ANIMAL SPECIES SPECIALIST ASSESSMENT REPORT FOR THE PROPOSED RESIDENTIAL DEVELOPMENT ON THE REMAINDER OF ERF 2833, GREAT BRAK RIVER, MOSSEL BAY

Prepared by

Mr Willem Matthee

(Nelson Mandela University George Campus)

And

Prof. Jan A. Venter

(Nelson Mandela University George Campus)

Prepared for:

NewCare Innovations (Pty) Ltd

P.O. Box 4984

George East

Western Cape

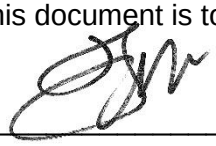
6539

14 February 2024

DECLARATION OF SPECIALIST INDEPENDENCE

We, Mr Willem Matthee and Prof. Jan A. Venter, hereby declare that:

- we are acting as independent specialists regarding this application;
- we do not have any interest, hidden or otherwise, in the outcome of this application, apart from financial compensation for the work done to survey the proposed development area and compile this report;
- surveying the site for this faunal compliance statement was done objectively, and that this report and the facts therein contained (regardless of its impact on the application approval process) will not be affected by any outside factors;
- we have the required expertise to perform surveys and produce compliance statements as it pertains to the faunal aspect of this proposed development
- we will comply with the relevant Acts, regulations and legislation;
- we have not, and will not, engage in conflicting interests while performing our duties for this activity, and have no influence over the decision-making authorities regarding their accepting or rejecting of this proposed development;
- we undertake to disclose to the applicant and competent authority all material and information within my possession that may influence the decision-making process regarding the proposed development;
- all particulars furnished by us in this form are true and correct, and that it is an offense to present a false declaration, and that such a false declaration is punishable in terms of Section 24F of the Act; and that
- this document is to be viewed as a whole, and not misquoted out of context.



Date: 14 February 2024

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DATE	REVISION	STATUS	PREPARED BY	CHECKED AND APPROVED BY
14 FEBRUARY 2024	0	Approved for submission	Willem Matthee	Prof. Jan A. Venter (SACNASP Registration Nr. 400111/14)
				

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1. INTRODUCTION

Cape EAPrac (Pty) Ltd was appointed to facilitate aspects regarding the environmental impacts of a proposed development on the Remainder of Erf 2833, Great Brak River, Mossel Bay (S34.054400º; E22.202961º). As per the "Protocols for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes (hereafter called "the Protocols"), as promulgated in Government Notice 320 (Government Gazette 43110, 20 March 2020), the Protocols must be adhered to for all new applications for Environmental Authorisation.

As per the Protocols, an animal species specialist report must:

a) identify the SCC which were found, observed or are likely to occur within the study area;
b) provide evidence (photographs or sound recordings) of each SCC found or observed within the study area;
c) identify the distribution, location, viability and provide a detailed description of the population size of the SCC identified within the study area;
d) identify the nature and extent of the potential impact of the development on the population of the SCC located within the study area;
e) determine the importance of the conservation of the population of the SCC identified within the study area, based on the information available in national and international databases;
f) determine the potential impact of the proposed development on the habitat of the SCC located within the study area;
g) include a literature review of the SCC population sizes, the conservation interventions, and any national or provincial management plans for the SCC. This should also indicate whether the development is compliant with the applicable species management plans;
h) identify dynamic ecological processes (e.g. fire in fire-prone ecosystems) occurring within the broader landscape that might be disrupted by the development and result in negative impacts on the identified SCC;
i) identify any potential impact of ecological connectivity in relation to the broader landscape, resulting in impacts on the identified SCC and its long-term viability;

j) determine buffer distances as per the Species Environmental Assessment Guidelines used for the population of each SCC;
k) discuss the presence (or likely occurrence) of additional SCC not identified by the screening tool, as well as undescribed species, or roosting and breeding and foraging areas used by migratory species (where these species show significant congregations) occurring in the vicinity; and
l) identify any alternative development footprints within the preferred site that would be of “low” or “medium” sensitivity as identified by the screening tool and verified through site sensitivity verification.
m) A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.

The Department of Forestry, Fisheries and the Environment (DFFE) screening tool (performed on 1 March 2023) identified the property as having a **High** sensitivity in terms of the animal species theme (Fig. 1). This is due to the potential occurrence of six species of conservation concern (SCC) at the study site (Table 3), or the development potentially impacting these six species. As a result, the development requires an animal species specialist assessment report, as per the Protocols. This specialist report will, based on the desktop assessment and site visits, identify the areas at the study area where SCC are most likely to occur, the potential impacts on the SCC, and mitigation measures to be included in the development to reduce the negative impacts and enhance potential positive impacts on the SCC.

The first site visit (performed on 26 March 2023) and associated site sensitivity verification report (SSVR) initially recorded the site as a site with medium sensitivity, but upgraded it to a high sensitivity, to align with the DFFE screening tool report. During the site visit for the SSVR, one Knysna warbler (*Bradypterus sylvaticus*) was heard in a neighbouring property, indicating the presence of that species in the area (albeit not in the study site during that visit). None of the other SCC were recorded during that site visit, though that site visit was not performed during the flight period of the two butterfly SCC (*Lepidochrysops littoralis* and *Aloeides thyra orientis*), and a second site visit was required. For this animal species specialist report, the second site visit was performed on 1 November 2023. During that site visit, an emphasis was placed on determining the presence of any SCC at the study site, determine population

sizes (if applicable), and determine the impacts of the proposed development on the SCC and other animal species at the study site and surrounding area, as prescribed by the Protocols.

This animal species specialist report is based on the data collected during the desktop study (using Cape Farm Mapper, Google Earth, iNaturalist, BGIS and GBIF) and site visit for the SSVR, as well as the data collected during the site visit of 1 November 2023.

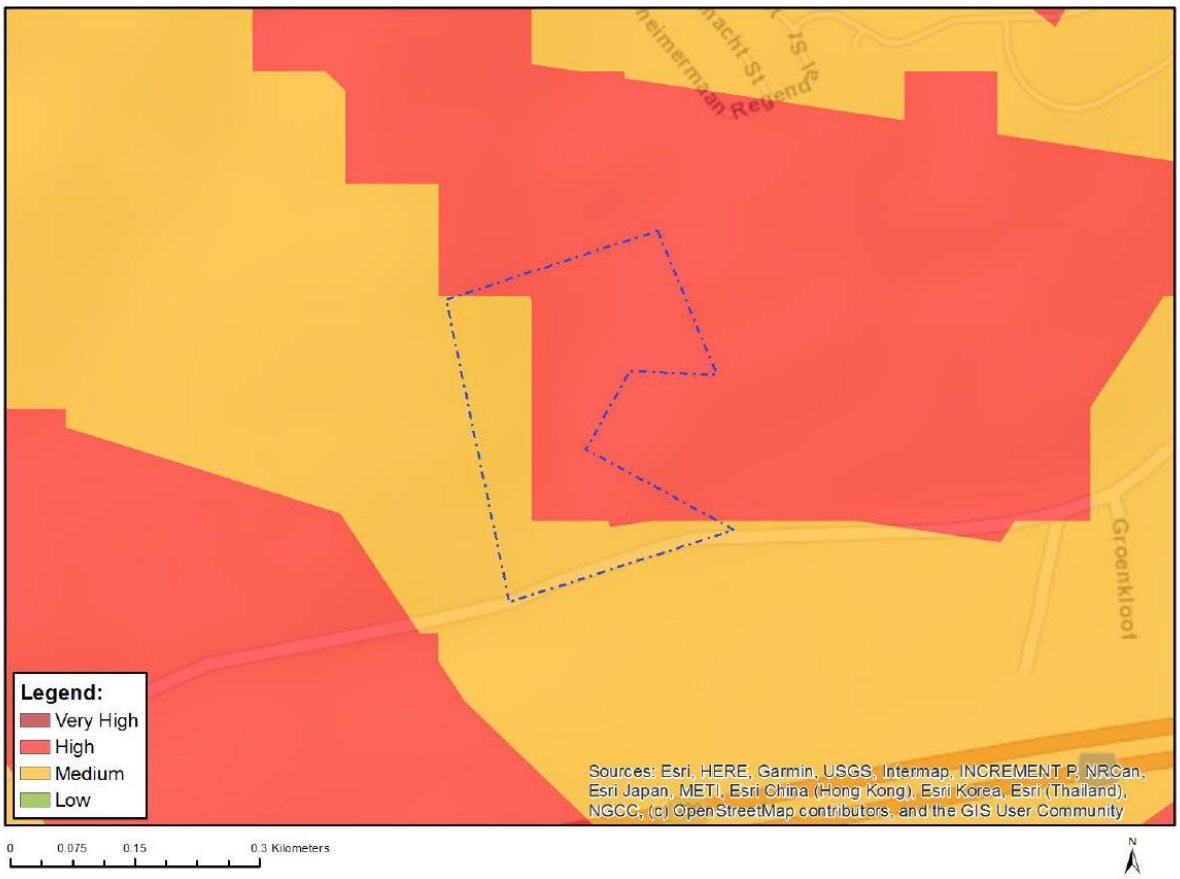

Fig. 1: The site sensitivity of the terrestrial animal species theme, as per the DFFE screening tool (performed 1 March 2023).

2. DETAILS OF THE SPECIALISTS

Both specialists that compiled this document have experience in faunal species identification, and the identification of suitable habitats for various species, from invertebrates to large mammalian species. Their details are in the table below.

Table 1. The details and experience of the specialists involved with this report.

Specialist and contact details	Qualifications	SACNASP Registration	Experience
Prof. Jan A Venter **Email:** JanVenter@mandela.ac.za **Mobile:** 0824161096	PhD(Biology) UKZN	400111/14	25 Years' experience in faunal ecology and conservation in both the government and tertiary education sector. Current position: Associate Professor in the Department of Conservation Management at Nelson Mandela University
Willem Matthee **Email:** WillemM@mandela.ac.za **Mobile:** 084 620 4246	M.Sc. (Nature Conservation) NMU	Not registered	Willem has three years' experience in surveying amphibian populations, and an additional five years of bird surveys. He has also been involved in animal diversity surveys on an on-off basis for the past four years. He has completed his MSc in Nature Conservation in 2014, and is in the process of completing his PhD in Nature Conservation. He currently lectures as a lecturer in Conservation Ecology at the Nelson Mandela University George Campus.

3. SITE DESCRIPTION

3.1. Location and vegetation

The site of the proposed development is the Remainder of Erf 2833, Great Brak River, Mossel Bay. The property has an estimated size of 60 270.5 m^2, and is located in Hartenbos Dune Thicket (previously classified as Groot Brak Dune Strandveld, which is classified as Endangered; Mucina & Rutherford, 2006). According to aerial imagery (from Google Earth - Appendix 1), clearing of vegetation (namely exotic *Acacia* trees) started between May 2021 and November 2021, with it continuing to the present (Appendix 1). The southern section of the study site is dominated by grasses (including exotic Kikuyu, *Cenchrus clandestinus*) and short shrubs, while the northern section is dominated by shrubs (including *Searsia glauca*, *Osteospermum moniliferum*, *Acokanthera oppositifolia*, *Grewia occidentalis* and *Gymnosporia buxifolia*). From the northeastern corner to the southwestern corner, a drainage line is present, which is dominated by thicket vegetation (indigenous and exotic vegetation, including *Acacia mearnsii*).

3.2. Development layout

The proposed development will be a residential development, with a large proportion of the study area remaining as green space, preferably of naturally-occurring vegetation.

Table 2: The size of each zonation category illustrated in the two SDPs (Figs 2 & 3).

