be clearly defined and demarcated.	See Section 7.5.2; Mitigation measure 1.	
Botanical Specialist to assess the demarcated footprint of development to search for (and rescue) any butterfly host plant species before construction commences.	See Section 7.5.2; Mitigation measure 2.	
Construction to happen in phases, such that all activities are confined to one area at a time on the property. A plan should be developed and communicated to all staff as to which construction phase is currently underway, and which areas are therefore off-limits until further notice.	See Section 7.5.4; Mitigation measure 1.	
Before a new construction phase commences, a Fauna Specialist must do a walk-through of the demarcated development footprint. No construction may commence until the Fauna Specialist is satisfied	See Section 7.5.4;	

Mitigation measure	Relevant impact; details of methods	Checklist √
that all fauna with limited mobility and/or SCC have been successfully removed from the demarcated footprint area.	Mitigation measure 2.	
Construction phase:		
No construction activities to occur between 01 June – 30 November.	See Section 7.5.1; Mitigation measure 1.	
Where vegetation will be cleared during construction, erosion control measures need to be put in place downslope of disturbance footprint.	See Section 7.5.2; Mitigation measure 3.	
Topsoil removed during construction, treated with care and stored appropriately for future use and rehabilitation purposes.	See Section 7.5.2; Mitigation measure 4.	
Regular staff orientation and information sessions.	See Section 7.5.3; Mitigation measure 1.	
Check construction vehicles on a daily basis (prior to the commencement of operations) for leaks and other faults.	See Section 7.5.3; Mitigation measure 2.	
Implement appropriate waste management, storage and disposal to minimize pollution on site and in surrounding natural areas.	See Section 7.5.3; Mitigation measure 3.	
Provision, cleaning and maintenance of adequate ablution facilities on site.	See Section 7.5.3;	

Mitigation measure	Relevant impact; details of methods	Checklist √
	Mitigation measure 4.	
Manage concrete, cement, plastering, and painting activities to prevent pollution or contamination of surrounding environment.	See Section 7.5.3; Mitigation measure 5.	
All stockpiles of fine textured building materials and soils covered by a geotextile or plastic covering and bunded (e.g. with sandbags) when not in use.	See Section 7.5.3; Mitigation measure 6.	
Storage of all small items/building materials in containers or locked away in a designated area to prevent interference from animals.	See Section 7.5.3; Mitigation measure 7.	
All food waste disposed into designated bins and removed from site on a daily basis.	See Section 7.5.3; Mitigation measure 8.	
Construction only to take place during daylight hours to ensure adequate monitoring for fauna and to prevent the use of artificial lighting.	See Section 7.5.3; Mitigation measure 9.	
Before construction commences at the start of each day, ECO to do a walk-through of the demarcated footprint to check for (and remove if necessary) all animals with limited mobility. Contact the Fauna Specialist if necessary for assistance/guidance.	See Section 7.5.4; Mitigation measure 3a.	
If any fauna occur within the development footprint during construction, all activities must be halted, the incident reported to the	See Section 7.5.4;	

Mitigation measure	Relevant impact; details of methods	Checklist √
ECO and the animal(s) removed by ECO before construction can continue.	Mitigation measure 3b.	
Implement and enforce speed limits on all roads. Put up and maintain signs with speed limits and to warn drivers of wildlife at risk of becoming roadkill.	See Section 7.5.4; Mitigation measure 3c.	
Conclusion of construction phase:		
Site to cleared of all waste material, rubble, and debris associated with the construction phase at regular intervals during, and at the conclusion of the construction phase.	See Section 7.6; Mitigation measure 1.	
Revegetate bare soil areas with indigenous plants.	See Section 7.6; Mitigation measure 2.	
Check all drainage structures and remove blockages or pollutants.	See Section 7.6; Mitigation measure 3.	

APPENDIX 8: IMPACT ASSESSMENT METHODS

Criteria are ascribed for each predicted impact. These include the intensity (size or degree scale), which also includes the type of impact, being either a positive or negative impact; the duration (temporal scale); and the extent (spatial scale), as well as the probability (likelihood). The methodology is quantitative, whereby professional judgement is used to identify a rating for each criterion based on a seven-point scale (Table 12) and the significance is auto-generated using a spreadsheet through application of the calculations.

