

**TERRESTRIAL FAUNAL AND AVIFAUNAL SPECIES COMPLIANCE
STATEMENT REPORT FOR THE PROPOSED HARTENBOS WASTE
WATER TREATMENT WORKS PV SOLAR PLANT ON REMAINDER
OF PORTION 101 OF THE FARM HARTENBOSCH 217, MOSSEL
BAY, MOSSEL BAY MUNICIPALITY**

September 2023



Prepared for:

Sharples Environmental Services cc (SES)

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Table of contents

Specialist details and expertise	1
Declaration of independence by the independent person who compiled a specialist report or undertook a specialist process	3
1. Introduction	5
2. Terms of Reference	5
2.1. <i>General legislature pertaining to this report</i>	5
2.2. <i>Other sources consulted</i>	6
3. Reporting protocol	6
4. Overview of the study area	8
4.1 <i>Geographic location</i>	8
4.2 <i>Topology</i>	10
4.3 <i>Vegetation</i>	10
4.4 <i>Land cover</i>	11
4.5 <i>Wetlands and rivers</i>	12
4.5 <i>Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs)</i>	13
4.7 <i>Ecosystem threat status</i>	14
5. Study methodology	15
5.1 <i>Study aims</i>	15
5.2 <i>Desktop assessment</i>	16
5.2.1 <i>Mammals</i>	16
5.2.2 <i>Avifauna</i>	17
5.3 <i>Field survey</i>	17

6. Assumptions and limitations	22
7. Faunal habitat types within the study area	22
8. Faunal and avifaunal composition within the study area	26
<i>8.1 Mammals</i>	26
8.1.1 Desktop assessment	26
8.1.2 Field survey	26
<i>8.2 Avifauna</i>	29
8.2.1 Desktop assessment	29
8.2.2 Field survey	30
<i>8.3 Grasshoppers</i>	34
<i>8.4 Faunal and avifaunal diversity within the study area</i>	34
9. Species of Conservation Concern	35
10. Evaluation of Site Ecological Importance (SEI)	39
<i>10.1 Evaluating SEI for habitats in the study area</i>	39
<i>10.2 SEI of the habitat in the study area</i>	44
11. Current impacts, project-related impacts, mitigation measures and development alternatives	47
<i>11.1 Current impacts</i>	47
<i>11.2 Anticipated project impacts</i>	47
12. Conclusion	50
<i>12.1 Listed sensitivity in the DFFE Screening Tool Report</i>	50
<i>12.2 Overlap with an Ecological Support Area (ESA)</i>	50

12.3 Conclusion	50
13. Conditions to which this statement is subjected	52
14. References	54
Appendix A	61
Appendix B	64
Appendix C	74
Appendix D	76

List of figures

Figure 1 Relative Animal Species Sensitivity Map retrieved for the study area (Red polygon = Study area) by the DFFE Screening Tool (https://screening.environment.gov.za/screeningtool/).	7
Figure 2 Spatial location of the study area relative to surrounding residential areas and main roads on a broad scale (Red polygon = Study area; map generated in Cape Farm Mapper version 3, Western Cape Department of Agriculture).	9
Figure 3 Spatial extent of the study area at a finer scale (Red polygon = Study area; map generated in Cape Farm Mapper version 3, Western Cape Department of Agriculture).	9
Figure 4 Topology of the study area showing 5 meter contour lines (Red polygon = Study area; map generated in Cape Farm Mapper version 3, Western Cape Department of Agriculture).	10
Figure 5 Vegetation type across the study area (VEGMAP, SANBI 2018; Red polygon = Study area; map generated in Cape Farm Mapper version 3, Western Cape Department of Agriculture).	11

Figure 6 Land cover (Land Cover 73-class, Department of Environmental Affairs, 2020) within the study area (Red polygon = Study area; information sourced from Cape Farm Mapper version 3, Western Cape Department of Agriculture).	12
Figure 7 Distribution of wetlands (NFEPA) and rivers relative to the study area (Red polygon = Study area; map generated in Cape Farm Mapper version 3, Western Cape Department of Agriculture).	13
Figure 8 Spatial location of terrestrial Ecological Support Areas (ESAs) overlapping with the study area (Red polygon = Study area; information sourced from Cape Farm Mapper version 3, Western Cape Department of Agriculture).	14
Figure 9 Spatial location of the ecosystem and its threat status according to <i>The National List of Ecosystems that are Threatened and Need of Protection</i> (Government Gazette, 2011), overlapping with the study area (Red polygon = Study area; information sourced from Cape Farm Mapper version 3, Western Cape Department of Agriculture).	15
Figure 10 Weather conditions in the study area over the surveying period (08 September 2023). The time of day is indicated, along with the temperature (in °C), percentage cloud cover and wind speed (in km/h) (weather data sourced from https://www.worldweatheronline.com).	19
Figure 11 Spatial tracks recorded by GPS for all the search meanders across the study area over the surveying period.	20
Figure 12 Spatial locations of all the faunal observations across the study area over the surveying period.	21
Figure 13 A broad indication of the spatial extent of habitat types in the study area landscape. Photo localities (A and B) correspond to the habitat photos in Table 2.	23
Figure 14 Spatial locations of the different mammal species recorded within the study area.	28
Figure 15 Photographic evidence of the different mammal species recorded in the study area. A) Scat of the Common Duiker (<i>Sylvicapra grimmia</i>). B) Mounds of the African Mole-rat (<i>Cryptomys hottentotus</i>).	29
Figure 16 Spatial locations of the different avifaunal species recorded within the study area.	31

Figure 17 Photographic evidence of different avifaunal species recorded in the study area. A) Egyptian Goose (*Alopochen aegyptiaca*). B) Blacksmith Lapwing (*Vanellus armatus*). C) Speckled Mousebird (*Colius striatus*). D) Speckled Pigeon (*Columba guinea*). E) Cape Turtle Dove (*Streptopelia capicola*). F) Red-eyed Dove (*Streptopelia semitorquata*). G) Helmeted Guineafowl (*Numida meleagris*). H) Grey-backed Cisticola (*Cisticola subruficapilla*). I) Levallant's Cisticola (*Cisticola tinniens*). J) Karoo Prinia (*Prinia maculosa*). K) Common Waxbill (*Estrilda astrild*). L) Brimstone Canary (*Crithagra sulphurata*). M) Cape Wagtail (*Motacilla capensis*). N) Cape Robin-Chat (*Cossypha caffra*). O) African Stonechat (*Saxicola torquatus*). P) Cape Sparrow (*Passer melanurus*). Q) Yellow Bishop (*Euplectes capensis*). R) Southern Red Bishop (*Euplectes orix*). S) Cape Weaver (*Ploceus capensis*). T) Cape Bulbul (*Pycnonotus capensis*). U) Red-winged Starling (*Onychognathus morio*). V) Common Starling (*Sturnus vulgaris*). W) Intermediate Egret (*Ardea intermedia*). X) African Sacred Ibis (*Threskiornis aethiopicus*). 32