		Non-mitigated alternative SDP		Preferred alternative SDP	
Zone colour	**Zonation**	**Area (ha)**	**% of total property**	**Area (ha)**	**% of total property**
	Single residential zone I	1.44	23.84	0.32	5.30
	General residential zone I	0.83	13.74	0.86	14.24
	Open space II	2.28	37.75	3.56	58.94
	Transport zone III (private road)	1.14	18.87	0.95	15.73
	Transport zone II (public road)	0.35	5.79	0.35	5.79
TOTAL		6.04	100	6.04	100

Fig. 2: The non-mitigated alternative SDP, with development focussed in three clusters, and the drainage line as a green space bisecting the development.

Fig. 3: The preferred alternative SDP, with infrastructure concentrated in two clusters, and the majority of the property as green space.

4. METHODOLOGY

4.1. Desktop Assessment

The desktop analysis consisted of Cape Farm Mapper to determine vegetation types at the study site, and the use of the Global Biodiversity Information Framework (GBIF) and iNaturalist for the confirmation of records of species of conservation concern (SCC) near the study area. References regarding the conservation statuses of SCC consisted of the IUCN Red List of Threatened Species, Taylor et al. (2015) for birds, Child et al. (2016) for mammals, and Mecenero et al. (2013) for butterflies.

Circus ranivorus occurs in areas where large freshwater ecosystems are present, and in the adjacent open grassland vegetation (Simmons, 2005). Although the Great

Brak River estuary system is relatively close (1.5 km from the site), the vegetation at the site is too dense to support this bird species, and it is unlikely that it will be impacted by this development.

Bradypterus sylvaticus prefers thickets of indigenous species, where a dense understorey is present, including in thickets of exotic bramble (*Rubus* sp.) and *Lantana camara* (Smith, 2005). They often occur watercourses, such as the one present at the site. Though there are no records on iNaturalist of this species in the area, I have observed them frequently in white milkwood (*Sideroxylon inerme*) thickets along the coast at Tergniet (approximately 1.5 km from the site), and there is therefore a high chance of it occurring at the site, if the vegetation along the seasonal stream at the site is suitable.

The chance of either (or both) butterfly species (***Lepidochrysops littoralis*** and ***Aloeides thyra orientis***) occurring at the site is dependent on the presence of larval host plants at the site. Though the larval food plant of *L. littoralis* (*Selago* spp.) occurs at the site, there is a very low chance of *L. littoralis* occurring at the site, as other parameters (limestone outcrops, or an abundance of proteoids) are not met, and there are no populations of this species nearby. *A. thyra orientis* is mostly known from the area around Knysna and Rheenendal, with an isolated record (August 2022) from the mountains north of Friemersheim (about 17km from the site). There is also an isolated population around Still Bay to the west (approximately 80 km from the study site). *L. littoralis* is known mostly from the Agulhas Plains to the west, with the closest observations (most recently from November 1989) being from the Robinson Pass (approximately 18 km from the site). For both these species, the likelihood of them occurring at the site is very unlikely.

Sensitive Species 8 (which cannot be disclosed) prefers dense indigenous forests and thickets, and usually move away from areas with high levels of disturbance (Venter et al., 2016). Though there is an isolated record of this species from the Great Brak River area (January 2019), this record is outside the normal distribution range of this species, and it was photographed in a patch of dense indigenous vegetation. If the vegetation at the site consisted only of indigenous tree species, there would have been a greater chance of this species occurring here. However, since the vegetation

at the study site has a high occurrence of exotic plants, there is a low chance of this species occurring at the site.

Aneuryphymus montanus is known from more rocky environments, usually in more arid environments with hard-leaved fynbos vegetation (Brown, 1960), with the closest observation being from the Swartberg Pass (1961). The habitat at the site is therefore probably not suitable, and the chance of it occurring here is very low.

Table 3: The six species of conservation concern (SCC) identified by the DFFE screening tool, and each species' conservation assessment, habitat requirements and likelihood of occurrence at the study site, based on the site sensitivity verification report, desktop assessment and the site visit on 1 November 2023.

Common name	**Threat Status**		**Habitat requirements**	**Likelihood of occurrence**
	International	**National**		
African marsh-harrier *Circus ranivorus*	Least Concern Decreasing	Endangered Decreasing (<2 500 adult individuals)	Estuaries and large wetlands with sufficient reedbeds for food and breeding	Very low There is no suitable habitat of sufficient size at the study site to support this species.
Knysna warbler *Bradypterus sylvaticus*	Vulnerable Decreasing	Vulnerable Decreasing (<2 500 adult individuals)	Forest edges, riparian thickets and coastal thickets where *Sideroxylon inerme* is present. Also utilises thickets dominated by lantana and bramble.	High The drainage line provides suitable habitat; one individual was heard calling during the site visit for the site sensitivity verification report.
Brenton copper *Aloeides thyra orientis*	Not assessed	Endangered Decreasing (Area of occupancy <10 km^2); no population estimate.	Knysna sand fynbos, likely in close association with *Lepisiota capensis* ants.	Very low This subspecies is known only from Brenton-on-Sea near Knysna, two populations near Still Bay, and one isolated record from Friemersheim.
Coastal blue butterfly *Lepidochrysops littoralis*	Endangered	Endangered Decreasing (Known from 10 locations between Bredasdorp and Mossel Bay; no population estimate).	Rocky limestone ridges or sand dunes in coastal fynbos.	Very low Not known from localities east of Mossel Bay; habitat likely not suitable, and not in a limestone-rich area.

Common name	Threat Status		Habitat requirements	Likelihood of occurrence
	International	National		
Sensitive Species 8 (which cannot be disclosed)	Least Concern	Vulnerable	Forests and dense woodlands, including coastal forests and thickets where sufficient canopy cover and a dense understorey is present.	Low The study area is surrounded by developments and alien invasive thickets, which is not preferred habitat. Very few records from the Southern Cape, with the exception of forests east of George.
		Declining (3 500 – 50 000 mature individuals estimated		
Yellow-winged agile grasshopper *Aneuryphymus montanus*	Vulnerable	Vulnerable	Dry, sclerophyllous fynbos in rocky foothills.	Very low Not known from the area, and no suitable habitat present at the study site.
		Likely declining No population estimates, and rarely collected.		

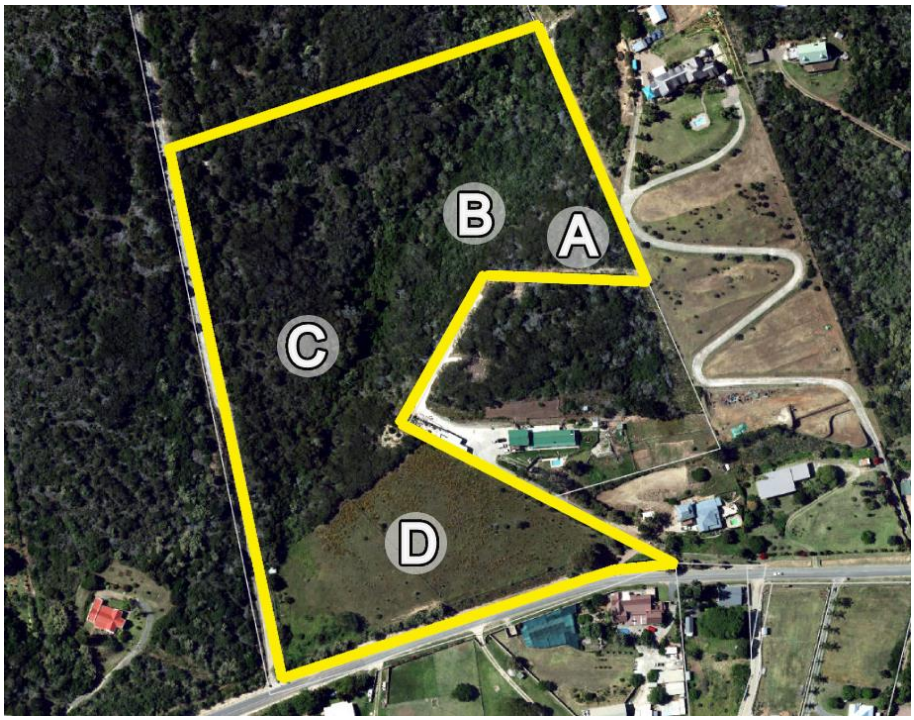

Fig. 4: The layout of the site, with main site characteristics labelled. Labels A-D correspond with labels given in Figures 5 and 5.

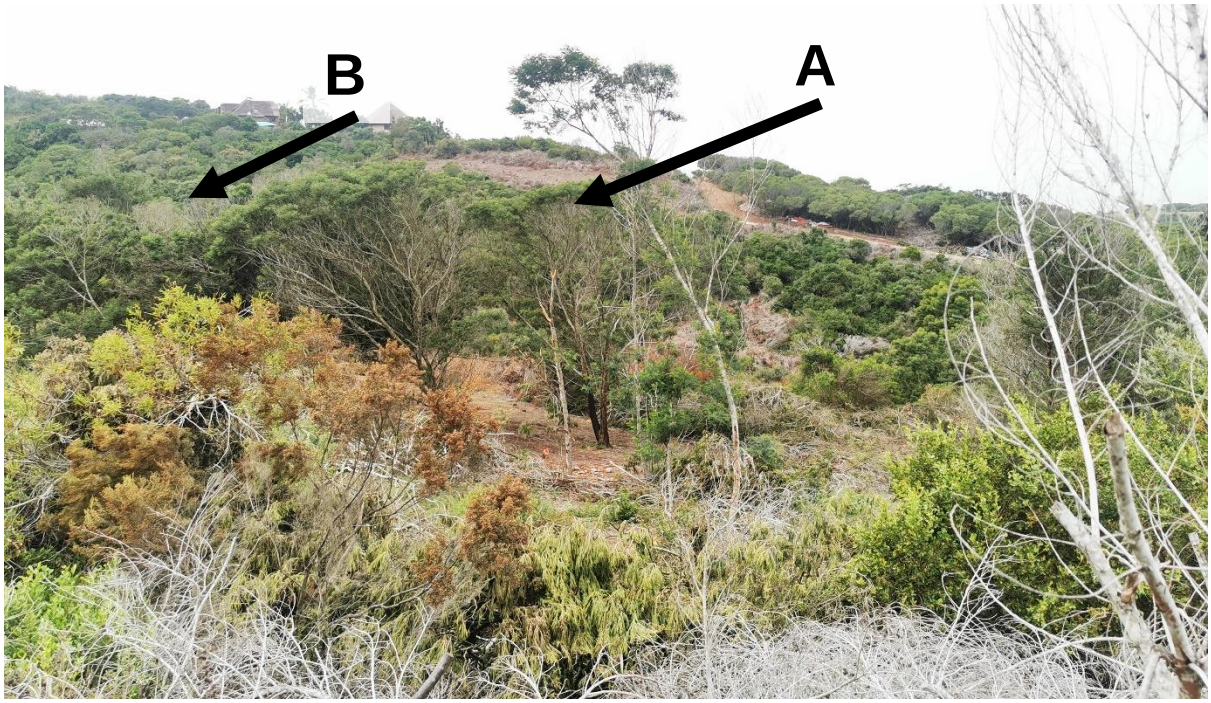

Fig. 5: Looking east from the western boundary of RE2833, an area dominated by *A. mearnsii* has been cleared. In the background, (A) the area cleared of *A. cyclops*, and (B) the seasonal stream vegetation are visible.