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

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

Consequence = type x (intensity + duration + extent)

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

Significance = consequence x probability

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

When assessing impacts, broader considerations are also considered. These include the level of confidence in the assessment rating; the reversibility of the impact; and the irreplaceability of the resource as set out in (Table 13, Table 14, and Table 15), respectively.

Table 12. Assessment criteria for the evaluation of impacts

Criteria	Numeric Rating	Category	Description
Duration	1	Immediate	Impact will self-remedy immediately
	2	Brief	Impact will not last longer than 1 year
	3	Short term	Impact will last between 1 and 5 years
	4	Medium term	Impact will last between 5 and 10 years
	5	Long term	Impact will last between 10 and 15 years
	6	On-going	Impact will last between 15 and 20 years

Criteria	Numeric Rating	Category	Description
	7	**Permanent**	Impact may be permanent, or in excess of 20 years
Extent	1	**Very limited**	Limited to specific isolated parts of the site
	2	**Limited**	Limited to the site and its immediate surroundings
	3	**Local**	Extending across the site and to nearby settlements
	4	**Municipal area**	Impacts felt at a municipal level
	5	**Regional**	Impacts felt at a regional level
	6	**National**	Impacts felt at a national level
	7	**International**	Impacts felt at an international level
Intensity	1	**Negligible**	Natural and/ or social functions and/ or processes are negligibly altered
	2	**Very low**	Natural and/ or social functions and/ or processes are slightly altered
	3	**Low**	Natural and/ or social functions and/ or processes are somewhat altered
	4	**Moderate**	Natural and/ or social functions and/ or processes are moderately altered
	5	**High**	Natural and/ or social functions and/ or processes are notably altered
	6	**Very high**	Natural and/ or social functions and/ or processes are majorly altered
	7	**Extremely high**	Natural and/ or social functions and/ or processes are severely altered
Probability	1	**Highly unlikely / None**	Expected never to happen
	2	**Rare / improbable**	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
	3	**Unlikely**	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
	4	**Probable**	Has occurred here or elsewhere and could therefore occur
	5	**Likely**	The impact may occur

Criteria	Numeric Rating	Category	Description
	6	**Almost certain / Highly probable**	It is most likely that the impact will occur
	7	**Certain / Definite**	There are sound scientific reasons to expect that the impact will definitely occur

Table 13. Definition of confidence ratings.

Category	Description
Low	Judgement is based on intuition
Medium	Determination is based on common sense and general knowledge
High	Substantive supportive data exists to verify the assessment

Table 14. Definition of reversibility ratings.

Category	Description
Low	The affected environment will not be able to recover from the impact - permanently modified
Medium	The affected environment will only recover from the impact with significant intervention
High	The affected environmental will be able to recover from the impact

Table 15. Definition of irreplaceability ratings.

Category	Description
Low	The resource is not damaged irreparably or is not scarce
Medium	The resource is damaged irreparably but is represented elsewhere

APPENDIX 9: LIST OF INDIGENOUS PLANT SPECIES OCCURRING ON SITE AND AVAILABLE AT LOCAL NURSARIES

Commercially available indigenous plant species that also occur on Portion 76/216 Uitzigt Farm. This list can be used as a guide for rehabilitation purposes, especially around the housing infrastructure on site. While this species list was compiled based on availability from one nursery (Kraaibosch Nursaries, George), these plants, in addition to any other indigenous species documented as naturally occurring on the property as per the Botanical Specialist Report (B. Fouche, Confluent Environmental), can be sourced from any local vendor for rehabilitation purposes. Particular focus should be given to the species also listed as "Fire-proof" since these can be planted to form a hedge around the buildings and aid in fire protection (Esler, Pierce and de Villiers 2014).

Plant species	Fire-proof?
Artemisia afra	
Athanasia dentata	
Dipogon lignosus	
Eriocephalus africanus	
Felicia echinata	
Grewia occidentalis	Yes
Halleria lucida	
Helichrysum cymosum	
Helichrysum teretifolium	
Linum africanum	
Metalasia muricata	
Morella cordifolia	
Phylica axillaris	
Polygala myrtifolia	
Searsia crenata	Yes
Selago corymbosa	
Selago villicaulis	