Figure 18 Spatial representation of the SEI for the single habitat within the study area. 46

Figure 19 “Constraints and Opportunities” map of the study area landscape showing areas which are of a lower sensitivity and are therefore suitable for potential development. 49

List of tables

Table 1 List of Species of Conservation Concern (SCC) identified in the DFFE Screening Tool Report (<https://screening.environment.gov.za/screeningtool/>). For each, the listed sensitivity (possibility of occurrence within the study area), scientific name and common name is shown, along with its current IUCN status. The names of “Sensitive Species 8” and “Sensitive Species 5” are purposefully omitted, given the sensitivity of these species. 8

Table 2 Habitat locations, habitat descriptions and visual representations of the different habitat types within the study area. Location designations (A and B) correspond to the photo locations in Figure 13. 24

Table 3 Probability of occurrence of specific SCC in the study area. For each species, the taxonomic Family, scientific name and common name is shown, along

with its current classification under the IUCN Red List of Threatened Species (IUCN, 2021). In addition, the probability that the species occurs within the study area is given, along with a justification for listing this probability.	36
Table 4 Conservation importance (CI) criteria (table adapted from the Species Environmental Assessment Guideline, SANBI, 2020).	40
Table 5 Functional integrity (FI) criteria (table adapted from the Species Environmental Assessment Guideline, SANBI, 2020).	41
Table 6 Matrix for calculating Biodiversity Importance (BI) (table adapted from the Species Environmental Assessment Guideline, SANBI, 2020).	42
Table 7 Receptor Resilience (RR) criteria (table adapted from the Species Environmental Assessment Guideline, SANBI, 2020).	42
Table 8 Matrix for calculating Site Ecological Importance (SEI) (table adapted from the Species Environmental Assessment Guideline, SANBI, 2020).	43
Table 9 Guidelines for interpreting SEI in the context of the proposed development activities (table adapted from the Species Environmental Assessment Guideline, SANBI, 2020).	43
Table 10 Evaluation of SEI for habitats within the study area landscape. BI = Biodiversity Importance, RR = Receptor Resilience.	45
Appendix A Desktop species list of the mammal species which have a distribution overlapping with the study area (constructed with reference to Skinner and Chimimba, 2005). Species in bold have been previously recorded within the study area landscape (QDGS: 3422AA, MammalMAP, https://vmus.adu.org.za/ ; iNaturalist, www.iNaturalist.org). For each species, the taxonomic Order, Family, species binomial name and common name is shown, along with the current IUCN Red List classification of the species.	61
Appendix B Desktop species list of the avifaunal species which have been recorded in the pentad (3405_2205) which overlaps the study area (the South African Bird Atlas Project 2, https://sabap2.birdmap.africa/). For each species, the taxonomic Order, Family, species binomial name and common name is shown, along with the current IUCN Red List classification of the species. In addition, the total number of observations for each species is shown, along with the latest date the species was recorded within the pentad. Species in bold represent avifaunal species of conservation concern (SCC).	64

Appendix C Species list of the faunal species recovered within the study area during the field survey. For each, the taxonomic Order, Family, species binomial name and species common name are shown, along with the current IUCN Red List classification of the species, and the number of records of the species during the surveying period.

74

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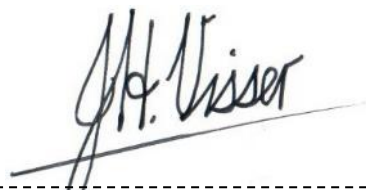
- Five IUCN Red List assessments
- Involved in the Southern African Bird Atlas Project 2 (SABAP2)
- Contributor on the National Biodiversity Assessment 2018: The status of South Africa's ecosystems and biodiversity. Synthesis Report. South African National Biodiversity Institute, an entity of the Department of Environment, Forestry and Fisheries, Pretoria.

Declaration of independence by the independent person who compiled a specialist report or undertook a specialist process

I, Dr Jacobus Hendrik Visser, as the appointed independent specialist hereby declare that I:

- act/ed as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations and any specific environmental management Act;
- have no and will not have any vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;

- have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence.



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TERRESTRIAL FAUNAL AND AVIFAUNAL SPECIES COMPLIANCE STATEMENT REPORT FOR THE PROPOSED HARTENBOS WASTE WATER TREATMENT WORKS PV SOLAR PLANT ON REMAINDER OF PORTION 101 OF THE FARM HARTENBOSCH 217, MOSSEL BAY, MOSSEL BAY MUNICIPALITY

1. Introduction

The applicant is proposing construction of the Hartenbos Waste Water Treatment Works (WWTW) PV Solar Plant on remainder of portion 101 of the Farm Hartenbosch 217, Mossel Bay, Mossel Bay Municipality, Western Cape (hereafter referred to as the “study area” or “site”). Blue Skies Research was appointed by Sharples Environmental Services cc (SES) on behalf of the applicant to perform the required terrestrial faunal and avifaunal assessment of the study area (see Sections 2 and 3). The current report represents a terrestrial faunal and avifaunal species compliance statement for the proposed development in accordance with the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment (EIA) Regulations 2014 (Government Notice (GN) 984), as amended.

2. Terms of Reference

2.1. General legislature pertaining to this report

This terrestrial faunal and avifaunal assessment report is compiled in accordance with the following guidelines:

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- *Department of Environmental Affairs and Development Planning (DEA&DP) Guidelines for Involving Biodiversity Specialists in the EIA Process* (Brownlie, 2005).
- *Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes, Government Notice No. 320* (Gazetted 20 March 2020).
- *Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species, Government Notice No. 1150* (Gazetted 30 October 2020).
- South African National Biodiversity Institute (SANBI). 2020. *Species Environmental Assessment Guideline. Guidelines for the implementation of the terrestrial fauna and terrestrial flora species protocols for environmental impact assessments in South Africa*. South African National Biodiversity Institute, Pretoria. Version 2.1 2021.