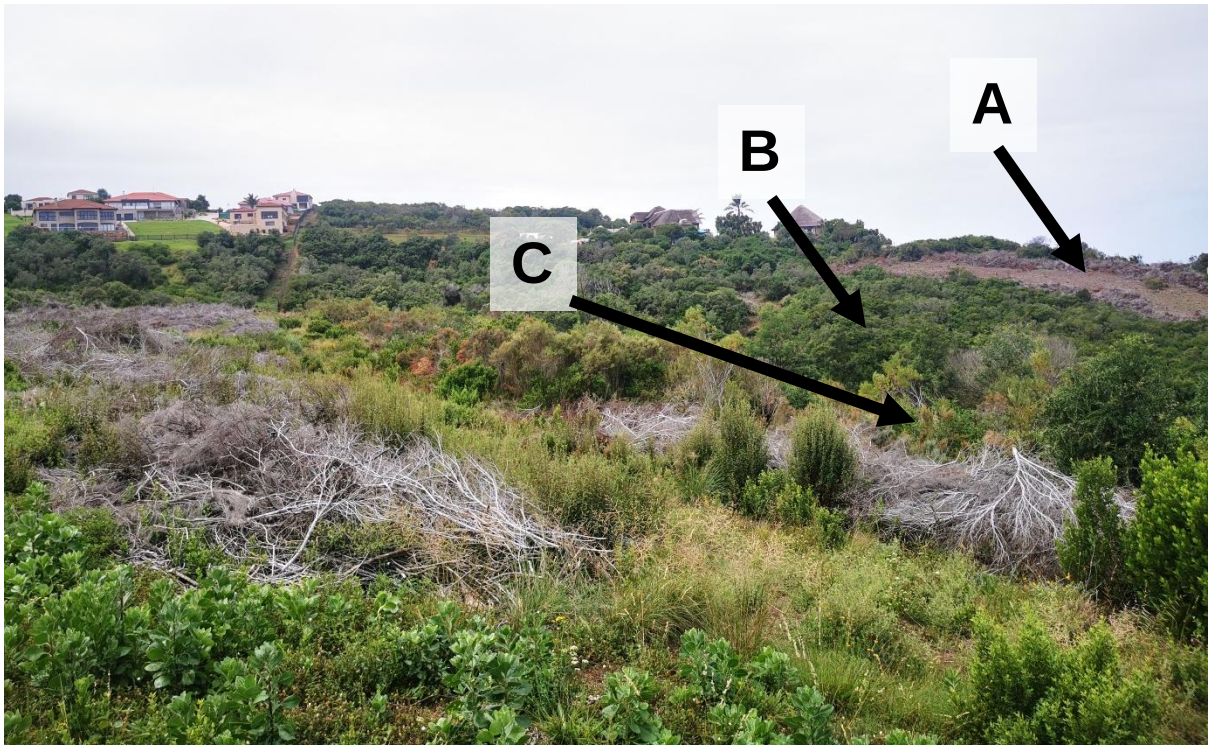

Fig. 6: Looking south onto RE2833, from the adjacent property, with (A) the cleared *A. cyclops*, (B) the seasonal stream vegetation, and (C) the mostly-indigenous shrubland and thicket labelled.

Fig. 7: The grass-dominated vegetation in the south of the property (labelled D in Fig. 4), with cleared *Acacia mearnsii* and *A. cyclops* in the foreground.

4.2. Site visits

4.2.1. Vegetation

The site visits, performed on 26 March 2023 and 1 November 2023, confirmed that the majority of the thickets at the site were dominated by exotic *Acacia* species, namely black wattle (*A. mearnsii*) and rooikrans (*A. cyclops*). The stream that is present at the site has some indigenous vegetation present, but also has a high density of exotic trees, especially towards the southwest of the site. Towards the south of the site, the vegetation is open, and dominated by grasses such as buffalo grass (*Stenotaphrum secundatum*) and kikuyu (*Cenchrus clandestinum*). A section of exotic black wattle trees along the western stretch of the property have been cleared between November 2022 and the first site visit (Fig. 5 & Fig. 7), while a section of rooikrans has also been cleared along the eastern section of the site during the same time period. Indigenous plant species recorded at the site consisted mainly of thicket species, such as cross-berry (*Grewia occidentalis*), false olive (*Buddleja saligna*), glossy currant (*Searsia lucida*), cat-thorn (*Scutia myrtina*), red currant (*Searsia chirindensis*) and common spike-thorn (*Gymnosporia buxifolia*). Smaller indigenous plant species recorded included Cape buckhorn (*Cynanchum africanum*), channelled heath (*Erica canaliculata*), and stiff bitterbush (*Selago corymbosa*). The occurrence of *Selago corymbosa* is of significance, as it is a potential larval host plant of the coastal blue butterfly, *L. littoralis* (Edge, 2021). The occurrence of this plant species could therefore indicate the potential presence of that butterfly at the site as well, but they were not recorded during the two site visits, and there are no records of this species from the area.

Exotic species (apart from the previously-mentioned *A. cyclops* and *A. mearnsii*) recorded at the site included bramble (*Rubus* sp.), Cape gooseberry (*Physalis peruviana*), black nightshade (*Solanum nigrum*), and lantana (*Lantana camara*). These species (apart from the two *Acacia* species) occur at relatively low densities at the site. There is also some Spanish reed (*Arundo donax*) present along the seasonal stream, towards the southwestern extent thereof.

An important characteristic of the property, is the presence of a seemingly seasonal stream that bisects the property. In the higher-lying section of this stream, vegetation is characterised by the presence of false olive (*Buddleja saligna*) and other indigenous thicket and forest species, but it is dominated by *Acacia mearnsii* in the lower-lying sections. This seasonal stream is likely an important ecological corridor, and would function more so if the exotic trees are removed, and locally indigenous vegetation allowed to establish.

4.2.2. Animal species surveys

During both site visits, an effort was made to cover the entire property. Site visits consisted of the surveyors walking on the property, with a focus on areas where (a) SCC are likely to occur; and (b) areas where development was most likely to occur according to the two SDPs (Figures 2 & 3). Records were based on visual observations (either seeing an animal clearly, or observing clearly-identifiable tracks or dung), or acoustic observations (where bird calls were identifiable). *B. sylvaticus* is an elusive species that is not easily observed unless it is calling, but responds well to call playbacks. For this species, we used call playbacks to attempt to elicit a response from any individuals in suitable habitat: these call playbacks consisted of playing a one-minute call of the species twice (15 minutes apart) in (or adjacent to) suitable habitats, and waiting for either acoustic or visual confirmation of this species' presence. Regardless of whether a response was received, we then proceeded to the next area with suitable habitat, and performed the call playback again. The route used to survey the property is recorded in Figure 8. Due to the difficult terrain of the dense thicket that bisects the property, the northeastern section of the property could not be traversed. However, the call playbacks of *B. sylvaticus* were used on the border of suitable habitat, and thickets were surveyed where possible (to determine the potential presence of Sensitive Species 8 at the study site).

During the site visits, all the animal species observed were recorded (Appendix 2), as well as important plant species observed on the property (especially those that may be important habitats or food sources for SCC, or form an important component of the vegetation present at the site).

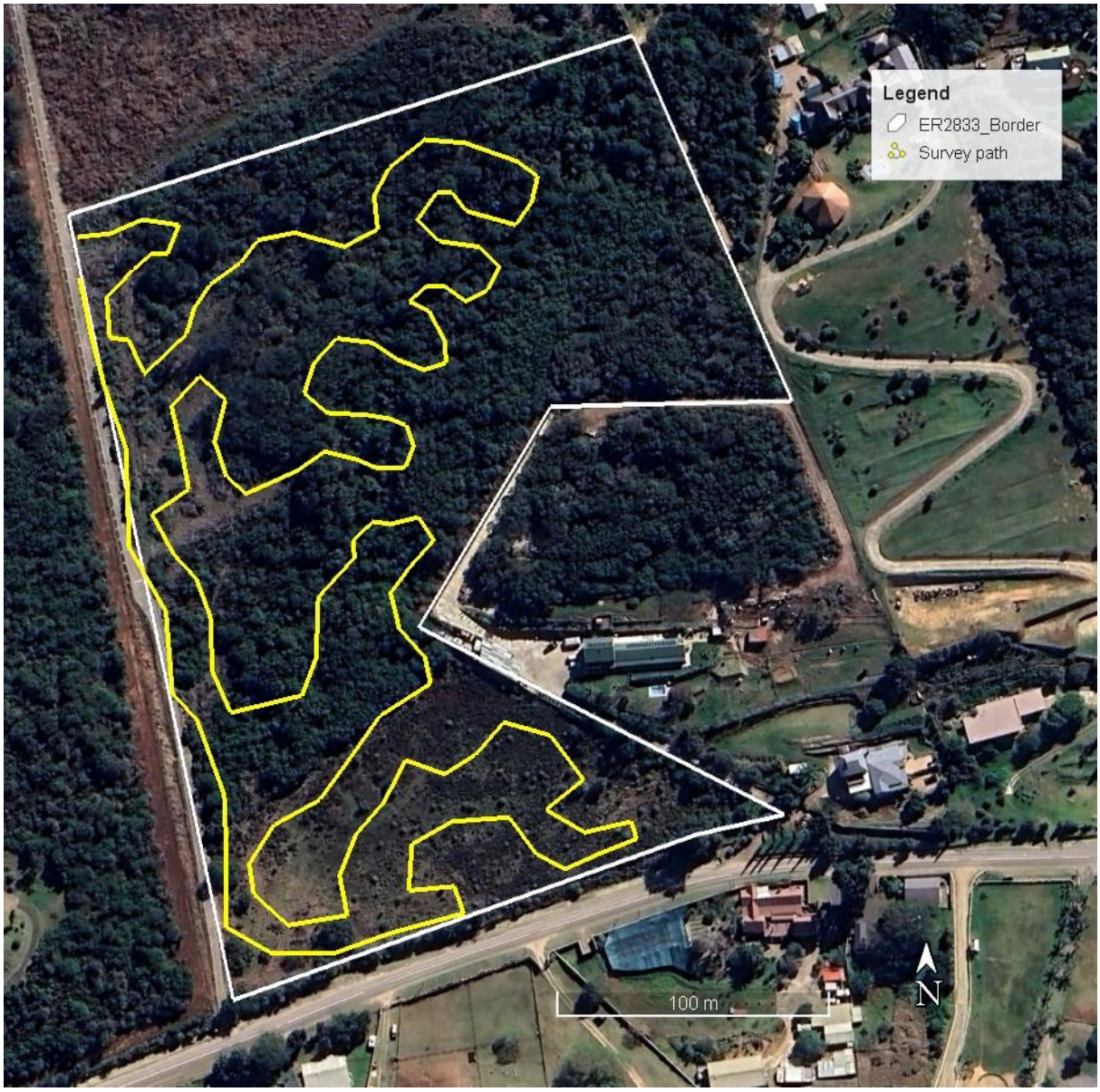

Fig. 8: The path followed during the site visit on 1 November 2023. During the site visit, the areas previously classified as low, medium and high sensitivity were surveyed.

5. FINDINGS AND EVIDENCE

5.1. Terrestrial animal species sensitivity

During the two site visits, no signs were found of *A. montanus*, Sensitive Species 8, *L. littoralis*, *A. thyra orientis*, or *C. ranivorus*. Additionally, the environment does not support the arid, mountainous scrubland required by *A. montanus*. No observations of the larval food plants of *A. thyra orientis* (Fabaceous plants in the *Aspalathus* Genus, and possibly *Indigofera erecta*) were made at the site during either of the two site visits, and it is unlikely that this species occurs at the study site. Though the presence of *Selago corymbosa* could indicate the presence of *L. littoralis* at the site, this butterfly species prefers limestone-rich outcrops (Edge, 2021), which is not present at the site, and their undetected presence is very unlikely. The seasonal stream that bisects the property could host Sensitive Species 8, though it is unlikely, due to the high rates of invasion by *A. cyclops* and *A. mearnsii* along the stream and surrounding vegetation, and the level of disturbance associated with the neighbouring properties. It is also highly unlikely that *C. ranivorus* would utilise this site, as (with the exception of the grassy habitat to the south of the site) the vegetation is too dense and tall to be suitable habitat for that species. Additionally, the grassy section of the property is too small (and too far from the nearest large wetland or estuary) for it to be suitable *C. ranivorus* habitat.