2.2 Other sources consulted

Other sources pertaining to this report are as follows:

- IUCN. 2021. The IUCN Red List of Threatened Species. Version 2021-3. <https://www.iucnlist.org>. Accessed on 25 September 2023.
- *National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004): Publication of lists of critically endangered, endangered, vulnerable and protected species, Government Notice No. 2007* (Gazetted 14 December 2007).

3. Reporting protocol

The DFFE Screening Tool Report generated for the proposed project footprint identifies the site as being of an overall “High” sensitivity under the “Relative Animal Species Sensitivity Theme” (Figure 1). This follows from the projected and possible occurrence of two mammal, two avifaunal and one invertebrate Species of Conservation Concern (SCC) (Table 1). The current report therefore assesses the

presence or likely presence of these mammal, avifaunal and invertebrate SCC (as well as other possible SCC within these faunal groups, see Section 9) within the study area in accordance with the protocols outlined in the Species Environmental Assessment Guideline (SANBI, 2020).

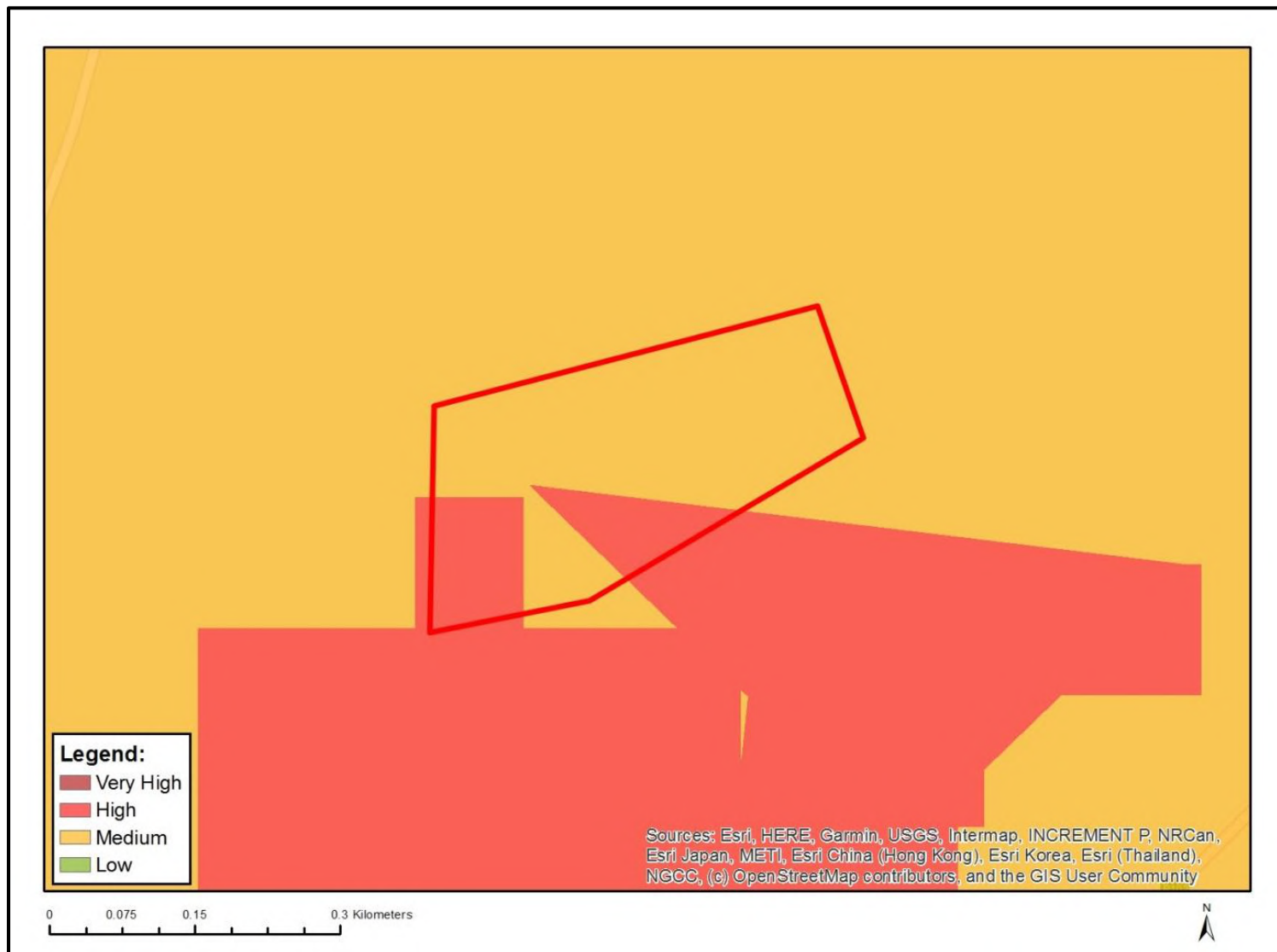


Figure 1 Relative Animal Species Sensitivity Map retrieved for the study area (Red polygon = Study area) by the DFFE Screening Tool

(<https://screening.environment.gov.za/screeningtool/>).

Table 1 List of Species of Conservation Concern (SCC) identified in the DFFE Screening Tool Report (<https://screening.environment.gov.za/screeningtool/>). For each, the listed sensitivity (possibility of occurrence within the study area), scientific name and common name is shown, along with its current IUCN status. The names of “Sensitive Species 8” and “Sensitive Species 5” are purposefully omitted, given the sensitivity of these species.

Sensitivity	Species	Common name	IUCN status
High	<i>Hydroprogne caspia</i>	Caspian Tern	Least Concern
High	<i>Bradypterus sylvaticus</i>	Knysna Warbler	Vulnerable
Medium	<i>Sensitive Species 5</i>	Sensitive Species 5	Least Concern
Medium	<i>Sensitive Species 8</i>	Sensitive Species 8	Least Concern
Medium	<i>Aneuryphymus montanus</i>	Yellow-winged Agile Grasshopper	Vulnerable

4. Overview of the study area

4.1 Geographic location

The project footprint is approximately 6.1 hectares in size, and is located around 1.5 kilometres north of the Hartenbos residential area, and directly adjacent to and to the north of the Hartenbos Waste Water Treatment Works (WWTW, Figures 2 and 3). The site is adjoined by a nursery to the north and the Monte Christo Road to the east, with further open farmland to the east. Judging by the soil texture and - composition, this area appears to have been a stockpile for dry waste from the Hartenbos WWTW (also see Section 7).