During the first site visit (on 26 March 2023), a Knysna warbler, ***Bradypterus sylvaticus*** was heard calling on an adjacent property, and it is very likely that this species moves through the vegetation along the seasonal stream and makes use of the surrounding thickets. Due to the potential habitat suitability of the seasonal stream, and the apparent presence of this species in the area, there is a high chance that it occurs at the site, and will be impacted by the development. However, no observations (visual or acoustic) were made of this species during the site visit of 1 November 2023. It is therefore possible that the drainage line acts as a corridor for this species, but was not utilised for breeding during the time of the second site visit. Due to the short nature of the call that was given during the March 2023 site visit, and the absence of the species from the area during the November 2023 visit, no recording of the sound could be made to post to iNaturalist, nor could a photograph be taken, due to the secretive nature of this species. Due to habitat suitability, however, it is assumed that this

species frequents the thicket vegetation along the drainage line, and could occur in groups of up to ten individuals (based on personal observations in areas of similar size and vegetation structure at Still Bay, Western Cape).

A total of 43 animal species were recorded during the site visits (Appendix 2), with 18 species recorded during the March 2023 site visit, and 30 species recorded during the November 2023 site visit. Apart from the *B. sylvaticus* heard during the March 2023 site visit, none of the species recorded were of conservation concern, and the majority were generalist species that are common in the area.

5.2. Development impacts on SCC

The development will have different impacts on the SCC occurring (or possibly occurring) at the study site during the initial construction phase and the subsequent operational phase. The likely impacts on each of the SCC are discussed for the construction and operational phases separately, and summarised in a table for each SCC. In the discussion, and the summary tables, the “non-mitigated alternative” refers to the SDP without consideration for sensitive areas (Fig. 2), the “preferred alternative” refers to the SDP that incorporates the recommendations and sensitivity scores of the site sensitivity verification reports (Fig. 3), and “no go” refers to no development or interaction (including the exclusion of fire, and no further removal of exotic plants from the property).

5.2.1. Impacts during the construction phase

During the initial construction phase, the main impacts on animal species will consist of **removal of vegetation** within the development footprint, and **noise disturbance** in the general area (including the areas that will not be developed, such as the thicket vegetation).

a) African Marsh-harrier, *Circus ranivorus*

Circus ranivorus is highly unlikely to be affected by this development, due to the absence of suitable habitat for it to occur at the study area. It is also highly unlikely that it would use the study area as a corridor or feeding site, due to the lack of standing water and reedbeds of sufficient size to support this species. For all three options (non-

mitigated alternative, preferred alternative, and no-go), the this development will not affect the species.

b) Knysna Warbler, *Bradypterus sylvaticus*

Bradypterus sylvaticus will potentially be affected more significantly by the development. With a high likelihood of this species occurring in the riparian thicket vegetation on the property, significant disturbances in or near this habitat may influence this species. The most likely impacts consist of the removal of thicket vegetation utilised by *B. sylvaticus*, and the noise associated with construction affecting breeding of this species. This species has highly seasonal breeding, with nesting, incubation and fledging occurring between September and November (Smith, 2005). During the breeding period, both males and females are resident in the nesting territory; during the remainder of the year, females may move to other areas, while males largely remain behind. Construction is likely to have the most significant impact on this species during the breeding season (September-November). This species requires a dense understorey in thicket vegetation, a habitat that is reduced under the dense canopy of monospecific exotic tree stands (particularly *A. cyclops* and *A. mearnsii*). It is therefore important that these exotic trees be removed, and the recovery of the thicket vegetation promoted. As some construction is to take place next to some of the indigenous thicket vegetation, it is important that proper hoarding is utilised, to prevent the spillage of building material into the vegetation or construction workers going into the thicket during the construction phase. Limiting construction to periods outside the breeding season and removing the exotic trees within the thickets (without removing indigenous thicket vegetation) are mitigation measures recommended to reduce the impacts on this species during the construction phase.

Table 4: The likely impacts on *B. sylvaticus* during the construction phase of the development, for the three alternatives.

	Non-mitigated Alternative	**Preferred Alternative**	**No Go Option**
Nature of impact	Loss of a section of habitat, particularly along the thicket edge in the northeastern section of the property. Noise disturbance, potentially disturbing breeding attempts.	Negligible habitat loss. Disturbance of breeding attempts, if construction performed during breeding season.	None, apart from potential habitat loss if the alien invasive plants (AIPs) increase in abundance.
Extent and duration of impact	Largely confined to the study area; if too much thicket vegetation is removed, it would hamper the mobility of the species in the surrounding landscape. Likely short-term (0-5 years) impacts, but long-term (6-15 years) if repeated disturbances occur, or there is large-scale habitat loss.	If construction occurs during each breeding season, it could impact the persistence of this species in the surrounding area. Likely short-term (0-5 years) impacts, but long-term (6-15 years) if repeated disturbances during the breeding season occurs.	If the thicket vegetation gets replaced by AIPs completely, it would have a permanent impact on the species, resulting in their disappearance from the study area.
Consequences of impact or risk	High, destructive impact; If habitat loss occurred alongside noise disturbance during the breeding season, it would likely result in the species moving away from the area, and possibly not returning in following years.	Medium, destructive impact; Repeated disturbance during the breeding season may result in the species abandoning the study area.	High, destructive impact; Likely extinction of the species at the study area due to habitat transformation (AIP invasion).

	Non-mitigated Alternative	**Preferred Alternative**	**No Go Option**
Probability of occurrence	Highly probable; Due to the combination of habitat loss and noise disturbance, this species would very likely abandon the site for a number of years.	Probable; If noise disturbance occurs repeatedly during the breeding season, the disturbance is highly likely to impact this species. If the impacts are mitigated, there is a low likelihood that this species will be impacted severely.	Probable; It is difficult to quantify the likely impacts on this species if AIPs increase in abundance, as the exotic vegetation decreases feeding and breeding habitat, but could still act as a corridor for dispersal.
Degree to which the impact may cause irreplaceable loss of resources	If unmitigated, this could result in the local disappearance of the species from the study area, and likely hamper movement of the species across the landscape.	With mitigation measures, the impacts are less severe, and with correct application of the mitigation measures, the long-term impacts would be negligible.	If invasion by AIPs increase to the extent that indigenous thicket vegetation is replaced by AIPs, the loss of habitat and feeding resources would be difficult and expensive to reverse.
Degree to which the impact can be reversed	Habitat loss would be near impossible to replace/reverse. If the preferred habitat is still present, a period of construction exclusion during the breeding season could reverse the species' disappearance from the study area.	With negligible habitat loss, and mitigating the negative impacts by limiting construction to periods outside the breeding season, the impacts can be reversed easily.	Difficult to reverse if the area has a very high density of AIPs and the habitat is no longer suitable for the species.
Indirect impacts	None	None	None
Cumulative impact prior to mitigation	High (-)	Medium (-)	Medium to High (-)
Significance rating of impact prior to mitigation	High (-)	Medium (-)	Medium to High (-)

	Non-mitigated Alternative	Preferred Alternative	No Go Option
Can these impacts be mitigated?	No	Yes	Not in this scenario
Proposed mitigation	No construction during the breeding season of this species (end-August until early-December); No removal of indigenous thicket vegetation; Removal of AIPs, particularly in the thicket vegetation		
Degree of confidence	High	High	Medium (uncertain about how significant the impact of AIPs will be on this SCC)
Significance of impacts on the development	High (No development in or adjacent to the thicket vegetation; no construction during the breeding season of this SCC)		

c) Eastern Red Copper, *Aloeides thyra orientis*, and Coastal Blue, *Lepidochrysops littoralis*

Aloeides thyra orientis has a very low likelihood of occurrence, with no specimens recorded from the area before, and an absence of the larval host plants at the study site. However, it is possible that there are larval host plants present on the property, and a very low (but still possible) likelihood that there were unobserved specimens of this species at the study site. The most significant potential impact of the construction phase on this butterfly species, is the removal of vegetation, resulting in a loss of food for the adults, and a loss of larval host plants for reproduction. This can be mitigated by not clearing short, indigenous vegetation beyond those areas that are necessary to clear, allowing this species (if present) to persist in refugia (safe areas with suitable habitat) during construction. The re-establishment of natural fynbos vegetation in the northeastern corner (where *A. cyclops* had been removed) could aid the survival of this (and other) butterfly species, particularly since it is not to be developed under the Preferred Alternative SDP (as opposed to the Non-mitigated Alternative SDP, where it was earmarked for development).

Lepidochrysops littoralis was not recorded during the site visits, and is not known from the area around the study site. The closest, most recent record of this species, is from the Robinson Pass (approximately 16 km north of the study site), where a specimen was collected in November 1989). This species has been recorded from rocky outcrops in coastal sandy fynbos, but no rocky outcrop is present at the site. The larval food plant of this species is suspected to be *Selago* spp. (Edge, 2005), of which *Selago corymbosa* was recorded at the study site. It is therefore possible that this species does occur at the study site, though there is a very low likelihood thereof (due to the lack of specimens from the area, and the lack of rocky outcrops at the study site). If this species is present at the site, the same impacts and mitigations as for *A. thyra orientis* are relevant here: habitat destruction would be the main impact, and establishment of natural fynbos vegetation (particularly in the northeastern section where *A. cyclops* has been removed) would be the best mitigation measure that can be implemented.

Table 5: The likely impacts on *A. thyra orientis* and *L. littoralis* during the construction phase of the development, for the three alternatives.

	Non-mitigated Alternative	**Preferred Alternative**	**No Go Option**
Nature of impact	Loss of a section of habitat, particularly in sections where there are potential larval host plants present.	Loss of a section of habitat, particularly in sections where there are potential larval host plants present.	None, apart from potential habitat loss if the alien invasive plants (AIPs, mainly the exotic kikuyu grass, *Cenchrus clandestinum*) increase in abundance.
Extent and duration of impact	Largely confined to the study area; if too much fynbos vegetation is removed, it would hamper the ability of the vegetation to sustain the larvae and adults of these species, and the mobility of these species in the surrounding landscape. Likely long-term (6-15 years) impacts, considering the amount of vegetation removed for the development.	Largely confined to the study area; if too much fynbos vegetation is removed, it would hamper the ability of the vegetation to sustain the larvae and adults of these species, and the mobility of these species in the surrounding landscape. Likely long-term (6-15 years) impacts, considering the amount of vegetation removed for the development.	If left unchecked AIPs (*Acacia* spp., and kikuyu grass) would likely alter the habitat to the extent that it could not support these species at all if they do occur in the area. Likely long-term (6-15 years) impacts, especially if there is a high amount of habitat transformation due to AIPs.

	Non-mitigated Alternative	**Preferred Alternative**	**No Go Option**
Consequences of impact or risk	High, destructive impact; Without suitable habitat, these butterflies are highly unlikely to occur at the site (if they are present but undetected).	Medium, destructive impact; Habitat transformation and habitat destruction will impact these species (if they are present but undetected). However, with some areas remaining as green space, there are still remnants of suitable habitat present.	Medium, destructive impact; Impacts are likely less severe than for *B. sylvaticus*, but if the existing vegetation with suitable larval food is replaced by stands of AIPs, there would be no suitable habitats left for these species.
Probability of occurrence	Highly probable; Due to habitat loss, these species would very likely abandon the site for a number of years.	Probable; If, as per this SDP, there is ample green space present on the property, with suitable habitat, the likelihood of these impacts occurring is less than without mitigation.	Probable; It is difficult to quantify the likely impacts on these species if AIPs increase in abundance, as the exotic vegetation decreases feeding and breeding habitat, but the extent to which these species will be affected (if they are present) is difficult to quantify.
Degree to which the impact may cause irreplaceable loss of resources	If unmitigated, this could result in the local disappearance of these (and other butterfly) species from the study area, if they are present.	With mitigation measures, the impacts are less severe, and with correct application of the mitigation measures, the long-term impacts would be negligible.	If invasion by AIPs increase to the extent that indigenous fynbos vegetation is replaced by AIPs, the loss of habitat and feeding resources would be difficult and expensive to replace.

	Non-mitigated Alternative	Preferred Alternative	No Go Option
Degree to which the impact can be reversed	Habitat loss would be near impossible to replace/reverse. If the preferred habitat is still present post-development, the maintenance of the fynbos vegetation for these (and other) butterfly species could reverse the impacts of the development.	With reduced habitat loss, and mitigating the negative impacts by limiting construction to demarcated areas (and keeping some fynbos vegetation intact), the impacts can be reversed moderately easily.	Difficult to reverse if the area has a very high density of AIPs and the habitat is no longer suitable for these species.
Indirect impacts	None	None	None
Cumulative impact prior to mitigation	High (-)	Medium (-)	Medium to High (-)
Significance rating of impact prior to mitigation	High (-)	Medium (-)	Medium to High (-)
Can these impacts be mitigated?	No	Yes	Not in this scenario
Proposed mitigation	Conservation of some intact fynbos vegetation with larval food plants.		
Degree of confidence	Medium (not certain whether these species are absent from the site or simply unrecorded during the site visits)	Medium (not certain whether these species are absent from the site or simply unrecorded during the site visits)	Medium (not certain whether these species are absent from the site or simply unrecorded during the site visits)
Significance of impacts on the development	High (Some fynbos vegetation should be left as part of the green belt)		

d) Sensitive Species 8

Sensitive Species 8 (which cannot be disclosed), was not recorded at the study site during the two surveys. This species frequents thickets and forested areas, but there are very few records of the species west of George, Western Cape. Due to the proximity of this development to already-existing infrastructure, there is a low to medium likelihood of this species occurring at the study area.

The riparian thicket bisecting the property is, however, very dense, and it is possible that this species inhabits this thicket. Anecdotal records indicate that this species likely occurred all along the coast in the area forty years ago, but urban expansion in the area may have resulted in their population decline (or possible regional extinction). If they are in the area, the main impacts during the construction phase will be noise disturbance, a loss of habitat (if the indigenous thicket is not preserved), potential snaring by workers, and reduced mobility. These animals are non-seasonal breeders, and there is no set time to limit construction to in order to mitigate these impacts. In terms of habitat loss, this impact will be minimal, as long as the thicket remains intact.

A reduction in mobility may be a more serious threat, as the property is likely to be surrounded by a fence that does not allow for terrestrial animal movement. It is suggested that the presence or absence of this species is determined through the use of camera traps or track monitoring post-development (see the impacts during the operational phase section), and management interventions be implemented if they are present. Additionally, small funnel-like structures or gaps can be placed in the fenceline, to facilitate the movement of these and other small to medium-sized animals. These funnels can be small enough to prevent human trespassers from gaining access to the property, while still allowing smaller animal species such as Sensitive Species 8, caracal, genets, and mongooses to move past the fenceline. It is recommended that these gaps are 20 cm wide, and 30 cm in height, and should be placed (a) adjacent to the stream habitat, and (b) in areas where these animals can easily be cornered. Care must be taken not to place them along the main road to the south of the property (to avoid collisions with passing cars). Camera traps can also be set up at these funnels, to monitor the use thereof by local wildlife. It is recommended that these funnels are monitored (with camera traps, or by the environmental control officer investigating each funnel for signs of Sensitive Species 8 and other wildlife

using the funnels) during construction, and again 6 months after construction, to monitor whether a change in animal species moving through the fence is observed.

Lastly, there is a chance that snares are set by workers during the construction phase. Constant monitoring by the environmental site officer will be important to prevent this from happening. The setting of snares will not only affect this species, but would also impact some of the other animal species present in the area (e.g. Cape Grysbok, Bushbuck, Caracal, and Porcupine). It is therefore important that it is specified in the environmental management plan that it is the environmental site officer's responsibility to prevent the setting of snares during any construction on the property.

Table 6: The likely impacts on Sensitive Species 8 during the construction phase of the development, for the three alternatives.

	Non-mitigated Alternative	**Preferred Alternative**	**No Go Option**
Nature of impact	Loss of a section of habitat, particularly the dense thicket vegetation. Also, noise disturbance during construction. Reduction in mobility associated with fencing of the property. Snaring by workers on-site.	Little loss of thicket habitat, but noise disturbance during construction still a potential disturbance. Reduction in mobility associated with fencing of the property. Snaring by workers on-site.	None, apart from potential habitat loss if the alien invasive plants (AIPs, mainly the exotic *A. cyclops* and *A. mearnsii*) increase in abundance.
Extent and duration of impact	Largely confined to the study area; if too much thicket vegetation is removed, it would hamper the ability of the vegetation to sustain this species, and the mobility of this species in the surrounding landscape. Likely long-term (6-15 years) impacts, considering the amount of vegetation removed for the development. Snaring by workers will only be a potential issue during the construction phase itself.	Largely confined to the study area; there is little reduction in suitable habitat, but the mobility of this species in the surrounding landscape may still be reduced. Likely long-term (6-15 years) impacts, considering the degree to which mobility is hampered. Snaring by workers will only be a potential issue during the construction phase.	If left unchecked AIPs (*Acacia* spp.) would likely alter the habitat to the extent that it could not support these species in terms of food, if they do occur in the area. Likely long-term (6-15 years) impacts, especially if there is a high amount of habitat transformation due to AIPs.

	Non-mitigated Alternative	**Preferred Alternative**	**No Go Option**
Consequences of impact or risk	High, destructive impact; The noise disturbance of construction is likely to result in individuals of this species moving away. This, along with a reduction in suitable habitat (thicket), along with a reduction of mobility associated with fencing of the property is likely to lead to a reduction in the survivability of this species at the site, if they occur there but are undetected).	Medium, destructive impact; The noise disturbance of construction is likely to result in individuals of this species moving away. This, along with a reduction of mobility associated with fencing of the property is likely to lead to a reduction in the survivability of this species at the site, if they occur there but are undetected.	Medium, destructive impact; Impacts are likely less severe than for *B. sylvaticus*, but if the existing thicket vegetation is replaced by stands of AIPs, there would be no suitable habitats left on the property for this species.
Probability of occurrence	Probable; Due to habitat loss and noise disturbance, this species would possibly abandon the site for a number of years.	Probable; If, as per this SDP, there is ample green space present on the property, with suitable habitat, the likelihood of these impacts occurring is less than without mitigation.	Probable; It is difficult to quantify the likely impacts on this species if AIPs increase in abundance, as the exotic vegetation decreases feeding and breeding habitat.

	Non-mitigated Alternative	Preferred Alternative	No Go Option
Degree to which the impact may cause irreplaceable loss of resources	If unmitigated, this could result in the eventual local disappearance of this species from the study area, if it is present. Catching of animals with snares could result in the removal of this species from the area, as they have large territories, and there would be a maximum of two or three present in the immediate area.	With mitigation measures, the impacts are less severe, and with correct application of the mitigation measures, the long-term impacts would be negligible. Catching of animals with snares could result in the removal of this species from the area, as they have large territories, and there would be a maximum of two or three present in the immediate area.	If invasion by AIPs increase to the extent that indigenous thicket vegetation is replaced by AIPs, the loss of habitat and feeding resources would be difficult and expensive to replace.
Degree to which the impact can be reversed	Habitat loss would be near impossible to replace/reverse. If the preferred habitat is still present post-development, the maintenance of the thicket vegetation (in terms of AIP clearing) for this species could reverse the impacts of the development. Reversal of snaring would be difficult to achieve, as it would require re-introduction of new individuals.	With negligible habitat loss, and mitigating the negative impacts by limiting construction to demarcated areas, the impacts can be reversed moderately easily. Reversal of snaring would be difficult to achieve, as it would require re-introduction of new individuals.	Difficult to reverse if the area has a very high density of AIPs and the habitat is no longer suitable for this species.
Indirect impacts	None	None	None

	Non-mitigated Alternative	Preferred Alternative	No Go Option
Cumulative impact prior to mitigation	High (-)	Medium (-)	Medium to High (-)
Significance rating of impact prior to mitigation	High (-)	Medium (-)	Medium to High (-)
Can these impacts be mitigated?	No	Yes	Not in this scenario
Proposed mitigation	Conservation and management (e.g. removal of AIPs) of thicket vegetation. Using a fence that allows this species to move through, while still excluding human trespassers. No unsupervised workers on the property, and ensuring that no animals are captured on the property (close supervision).		
Degree of confidence	Medium (not certain whether this species is absent from the site or simply unrecorded during the site visits)	Medium (not certain whether this species is absent from the site or simply unrecorded during the site visits)	Medium (not certain whether this species is absent from the site or simply unrecorded during the site visits)
Significance of impacts on the development	High (Indigenous thicket vegetation should be left undisturbed apart from AIP removal, and the fence around the property should allow this species to move through the area)		

e) Yellow-winged Agile Grasshopper, *Aneuryphymus montanus*

Aneuryphymus montanus was not recorded at the site during the site visits, nor is it likely to occur at the study area, due to an absence of the preferred habitat (arid, sclerophyllous fynbos) and preferred substrate (rocky areas within the preferred habitat). The closest records of this species are from the Swartberg and Langkloof, which are both dominated by arid, sclerophyllous fynbos on rocky substrates. Due to the highly unlikely nature of this species' occurrence at the site, the development is highly unlikely to have an influence on the continued survival of this species

Based on the above descriptions and tables, the main impacts on the SCC occurring at the study site (*B. sylvaticus*) and possibly occurring at the site (*A. thyra orientis, L. littoralis* and Sensitive Species 8) during construction consist of noise disturbance, reduction in available habitat, and reduction in mobility (for Sensitive Species 8). These impacts are more severe for the SDP without mitigation, while the SDP with mitigation has development confined to areas outside the thicket vegetation (reducing the potential impacts on *B. sylvaticus* and Sensitive Species 8), and with sufficient green space on the property to promote the persistence of indigenous species occurring on the property. The no-go alternative (consisting of no development or intervention) is likely to result in an increase in AIPs on the property, which will likely impact the SCC (and other indigenous species on the property) negatively. The main mitigation measures that can be implemented consist of limiting construction to periods outside the breeding season of *B. sylvaticus*, using a fence that promotes the movement of Sensitive Species 8 between this and adjacent property, and establishing areas where indigenous fynbos vegetation (with the larval plant species of the two butterfly species are present), and maintaining these areas correctly.

5.2.2. Impacts during the operational phase

During the operational phase, impacts on animal species could include increased predation of *B. sylvaticus* by pets (particularly cats), invasion by garden ornamental plants, disturbance in sensitive areas, reduced movement of species such as Sensitive Species 8, and re-invasion of exotic *Acacia* species post-clearing.

a) African Marsh-harrier, *Circus ranivorus*

Circus ranivorus is unlikely to be impacted by this development in the operational phase, due to the lack of suitable habitat for this species to occur at the study area, and the very low likelihood that it occurs at the site. Since this species is also highly unlikely to use this property as a corridor between areas with suitable habitat, this development will not impact the continued survival of this species.

b) Knysna Warbler, *Bradypterus sylvaticus*

Bradypterus sylvaticus is more likely to be impacted by the operational phase of this development. The main impacts are increased predation by cats (feral and domestic), disturbance during the breeding season, and a change in habitat (particularly if exotic plants such as the *Acacia* species re-establish post-clearing. Leaving the study area undisturbed (the no-go alternative) would likely result in an increased canopy density, dominated by exotic *Acacia* species, leading to a decrease in the undergrowth and a subsequent decrease in this species within the thicket vegetation. Predation by feral and domestic cats could be a more serious threat to the persistence of this species, particularly during the breeding period, when vulnerable chicks and fledglings are present. Visser and Hockey (2002) recorded a mortality rate of 83.3 per cent of eggs and chicks up to fledging, likely due to nocturnal predators (such as rodents and cats). Cats have also been proven to be highly destructive in areas around habitation, and have been estimated as the most significant anthropogenic cause of mortality in North American birds and mammals (Loss et al., 2013). Mitigation measures that can be implemented are:

(a) the removal (during the construction phase outside the breeding season) and continued control (during the operational phase, but outside the breeding season) of exotic trees such as *Acacia cyclops* and *A. mearnsii*;

(b) preventing unnecessary disturbance (such as clearing) of indigenous thicket vegetation; and

(c) prohibiting the presence of domestic cats on the property; or

(d) requiring that all pets (cats and dogs, particularly) are housebound (i.e., no free-roaming cats and dogs on the property), to reduce the predation risk to adults or their chicks.