Figure 2 Spatial location of the study area relative to surrounding residential areas and main roads on a broad scale (Red polygon = Study area; map generated in Cape Farm Mapper version 3, Western Cape Department of Agriculture).



Figure 3 Spatial extent of the study area at a finer scale (Red polygon = Study area; map generated in Cape Farm Mapper version 3, Western Cape Department of Agriculture).

4.2 Topology

The study area slopes gently towards the south and towards the Hartenbos WWTW (Figure 4).



Figure 4 Topology of the study area showing 5 meter contour lines (Red polygon = Study area; map generated in Cape Farm Mapper version 3, Western Cape Department of Agriculture).

4.3 Vegetation

Vegetation on the site would have historically comprised Mossel Bay Shale Renosterveld (VegMap, 2018; Figure 5). Even so, almost none of this vegetation type remains on the site, given the apparent artificial nature this area (see Section 7).



Figure 5 Vegetation type across the study area (VEGMAP, SANBI 2018; Red polygon = Study area; map generated in Cape Farm Mapper version 3, Western Cape Department of Agriculture).

4.4 Land cover

Land cover across the study area constitutes fallow land and old fields (low shrub and trees) (Figure 6; Land Cover 73-class, Department of Environmental Affairs, 2020). Indeed, this designation of land cover was found to be accurate as the site exists in a transformed state by previous land use (Section 7).

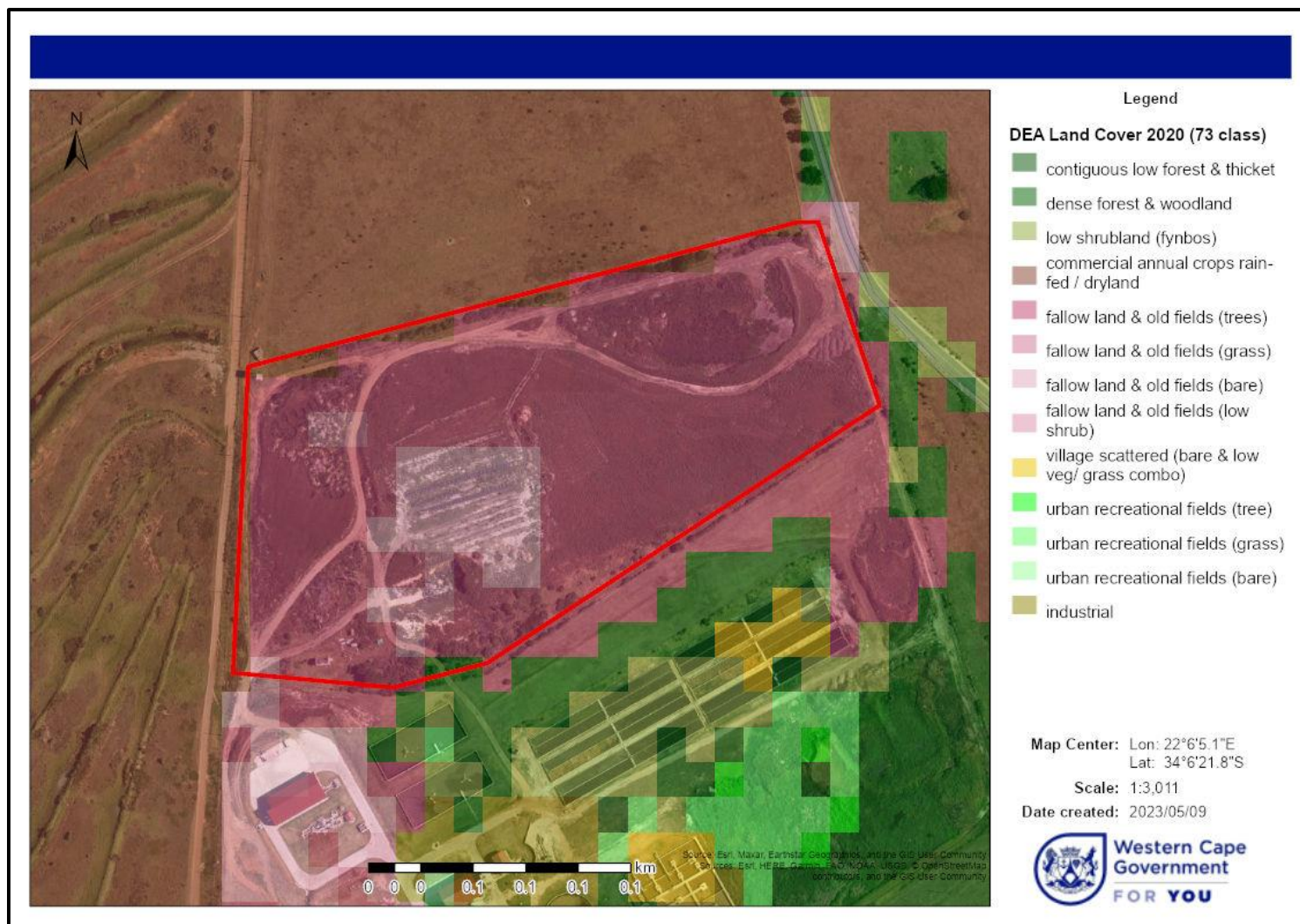


Figure 6 Land cover (Land Cover 73-class, Department of Environmental Affairs, 2020) within the study area (Red polygon = Study area; information sourced from Cape Farm Mapper version 3, Western Cape Department of Agriculture).

4.5 Wetlands and rivers

Overall, the site does not overlap with any notable water resources, although a small non-perennial stream centreline intersects the south-western corner of the site (Figure 7). According to the National Freshwater Ecosystem Priority Areas (NFEPA, CSIR et al. 2011), a channelled valley-bottom wetland is located to the south of the project footprint, however this area currently overlaps with the existing Hartenbos WWTW (Figure 7).



Figure 7 Distribution of wetlands (NFEPA) and rivers relative to the study area (Red polygon = Study area; map generated in Cape Farm Mapper version 3, Western Cape Department of Agriculture).

4.5 Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs)

Critical Biodiversity Areas (CBAs) are areas required to meet biodiversity targets for ecosystems, species and ecological processes, as identified in a systematic biodiversity plan (Purves and Holmes, 2015). Ecological Support Areas (ESAs) are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of CBAs and / or in delivering ecosystem services. Although the site does not overlap with any CBA, the entirety of the study area is designated as a terrestrial Ecological Support Area (ESA; Figure 8) owing to the historical presence of an “Endangered” ecosystem type (Subsection 4.6).



Figure 8 Spatial location of terrestrial Ecological Support Areas (ESAs) overlapping with the study area (Red polygon = Study area; information sourced from Cape Farm Mapper version 3, Western Cape Department of Agriculture).

4.6 Ecosystem threat status

According to *The National List of Ecosystems that are Threatened and Need of Protection* (Government Gazette, 2011), the project footprint overlaps with an “Endangered” ecosystem type, owing to the historical presence of Mossel Bay Shale Renosterveld (Figure 9). Even so, none of this vegetation or ecosystem type remains in the study area (Section 7).



Figure 9 Spatial location of the ecosystem and its threat status according to *The National List of Ecosystems that are Threatened and Need of Protection* (Government Gazette, 2011), overlapping with the study area (Red polygon = Study area; information sourced from Cape Farm Mapper version 3, Western Cape Department of Agriculture).

5. Study methodology

5.1 Study aims

This study represents an assessment of the terrestrial faunal and avifaunal diversity and abundances, -habitat composition, ecosystem dynamics and potential occurrence of mammal, avifaunal and invertebrate (and other) SCC within the study. As such, the aims of this investigation were to:

- 1.) Assess, define and create a spatial rendering of available faunal habitats across the study area landscape based on information gathered during the field survey as well as through a desktop assessment using the latest satellite imagery,
- 2.) compile a complete faunal desktop species list (including mammals and avifauna) for the study area landscape based on a thorough desktop assessment so as to assess the presence of any of the listed SCC (Table 1) as well as any additional SCC within these faunal groups,
- 3.) compile a faunal species list (including mammals and avifauna) within the study area through field surveying so as to assess the possibility of occurrence of the SCC retrieved in the desktop assessment (based on appropriate sampling methods, as well as the presence of suitable habitat for these species), or any additional SCC which are present on the site, and
- 4.) generate spatial occurrence maps for the recovered faunal species within the study area to assess the spatial extent of areas supporting higher levels of diversity, and possible SCC subpopulations and habitats which may be of conservation concern.

5.2 Desktop assessment

To assess the possible occurrence of the listed (Table 1) as well as any additional mammal and avifaunal SCC, a desktop assessment was performed to create a representative desktop species list for these faunal groups. Given the low number of records for grasshopper species, the presence or absence of the Yellow-winged Agile Grasshopper could only be evaluated during the field survey.

5.2.1 Mammals

The desktop species list for mammals (Appendix A) was constructed with reference to the distributional data available in Skinner and Chimimba (2005). This list was

further bolstered by referring to the observational records available on the MammalMAP (<https://vmus.adu.org.za/>) and iNaturalist (www.iNaturalist.org) platforms for the study area landscape (QDGS: 3422AA).

5.2.2 Avifauna

The desktop avifaunal species list for the study area was generated by referring to the species records of the South African Bird Atlas Project 2 (SABAP2, <https://sabap2.birdmap.africa/>) (Appendix B). The study area overlaps with one pentad (see below) which is well-represented in the atlassing cards:

Pentad: 3405_2205

Full protocol cards: 319

Ad-hoc protocol cards: 344

Total cards: 663

To create the avifaunal desktop species list for the study area, the species observed in this pentad were noted (see Appendix B), including the total number of observations (including both full and ad-hoc protocols), and also noting the latest date that the species was recorded within this pentad.

5.3 Field survey

The study area was surveyed on foot over a single day on the 8th of September 2023, during the Spring season. Weather conditions during the surveying period were characterised by relatively warm daily temperatures, low to no cloud cover during the day and moderate wind conditions (Figure 10).

Surveying included unconstrained point sampling through search meanders, as well active searching under rocks and debris. All tracks surveyed were recorded by GPS (Garmin eTrex® 10, Garmin International Inc, USA) and are represented in Figure 11. Terrestrial faunal species (mammals) were identified by direct visual observation,

or by their tracks, burrows, remains or scat. Avifaunal species were identified by visual observation, using a 180x zoom lens, or by auditory means. Finally, the presence or absence of the Yellow-winged Agile Grasshopper was evaluated based on suitable habitat for this species (recently burnt Schlerophyll on south-facing slopes). All observations were recorded by GPS and the species or evidence of species' presence or activity were photographed using a digital camera (Canon PowerShot SX430 IS, Canon Inc, USA). A species list for all fauna recorded within the study area is given in Appendix C.

Given relatively optimal weather conditions, faunal activity was observed to be high over the surveying period, thereby resulting in 31 recorded observations across the study area (Figure 12, Appendix C) relating to one observation per every 0.2 hectares of study area (the study area is 6.1 hectares in extent). During surveying, faunal habitats were broadly identified in the field, and thereafter delineated through a desktop assessment of the study area landscape using satellite imagery (CapeFarmMapper Version 3, Western Cape Department of Agriculture).