Table 7: The likely impacts on *B. sylvaticus* during the operational phase of the development, for the three alternatives.

	Non-mitigated Alternative	**Preferred Alternative**	**No Go Option**
Nature of impact	Noise disturbance from houses directly adjacent to the thicket vegetation. Predation by cats, particularly during the breeding season.	Negligible habitat loss. Predation by cats, particularly during the breeding season.	None, apart from potential habitat loss if the alien invasive plants (AIPs) increase in abundance.
Extent and duration of impact	Likely short-term (0-5 years) impacts, but long-term (6-15 years) if there is a high mortality of chicks, fledglings and adults caused by domestic cats, or if disturbances from residences result in these birds leaving the area.	Likely short-term (0-5 years) impacts, but long-term (6-15 years) if there is a high mortality of chicks, fledglings and adults caused by domestic cats, or if disturbances from residences result in these birds leaving the area.	If the thicket vegetation gets replaced by AIPs completely, it would have a permanent impact on the species, resulting in their disappearance from the study area.
Consequences of impact or risk	High, destructive impact; If excessive noise disturbance occurs in residences adjacent to thicket vegetation during the breeding season, it would likely result in the species moving away from the area, and possibly not returning in following years. Reduced breeding success and increased predation by domestic cats (especially from residences adjacent to the thicket) could result in the local extinction of the species.	High, destructive impact; Lower likelihood of noise disturbances affecting this species, as there are no residences adjacent to the thicket vegetation. Reduced breeding success and increased predation by domestic cats could result in the local extinction of the species.	High, destructive impact; Likely extinction of the species at the study area due to habitat transformation (AIP invasion).

	Non-mitigated Alternative	Preferred Alternative	No Go Option
Probability of occurrence	Highly probable; Due to the combination of noise disturbance adjacent to the thicket vegetation, and increased predation, this species would very likely abandon the site for a number of years.	Probable; If the impacts (particularly of predation) are mitigated, there is a low likelihood that this species will be impacted severely.	Probable; It is difficult to quantify the likely impacts on this species if AIPs increase in abundance, as the exotic vegetation decreases feeding and breeding habitat, but could still act as a corridor for dispersal.
Degree to which the impact may cause irreplaceable loss of resources	If unmitigated, this could result in the local disappearance of the species from the study area, and likely hamper movement of the species across the landscape.	With mitigation measures, the impacts are less severe, and with correct application of the mitigation measures, the long-term impacts would be negligible, and this property could act as a source population for the surrounding areas.	If invasion by AIPs increase to the extent that indigenous thicket vegetation is replaced by AIPs, the loss of habitat and feeding resources would be difficult and expensive to reverse.
Degree to which the impact can be reversed	If predation by cats is impacting this species at the study area, the removal of all cats from the property could reverse these impacts (if the habitat is still in good enough condition to support this species).	If predation by cats is impacting this species at the study area, the removal of all cats from the property could reverse these impacts (if the habitat is still in good enough condition to support this species).	Difficult to reverse if the area has a very high density of AIPs and the habitat is no longer suitable for the species.
Indirect impacts	None	None	None
Cumulative impact prior to mitigation	High (-)	Medium (-)	Medium to High (-)

	Non-mitigated Alternative	Preferred Alternative	No Go Option
Significance rating of impact prior to mitigation	High (-)	Medium (-)	Medium to High (-)
Can these impacts be mitigated?	Yes	Yes	Not in this scenario
Proposed mitigation	No free-roaming domestic cats on the property (i.e., all cats must be housebound, especially during the breeding season of September-December). No removal of indigenous thicket vegetation Removal of AIPs, particularly in the thicket vegetation. If trails are developed through the thicket vegetation (see Recommendations section), these trails must keep the thicket vegetation as intact as possible (especially adjacent to the stream that flows through the property)		
Degree of confidence	High	High	Medium (uncertain about how significant the impact of AIPs will be on this SCC)
Significance of impacts on the development	High (No development in or adjacent to the thicket vegetation; no domestic or feral cats on the property)		

c) Eastern Red Copper, *Aloeides thyra orientis*, and Coastal Blue, *Lepidochrysops littoralis*

Aloeides thyra orientis is unlikely to be impacted by this development, as it likely does not occur at the property. If it is present without being detected during the two site visits, it could be impacted by residents spraying pesticides, and a potential absence of suitable habitat (especially if the no-go option occurs, and *A. mearnsii* and *A. cyclops* invades previously-cleared areas). A mitigation measure (for this species, *L. littoralis* and other fynbos butterfly species) is to maintain a section of intact fynbos with indigenous larval host plants (*Selago*, *Indigofera*, *Aspalathus*, etc.) in a section of the property away from the houses (in lower disturbance areas). Figure 9 suggests areas on the property that may be suitable for this type of vegetation. Though the use of fire to maintain this section of fynbos vegetation is preferred (but difficult to implement), rejuvenation of this vegetation could be stimulated by brushcutting the vegetation once every ten years, to simulate the removal of plant cover by fire. Another

mitigation measure could be to prohibit the use of pesticides that are not pollinator-friendly, as these are less likely to affect the adult butterflies (but would still impact their larval stages).

Lepidochrysops littoralis (if this species in present at the study area, but undetected during the two site visits, which is very unlikely) is likely to be impacted by the operational phase of this development in a manner similar to *A. thyra orientis*. As a result, the same mitigation measures (prohibiting the use of pollinator-unfriendly pesticides, and establishing and maintaining a section of fynbos vegetation with larval host plants in a section of the property where disturbance is unlikely) apply to mitigate the potential impacts on this SCC.

Table 8: The likely impacts on *A. thyra orientis* and *L. littoralis* during the operational phase of the development, for the three alternatives.

	Non-mitigated Alternative	**Preferred Alternative**	**No Go Option**
Nature of impact	Very little habitat (and larval host plants) left, due to conversion of habitat into residential plots. Pesticide use in residential gardens may impact larvae and adults of these species.	Loss of a section of habitat, particularly in sections where there are potential larval host plants present. Some suitable habitat still remaining. Pesticide use could impact any larvae or adults in the area.	None, apart from potential habitat loss if the alien invasive plants (AIPs, mainly the exotic *Acacia* spp. and kikuyu grass, *Cenchrus clandestinum*) increase in abundance.
Extent and duration of impact	Largely confined to the study area; if pesticides are used frequently in gardens (especially pollinator-unfriendly pesticides), it would result in a drop in pollinators, including these butterflies (if they are indeed at the site). The reduction in suitable habitat also reduces the likelihood that this area can function as a corridor for the species. Likely long-term (6-15 years) impacts, considering the amount of vegetation removed for the development, and the number of residential plots in this SDP.	Largely confined to the study area; if too much fynbos vegetation is replaced by residential units, it would hamper the ability of the vegetation to sustain the larvae and adults of these species (if they are present at the site), and the mobility of these species in the surrounding landscape. Pesticide use, especially in gardens adjacent to the green spaces, could decrease pollinator abundance in the area. Likely long-term (6-15 years) impacts, considering the amount of vegetation altered for the development.	If left unchecked, AIPs (*Acacia* spp., and kikuyu grass) would likely alter the habitat to the extent that it could not support these species at all if they do occur in the area. Likely long-term (6-15 years) impacts, especially if there is a high amount of habitat transformation due to AIPs.

	Non-mitigated Alternative	**Preferred Alternative**	**No Go Option**
Consequences of impact or risk	High, destructive impact; Without suitable habitat, these butterflies are highly unlikely to occur at the site (if they are present but undetected).	Medium, destructive impact; Habitat transformation and habitat destruction will impact these species (if they are present but undetected). However, with some areas remaining as green space, there are still remnants of suitable habitat present.	Medium, destructive impact; Impacts are likely less severe than for *B. sylvaticus*, but if the existing vegetation with suitable larval food is replaced by stands of AIPs, there would be no suitable habitats left for these species.
Probability of occurrence	Highly probable; Due to habitat loss, these species would likely disappear from the site, if they are present but were not detected during the site visits.	Probable; If, as per this SDP, there is ample green space present on the property, with suitable habitat, the likelihood of these impacts occurring is less than without mitigation.	Probable; It is difficult to quantify the likely impacts on these species if AIPs increase in abundance, as the exotic vegetation decreases feeding and breeding habitat, but the extent to which these species will be affected (if they are present) is difficult to quantify.
Degree to which the impact may cause irreplaceable loss of resources	If unmitigated, this could result in the local disappearance of these (and other butterfly) species from the study area, if they are present.	With mitigation measures, the impacts are less severe, and with correct application of the mitigation measures, the long-term impacts would be reduced.	If invasion by AIPs increase to the extent that indigenous fynbos vegetation is replaced by AIPs, the loss of habitat and feeding resources would be difficult and expensive to replace.

	Non-mitigated Alternative	**Preferred Alternative**	**No Go Option**
Degree to which the impact can be reversed	Habitat loss would be near impossible to replace/reverse. If the preferred habitat is still present post-development, the maintenance of the fynbos vegetation for these (and other) butterfly species could largely reverse the impacts of the development.	With reduced habitat loss, and mitigating the negative impacts by limiting construction to demarcated areas (and keeping some fynbos vegetation intact), the impacts can be reversed relatively easily.	Difficult and expensive to reverse if the area has a very high density of AIPs and the habitat is no longer suitable for these species.
Indirect impacts	None	None	None
Cumulative impact prior to mitigation	High (-)	Medium (-)	Medium to High (-)
Significance rating of impact prior to mitigation	High (-)	Medium (-)	Medium to High (-)
Can these impacts be mitigated?	Yes	Yes	Not in this scenario
Proposed mitigation	Conservation of some intact fynbos vegetation with larval food plants. Planting suitable larval host plants and butterfly feeding plants in residents' gardens, and promoting planting of indigenous flowering plants in residents' gardens.		
Degree of confidence	Medium (not certain whether these species are absent from the site or simply unrecorded during the site visits)	Medium (not certain whether these species are absent from the site or simply unrecorded during the site visits)	Medium (not certain whether these species are absent from the site or simply unrecorded during the site visits)
Significance of impacts on the development	High (Some fynbos vegetation should be left as part of the green belt)		