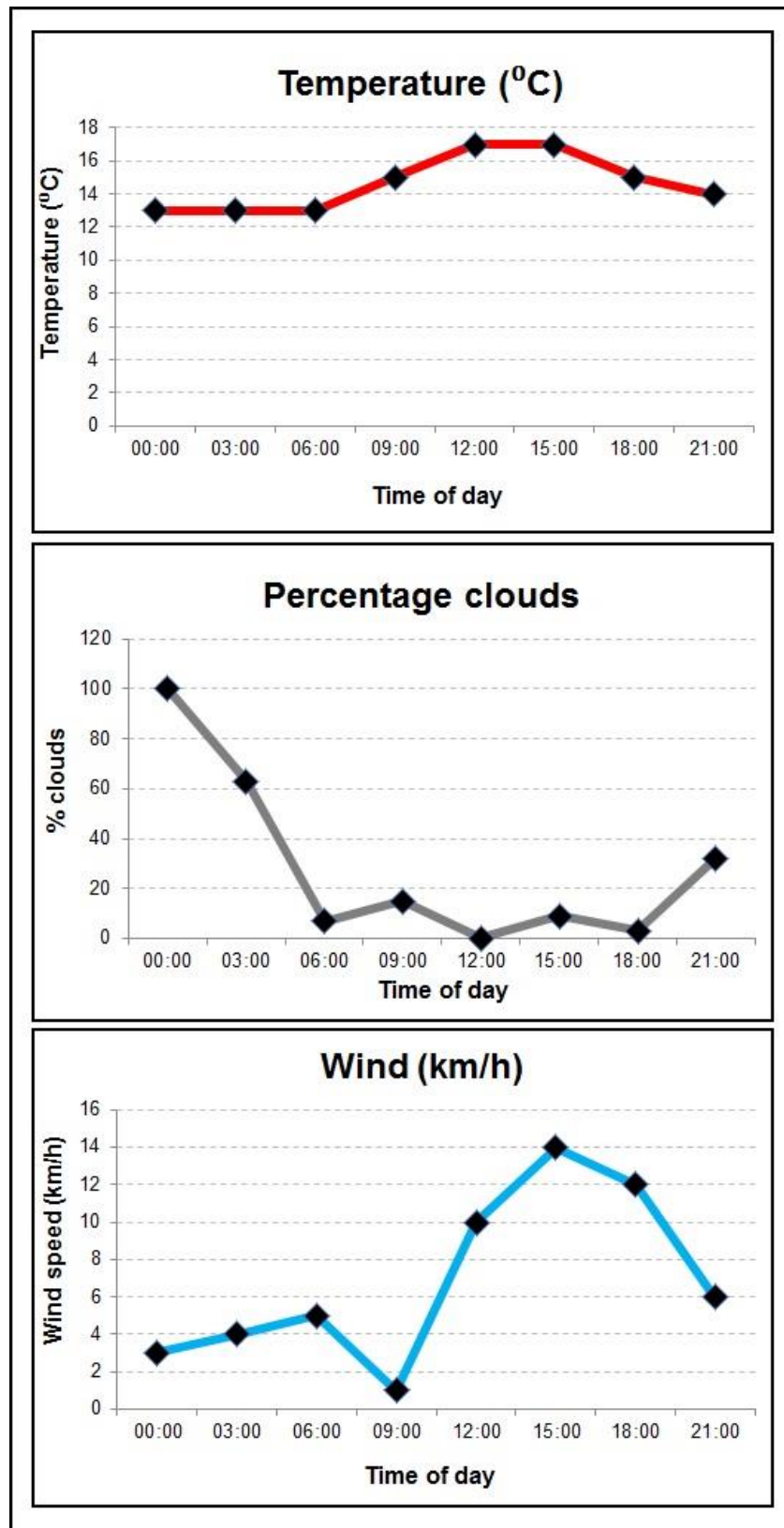


Figure 10 Weather conditions in the study area over the surveying period (08 September 2023). The time of day is indicated, along with the temperature (in °C), percentage cloud cover and wind speed (in km/h) (weather data sourced from <https://www.worldweatheronline.com>).



Figure 11 Spatial tracks recorded by GPS for all the search meanders across the study area over the surveying period.

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Figure 12 Spatial locations of all the faunal observations across the study area over the surveying period.

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6. Assumptions and limitations

Optimal weather conditions during the surveying period along with an open and degraded habitat structure on the site were relatively ideal for detecting a representative sample of the terrestrial faunal and avifaunal species diversity. Even so, it is possible that not all species could be observed (especially cryptic fossorial species), and it is further possible that the surveying period did not correspond to the activity period or activity season of some species.

Although it is therefore possible that the observed faunal composition of the study area only partly reflects the species richness of, and faunal abundances within the study area (Appendix C), the inclusion and consideration of SCC was further based on a thorough desktop assessment for the included faunal groups (mammals and avifauna; Appendices A and B), meaning that all possibly occurring SCC were considered in the current assessment (Section 9).

7. Faunal habitat types within the study area

The study area is comprised of a single habitat type (Figure 14) which consists of pioneer shrub vegetation on an area which appears to have been previously used as a stockpile for dry waste from the Hartenbos WTTWW. To this end, almost no natural habitats remain on the site, and the site appears to harbour a highly degraded habitat structure with significant signs of pollution (Table 2).





Figure 13 A broad indication of the spatial extent of habitat types in the study area landscape. Photo localities (A and B) correspond to the habitat photos in Table 2.

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Table 2 Habitat locations, habitat descriptions and visual representations of the different habitat types within the study area. Location designations (A and B) correspond to the photo locations in Figure 13.

Location	Habitat description	Photo 1	Photo 2
A -34.10558; 22.1015	Shrubland habitat	A1	A2
B -34.10653; 22.10092	<p>This habitat consists of pioneer shrub vegetation (A1-A3) on an area which appears to have been previously used as a stockpile for dry waste from the Hartenbos WTTWW. To this end, almost no natural habitats remain on the site, and the site appears to harbour a highly degraded habitat structure with significant signs of pollution (A3 and B).</p>		



8. Faunal and avifaunal composition within the study area

8.1 Mammals

8.1.1 Desktop assessment

The distributions of 64 mammal species overlap with the study area landscape (Appendix A). Among these, 57 species are currently listed as “Least Concern” by the IUCN (IUCN, 2021), with the remaining seven species representing mammal SCC. These mammal SCC include the following:

1. The Duthie's Golden Mole (*Chlorotalpa duthieae*) classified as “Vulnerable”,
2. Fynbos Golden Mole (*Amblysomus corriae*) classified as “Near-Threatened”,
3. Leopard (*Panthera pardus*) classified as “Vulnerable”,
4. African Clawless Otter (*Aonyx capensis*) classified as “Near-Threatened”,
5. Grey Rhebok (*Pelea capreolus*) classified as “Near-Threatened”,
6. Long-tailed Forest Shrew (*Myosorex longicaudatus*) classified as “Endangered”, and
7. White-tailed Rat (*Mystromys albicaudatus*) classified as “Vulnerable” by the IUCN.

From the observational records available on the MammalMAP (<https://vmus.adu.org.za/>) and iNaturalist (www.iNaturalist.org) platforms (QDGS: 3322BD), 14 mammal species have been confirmed in the study area landscape (Appendix A) of which 13 are currently listed as “Least Concern” and one species, the African Clawless Otter (*Aonyx capensis*) classified as “Near-Threatened” constituting a mammal SCC.