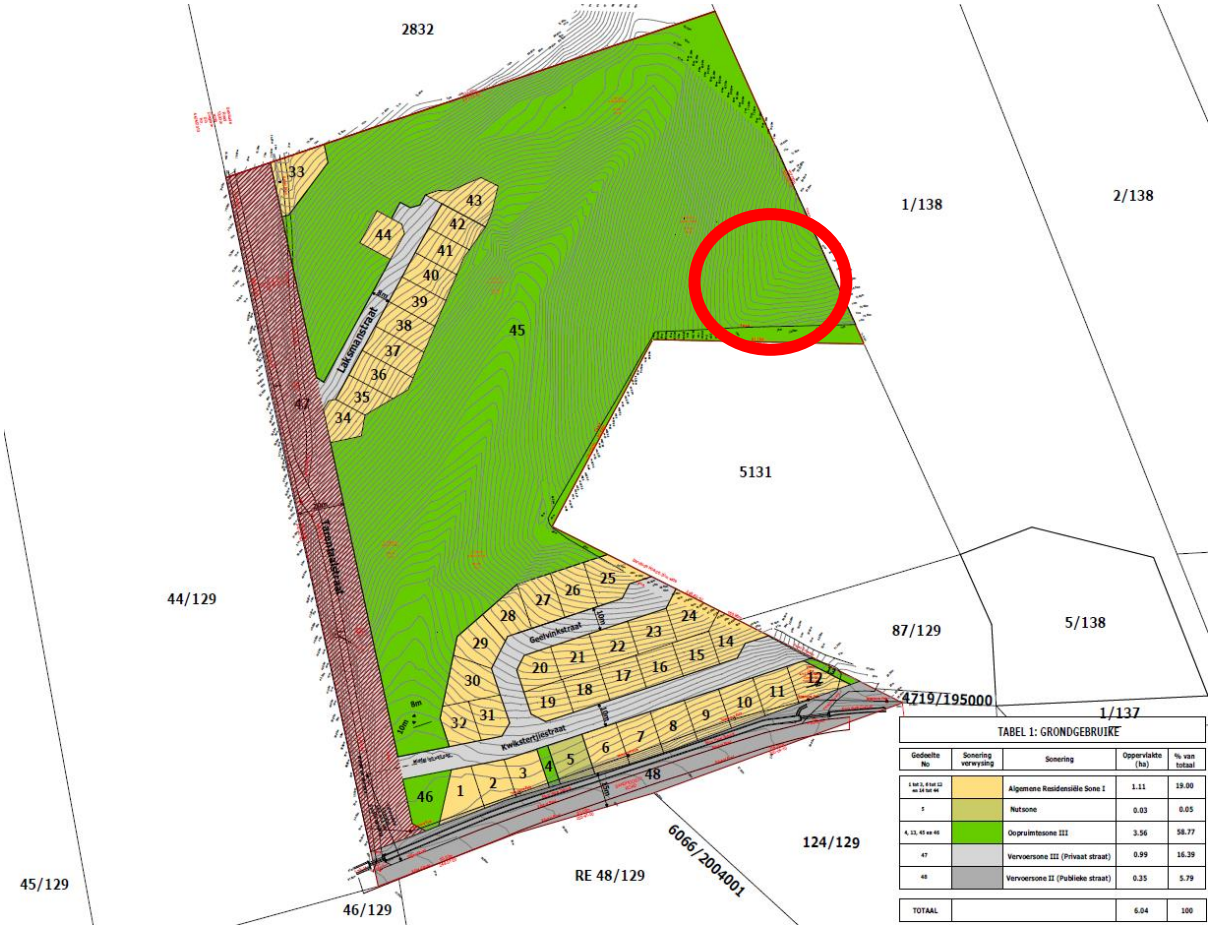

Fig. 9: The preferred SDP, with the design including mitigation measures recommended by the site sensitivity verification reports. The green areas are sections of the property where natural vegetation will be present as "green space". The northeastern corner (circled in red) is an area where exotic *Acacia* trees have been removed. If this section is kept free of AIPs, and fynbos vegetation allowed to establish, it would be suitable as a butterfly-friendly section of the property.

d) Sensitive Species 8

Sensitive Species 8, if it occurs at the study site but was undetected during the site visits, will be impacted through reduced mobility, and disturbance by humans and dogs. Priority should be given to determine whether this species is present at the site, by using camera traps, or the ECO investigating the funnels within the fence to detect this species moving through these funnels. If this species is present, they are most likely to occur in the thicket vegetation, and their movements will be hampered by the fence around the property. In such a case, it is recommended that mammal gaps (or funnels), approximately 20 cm wide and 30 cm wide, be placed in the fenceline when the fence is constructed. These gaps should be placed in areas where animals are likely to move, such as along the thicket vegetation, but should not be placed along the main road to the south of the property. It is also recommended that the use of these funnels are monitored with camera traps (or site visits by the ECO) 6 months after construction, to determine the use thereof by local wildlife. Prohibiting free-roaming pets on the property is also an important mitigation measure, to reduce the likelihood of mortality occurring due to pets. The continued removal of exotic *Acacia* species is also an important mitigation measure, as the reduction in understorey vegetation associated with an invasion by these trees will impact these animals negatively.

Table 9: The likely impacts on Sensitive Species 8 during the operational phase of the development, for the three alternatives.

	Non-mitigated Alternative	**Preferred Alternative**	**No Go Option**
Nature of impact	Loss of a section of habitat, particularly the dense thicket vegetation. Also, noise disturbance associated with residents on the property. Reduction in mobility associated with fencing of the property, and potential increase in mortality associated with pets.	Little loss of thicket habitat, but noise disturbance associated with residents and their pets. Reduction in mobility associated with fencing of the property, and a potential increase in predation caused by pets.	None, apart from potential habitat loss if the alien invasive plants (AIPs, mainly the exotic *A. cyclops* and *A. mearnsii*) increase in abundance.
Extent and duration of impact	Largely confined to the study area; if too much thicket vegetation is removed, it would hamper the ability of the vegetation to sustain this species, and the mobility of this species in the surrounding landscape. Likely long-term (6-15 years) impacts, considering the amount of vegetation removed for the development.	Largely confined to the study area; there is little reduction in suitable habitat, but the mobility of this species in the surrounding landscape may still be reduced. Likely long-term (6-15 years) impacts, considering the degree to which mobility is hampered, and the initial disturbance associated with new residents moving into the properties.	If left unchecked AIPs (*Acacia* spp.) would likely alter the habitat to the extent that it could not support these species in terms of food, if they do occur in the area. Likely long-term (6-15 years) impacts, especially if there is a high amount of habitat transformation due to AIPs.

	Non-mitigated Alternative	**Preferred Alternative**	**No Go Option**
Consequences of impact or risk	High, destructive impact; The reduction in suitable habitat (thicket), along with a reduction of mobility associated with fencing of the property is likely to lead to a reduction in the survivability of this species at the site, if they occur there but are undetected). In such a small population, the impacts of even a single additional mortality due to dogs and cats, may result in a loss of the species on-site.	Medium, destructive impact; The potential noise disturbance associated with residents, along with a reduction of mobility associated with fencing of the property is likely to lead to a reduction in the survivability of this species at the site (especially if coupled with potential mortality caused by pets), if they occur there but are undetected.	Medium, destructive impact; Impacts are likely less severe than for *B. sylvaticus*, but if the existing thicket vegetation is replaced by stands of AIPs, there would be no preferred habitat left on the property for this species.
Probability of occurrence	Probable; This species may abandon this property during the construction phase, but may be unable to move back into the thicket vegetation on the property if the fenceline excludes them.	Probable; If, as per this SDP, there is ample green space present on the property, with suitable habitat, the likelihood of these impacts occurring is less than without mitigation.	Probable; It is difficult to quantify the likely impacts on this species if AIPs increase in abundance, as the exotic vegetation decreases feeding and breeding habitat.
Degree to which the impact may cause irreplaceable loss of resources	If unmitigated, this could result in the eventual local disappearance of this species from the study area, if it is present.	With mitigation measures, the impacts are less severe, and with correct application of the mitigation measures, the long-	If invasion by AIPs increase to the extent that indigenous thicket vegetation is replaced by AIPs, the loss of habitat and feeding resources would be

		term impacts would be negligible.	difficult and expensive to replace.
	Non-mitigated Alternative	**Preferred Alternative**	**No Go Option**
Degree to which the impact can be reversed	Habitat loss would be near impossible to replace/reverse. If the preferred habitat is still present post-development, the maintenance of the thicket vegetation (in terms of AIP clearing) for this species could reverse the impacts of the development.	With negligible habitat loss, and mitigating the negative impacts by limiting construction (and therefore noise disturbances associated with residents) to demarcated areas, the impacts can be reversed moderately easily.	Difficult to reverse if the area has a very high density of AIPs and the habitat is no longer suitable for this species.
Indirect impacts	None	None	None
Cumulative impact prior to mitigation	High (-)	Medium (-)	Medium to High (-)
Significance rating of impact prior to mitigation	High (-)	Medium (-)	Medium to High (-)
	Non-mitigated Alternative	**Preferred Alternative**	**No Go Option**
Can these impacts be mitigated?	Yes	Yes	Not in this scenario
Proposed mitigation	Conservation and management (e.g. removal of AIPs) of thicket vegetation. Using a fence that allows this species to move through, while still excluding human trespassers. No free-roaming pets (cats and dogs) on the property, to prevent pet-induced mortalities. This includes no free-roaming dogs on any trails constructed on the property.		
Degree of confidence	Medium (not certain whether this species is absent from the site or simply unrecorded during the site visits)	Medium (not certain whether this species is absent from the site or simply unrecorded during the site visits)	Medium (not certain whether this species is absent from the site or simply unrecorded during the site visits)

Significance of impacts on the development	High (Thicket vegetation should be left undisturbed apart from AIP removal, the fence around the property should allow this species to move through the area, and pets should not be free-roaming on the property.

e) Yellow-winged Agile Grasshopper, *Aneuryphymus montanus*

Aneuryphymus montanus is highly unlikely to occur at the study area, due to the absence of preferred substrate and vegetation, and the absence of records of this species in a 50 km radius. Though the occurrence of this species at the study area is highly unlikely, the preservation of pockets of indigenous vegetation (as with the two butterfly species) will mitigate any impacts this development may have on this species (however unlikely its presence at the site may be).

5.3. Comparison of the three alternatives

Of the three options (non-mitigated alternative, preferred alternative, and no-go option), the preferred alternative will have the lowest impact on the SCC that is present at the site (*B. sylvaticus*) and the SCC that could be present at the site, though they were not detected during the site visits (Sensitive Species 8, *A. thyra orientis* and *L. littoralis*). Though no development may benefit the SCC, there is also an abundance of AIPs on the property, which would likely alter the fynbos and thicket habitat sufficiently to reduce the suitability of these habitats for the SCC. With the preferred alternative, there is ample designated green space to permit animal movement through the landscape, as well as provide suitable feeding and nesting habitat.

5.4. Site sensitivity verification

The DFFE screening tool flagged the development as having a **High** sensitivity in terms of the terrestrial animal species theme, due to the potential presence of six species of conservation concern. The site visit indicated that the vegetation at the site is highly unlikely to support populations of *Aneuryphymus montanus* and *Circus ranivorus*. It is also unlikely that the site supports populations of Sensitive Species 8, *A. thyra orientis* and *L. littoralis*, though there is a chance that the thicket vegetation could provide shelter for the former, and the fynbos vegetation could support the latter two species (though the presence of the two butterfly species on the property is very unlikely). There is, however, a high likelihood that *Bradypterus sylvaticus* occurs at the site, and will be impacted by the development.

Due to the presence of *B. sylvaticus* at the site, but the absence of the other species of conservation concern, the site sensitivity should be considered **High**. The sections of the property that are proposed for the development vary between the non-mitigated alternative and preferred alternative, with more areas potentially under construction with the non-mitigated alternative. Most of these areas have already been transformed through alien invasive plants (notably the southern section, northwestern and eastern sections of the site), and the development is unlikely to have a major impact on SCC in these sections of the site if sufficient indigenous vegetation remain.

A sensitivity map has been drawn up for the property (Fig. 10). The sections that have been proposed for development generally has a low sensitivity (green), but the seasonal stream has been designated as high sensitivity (red), and the adjacent thickets as medium density (yellow). Apart from the removal of exotic trees within these more sensitive areas, they should not be disturbed further.

The seasonal stream is regarded as high sensitivity, due to the high likelihood that this is an important ecological corridor, particularly for *Bradypterus sylvaticus*, which has a high likelihood of occurring in this area. Though Sensitive Species 8 was not recorded at the site, if it does occur here, it will likely be in the thickets along the stream. The area immediately around the stream vegetation is regarded as medium sensitivity, as disturbances here will likely impact the ecological corridor, and activities/disturbances here should be restricted. The remainder of the site has a low sensitivity, due to no SCC being detected in these areas, low likelihood of the SCC occurring there or using those areas as corridors, and high degrees of habitat alteration or high rates of invasion by exotic plants recorded there.

Table 10: The post-mitigation sensitivity (significance), mitigation measures, and post-mitigation significance of the six SCC, as they may be influenced by this development. "Initial sensitivity" is based on the screening tool report's sensitivity, and "Post-mitigation sensitivity" refers to the significance of the impacts the development will have on each species, if mitigation measures are implemented.

Species	**Initial sensitivity**	**Mitigation measures**	**Post-mitigation significance**
African marsh-harrier, *Circus ranivorus*	High	N/A (not present at site)	Low
Knysna warbler, *Bradypterus sylvaticus*	High	• No removal of indigenous thickets • Construction only outside the breeding season (which is August-November) • No free-roaming cats and dogs on property • Removal of AIPs in indigenous thicket vegetation	Medium
Coastal blue, *Lepidochrysops littoralis*	Medium	• Conservation of some fynbos vegetation in the green space • Planting of suitable larval host plants in residents' gardens • Pesticides used (especially in gardens) must be pollinator-friendly	Low
Brenton copper, *Aloeides thyra orientis*	Medium		Low

Sensitive Species 8 (which cannot be disclosed)	Medium	• No removal of indigenous thicket vegetation • No free-roaming cats and dogs on property • Proper hoarding used to demarcate thicket that is not to be disturbed • No unsupervised workers on the property • Use of wildlife funnels to allow movement through the fence	Medium
Yellow-winged agile grasshopper, *Aneuryphymus montanus*	Medium	N/A (not present at site)	Low

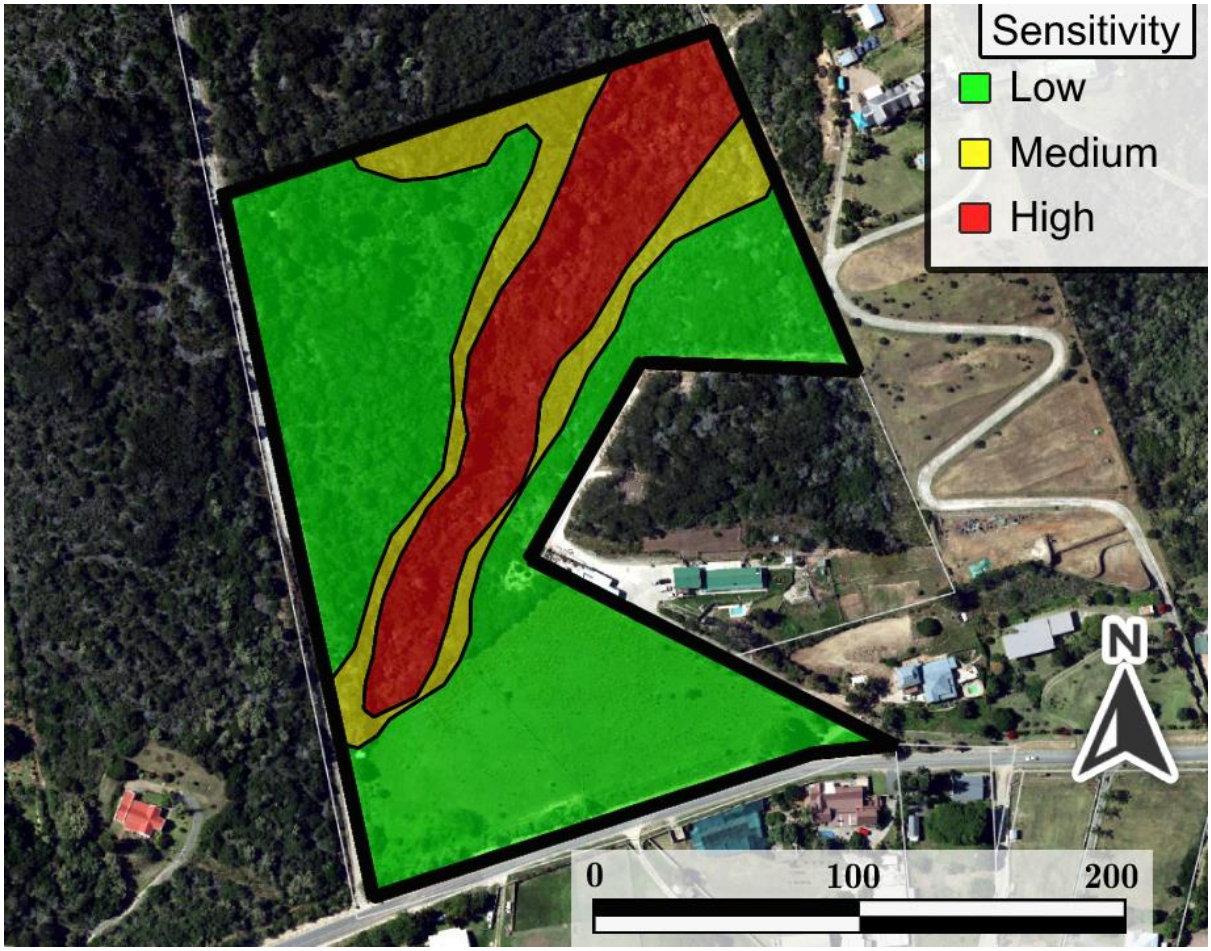

Fig. 10: The sensitivity map of RE2833, with low (green), medium (yellow) and high (red) sensitivities indicated.

6. RECOMMENDATIONS

Based on the high probability that *Bradypterus sylvaticus* uses the seasonal stream that bisects the property as an ecological corridor, the areas highlighted as high sensitivity should not be disturbed further apart from the removal of the exotic vegetation still present there, and the promotion of natural, indigenous vegetation establishment. This area is an important ecological corridor, and should be treated as such.

If trails on the estate are planned, care should be taken when crossing through the thicket vegetation. It is advised that the exotic plants in this vegetation is removed, and the trail follow the section that previously had the highest density of AIPs. This will reduce the disturbance in intact thicket vegetation, while also allowing easy access for follow-up clearing of AIPs.

As discussed in terms of the development's impacts on the SCC, it is important that pets be housebound (no free-roaming cats and dogs). Additionally, putting up signage to inform homeowners of the impact their pets could have on this bird species, could increase awareness and environmental consciousness of those living on the property. Dogs that are not housebound should be enclosed in a fenced area, to prevent access to more sensitive areas on the property.

Reducing the use of pesticides in gardens would also benefit the two butterfly species of conservation concern that could occur at the site. Ensuring that some fynbos vegetation with suitable larval food plants will also potentially benefit these (and other) species.

Lastly, it is recommended that the presence or absence of Sensitive Species 8 should be determined with the use of camera traps, or by the appointed ECO scouring the property for signs of this species. It is also recommended that mammal-funnels are placed in the fenceline, at places where there is a high likelihood of species such as Sensitive Species 8 moving through the landscape. These mammal-funnels should be monitored (with camera traps, or the ECO visiting each funnel) during the construction phase, as well as 6 months after construction. If individuals of Sensitive Species 8 are

unable to move through the fenceline, the risk of inbreeding is high, and they may not be able to access sufficient food or escape from predators, which could have further detrimental impacts on this species. Prof. Jan Venter has indicated his willingness to, for a fee, perform the monitoring of these funnels with camera traps, which is less labour- and time-intensive than performing weekly visits to the funnels.

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APPENDIX 1: The removal of exotic *Acacia mearnsii* and *A. cyclops* on RE2833, as recorded in aerial imagery, for (A) May 2021; (B) November 2021; March 2022; and (D) August 2022.

APPENDIX 2: The terrestrial animal species recorded at RE2833, during the site visit of 26 March 2023

Common name	Scientific name	Recorded	
Birds		**March 2023**	**November 2023**
Apalis, Bar-throated	*Apalis thoracica*		X
Bishop, Yellow	*Euplectes capensis*		X
Boubou, Southern	*Laniarius ferrugineus*		X
Brownbul, Terrestrial	*Phyllastrephus terrestris*		X
Bulbul, Cape	*Pycnonotus capensis*	X	
Canary, Cape	*Serinus canicollis*		X
Coucal, Burchell's	*Centropus superciliosus*		X
Dove, Red-eyed	*Streptopelia semitorquata*		X
Flycatcher, African dusky	*Muscicapa adusta*	X	
Greenbul, Sombre	*Andropadus importunus*		X
Guineafowl, Helmeted	*Numida meleagris*	X	X
Martin, Rock	*Ptyonoprogne fuligula*		X
Mousebird, Speckled	*Colius striatus*		X
Prinia, Karoo	*Prinia maculosa*	X	X
Robin-chat, Cape	*Cossypha capensis*		X
Seedeater, Streaky-headed	*Crithagra gularis*		X
Sparrow, Cape	*Passer melanurus*		X
Starling, Common	*Sturnus vulgaris*		X
Spurfowl, Cape	*Pternistis capensis*	X	X
Sunbird, Greater double-collared	*Cinnyris afer*	X	
Sunbird, Malachite	*Nectarinia famosa*		X
Sunbird, Southern double-collared	*Cinnyris chalybeus*		X
Swallow, Greater striped	*Cecropis cucullata*	X	
Warbler, Knysna*	*Bradypterus sylvaticus*	X*	
Waxbill, Common	*Estrilda astrild*		X

Weaver, Cape	*Ploceus capensis*		X
White-eye, Cape	*Zosterops virens*	X	X
Whydah, Pin-tailed	*Vidua macroura*		X
Woodpecker, Olive	*Chloropicus griseocephalus*	X	
Insects: Beetles (Coleoptera)			
Beetle, Longhorn	*Erioderus* sp.	X	
Beetle, Common metallic longhorn	*Promeces longipes*		X
Insects: Bugs (Hemiptera)			
Bug, Leaf-footed	*Acanthocoris* sp.	X	
Insects: Wasps, bees and ants (Hymenoptera)			
Bee, Double-banded carpenter	*Xylocopa caffra*		X
Insects: Butterflies & Moths (Lepidoptera)			
Border, Common dotted	*Mylothris agathina agathina*	X	
Brown, Rainforest	*Cassionympha cassius*		X
Monarch, African	*Danaus chrysippus*	X	
Painted lady	*Vanessa cardui*		X
White, Meadow	*Pontia helice*		X
Widow, Cape autumn	*Dira clytus*	X	
Insects: Grasshoppers and Crickets (Orthoptera)			
Locust, Garden	*Acanthacris ruficornis*	X	
Mammals			
Bushbuck	*Tragelaphus sylvaticus*	X	X
Mouse, Striped field	*Rhabdomys pumilio*	X	
Porcupine, Cape	*Hystrix africaeaustralis*		X

*Not recorded on the site, but in a property directly adjacent to the site.

APPENDIX 3: The vegetation at the northwestern corner of the property, where exotics have been cleared, and indigenous shrubs and trees are regrowing (centred on S 34° 3'16.36"; E 22°12'8.61")

APPENDIX 4: The vegetation characteristic of the thicket vegetation along the stream that bisects the property (centred on S 34° 3'17.26"; E 22°12'12.47")

APPENDIX 5: The vegetation characteristic of the areas where alien invasive plants (exotic *Acacia* spp.) have been removed. Photos taken in the area centred around S 34° 3'18.90"; E 22°12'10.00".

APPENDIX 5: The vegetation characteristic of the grassy, southern section of the property (centred around S 34° 3'22.68"; E 22°12'11.39")