8.1.2 Field survey

Evidence of only two mammal species was recovered within the study area (Figures 14 and 15), both of which are currently classified as “Least concern” by the IUCN (Appendix C). Mammal diversity appears highly impaired on the site, with evidence

of one Common Duiker (*Sylvicapra grimmia*) being previously present on the site, and with only two instances of the presence of the African Mole-rat (*Cryptomys hottentotus*) noted.



Figure 14 Spatial locations of the different mammal species recorded within the study area.

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13 Dennelaan, Stilbaai, 6674



Figure 15 Photographic evidence of the different mammal species recorded in the study area. A) Scat of the Common Duiker (*Sylvicapra grimmia*). B) Mounds of the African Mole-rat (*Cryptomys hottentotus*).

8.2 Avifauna

8.2.1 Desktop assessment

According to the SABAP2 records, 254 bird species have been recorded from the pentad overlapping the study area with 237 species classified as “Least Concern” by the IUCN, and 17 species which constitute avifaunal SCC (Appendix B). These avifaunal SCC include the:

1. Forest Buzzard (*Buteo trizonatus*) classified as “Near-Threatened”,
2. Black Harrier (*Circus maurus*) classified as “Endangered”,
3. African Marsh Harrier (*Circus ranivorus*) classified as “Least Concern”,
4. Martial Eagle (*Polemaetus bellicosus*) classified as “Endangered”,
5. Maccoa Duck (*Oxyura maccoa*) classified as “Endangered”,
6. Red Knot (*Calidris canutus*) classified as “Near-Threatened”,
7. Curlew Sandpiper (*Calidris ferruginea*) classified as “Near-Threatened”,
8. Bar-tailed Godwit (*Limosa lapponica*) classified as “Near-Threatened”,
9. Eurasian Curlew (*Numenius arquata*) classified as “Near-Threatened”,

10. Blue Crane (*Anthropoides paradiseus*) classified as “Vulnerable”,
11. Denham's Bustard (*Neotis denhami*) classified as “Near-Threatened”,
12. Knysna Warbler (*Bradypterus sylvaticus*) classified as “Vulnerable”,
13. Lesser Flamingo (*Phoeniconaias minor*) classified as “Near-Threatened”,
14. Sooty Shearwater (*Ardenna grisea*) classified as “Near-Threatened”,
15. African Penguin (*Spheniscus demersus*) classified as “Endangered”,
16. Cape Cormorant (*Phalacrocorax capensis*) classified as “Endangered”, and
17. Cape Gannet (*Morus capensis*) classified as “Endangered” by the IUCN.

8.2.2 Field survey

In total, only 25 bird species were recorded within the study area, all of which are currently classified as “Least concern” by the IUCN (Figures 16 and 17, Appendix C). While avifauna is the most prominent faunal feature on the site, all birds occurs in low number and constitute only common vegetation associated or terrestrial species.

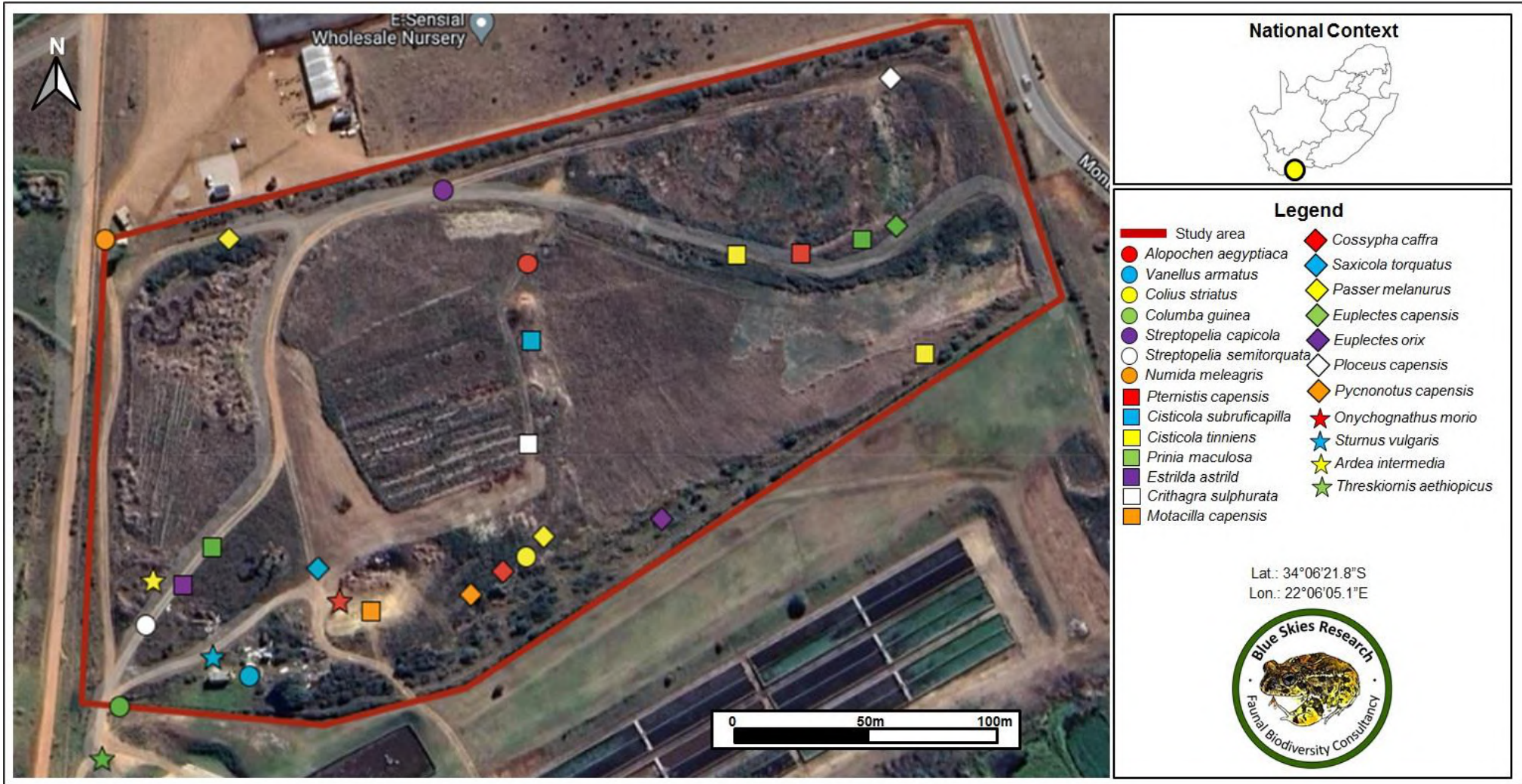


Figure 16 Spatial locations of the different avifaunal species recorded within the study area.

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13 Dennelaan, Stilbaai, 6674





Figure 17 Photographic evidence of different avifaunal species recorded in the study area. A) Egyptian Goose (*Alopochen aegyptiaca*). B) Blacksmith Lapwing (*Vanellus armatus*). C) Speckled Mousebird (*Colius striatus*). D) Speckled Pigeon (*Columba guinea*). E) Cape Turtle Dove (*Streptopelia capicola*). F) Red-eyed Dove (*Streptopelia semitorquata*). G) Helmeted Guineafowl (*Numida meleagris*). H) Grey-backed Cisticola (*Cisticola subruficapilla*). I)

Levaillant's Cisticola (*Cisticola tinniens*). J) Karoo Prinia (*Prinia maculosa*). K) Common Waxbill (*Estrilda astrild*). L) Brimstone Canary (*Crithagra sulphurata*).

M) Cape Wagtail (*Motacilla capensis*). N) Cape Robin-Chat (*Cossypha caffra*). O) African Stonechat (*Saxicola torquatus*). P) Cape Sparrow (*Passer melanurus*). Q) Yellow Bishop (*Euplectes capensis*). R) Southern Red Bishop (*Euplectes orix*). S) Cape Weaver (*Ploceus capensis*). T) Cape Bulbul (*Pycnonotus capensis*). U) Red-winged Starling (*Onychognathus morio*). V) Common Starling (*Sturnus vulgaris*). W) Intermediate Egret (*Ardea intermedia*). X) African Sacred Ibis (*Threskiornis aethiopicus*).

8.3 Grasshoppers

The presence of the Yellow-winged Agile Grasshopper was evaluated based on suitable habitat (recently burnt Schlerophyll on south-facing slopes) for this species - habitat which is not present in the study area landscape. To this end, suitable habitat for the Yellow-winged Agile Grasshopper is absent from the site, and it is highly unlikely that this species will occur here.

8.4 Faunal and avifaunal diversity within the study area

Because the single habitat in the study area exists in a highly degraded and transformed state (Section 7), faunal and avifaunal diversity appears low and is only comprised of only relatively common species of “Least Concern” (IUCN, 2021). Overall, the site supports no notable predator-prey dynamics and is indicative of highly altered and compromised ecosystem dynamics. The site is further adjoined by a nursery to the north, the Hartenbos WWTW to the south and the Monte Christo Road to the east from where daily noise and vibration from vehicles and foot traffic is evident. Furthermore, open farmland is also present to the east of the study area. Notwithstanding its isolated nature in the landscape, the site is fenced over its entirety, thereby precluding terrestrial faunal movement into the site. Given the degraded nature of the study area along with an almost complete lack of connectivity to surrounding natural areas therefore, the site does not represent a functional or important ecological link within the study area landscape.

9. Species of Conservation Concern

Along with the five (two mammal, two avifaunal and one invertebrate) SCC listed in the DFFE Screening Tool (Table 1), the potential occurrence of 22 other (six mammal and 16 avifaunal) SCC within the study area was assessed (Table 3), given their recovery in the desktop assessment (see Section 8). Because the site appears to have been a stockpile for dry wastes from the Hartenbos WWTW it exists in a highly degraded and modified state with no natural habitats remaining. To this end, the study area does not support suitable habitats for any of the SCC considered, and it is highly unlikely that any of these species will occur here. To this end, the entire site may be considered as of a “Very low” sensitivity from a terrestrial faunal and avifaunal perspective.

Table 3 Probability of occurrence of specific SCC in the study area. For each species, the taxonomic Family, scientific name and common name is shown, along with its current classification under the IUCN Red List of Threatened Species (IUCN, 2021). In addition, the probability that the species occurs within the study area is given, along with a justification for listing this probability.

Order	Family	Species	Common name	IUCN status	Probability of occurrence in the study area	Justification of probability
Sensitive Species 5	Sensitive Species 5	<i>Sensitive Species 5</i>	<i>Sensitive Species 5</i>	-	Low	This species does not naturally occur in the Western Cape and it is certain that it will not be present on the site.
Sensitive Species 8	Sensitive Species 8	<i>Sensitive Species 8</i>	<i>Sensitive Species 8</i>	-	Low	No suitable thicket habitat is available for this species on the site and it is certain that it will not be present within the study area.
Afrosoricida	Chrysochloridae	<i>Chlorotalpa duthieae</i>	Duthie's Golden Mole	Vulnerable	Low	No suitable loamy soils or forested / lawn habitat for this species is available on the site. Furthermore, the site appears to have been a stockpile for dry waste from the Hartenbos WWTW, and exists in a degraded and modified state. It is therefore highly unlikely that this species will occur here.
Afrosoricida	Chrysochloridae	<i>Amblysomus corriae</i>	Fynbos Golden Mole	Near-Threatened	Low	No suitable sandy soils are available for this species on the site. Furthermore, the site appears to have been a stockpile for dry waste from the Hartenbos WWTW, and exists in a degraded and modified state. It is therefore highly unlikely that this species will occur here.
Carnivora	Felidae	<i>Panthera pardus</i>	Leopard	Vulnerable	Low	Although this species has a wide habitat tolerance, the site is enclosed from the surrounding landscape by fencing, and does not have an ungulate prey base. Furthermore, the site appears to have been a stockpile for dry waste from the Hartenbos WWTW, and exists in a degraded and modified state. It is therefore highly unlikely that this species will occur here.
Carnivora	Mustelidae	<i>Aonyx capensis</i>	African Clawless Otter	Near-Threatened	Low	No aquatic or wetland habitats are available for this species on the site. Furthermore, the site appears to have been a stockpile for dry waste from the Hartenbos WWTW, and exists in a degraded and modified state. It is therefore highly unlikely that this species will occur here.
Eulipotyphla	Soricidae	<i>Myosorex longicaudatus</i>	Long-tailed Forest Shrew	Endangered	Low	The site does not support the forest, fynbos and moist habitat in pristine condition required by this species. Furthermore, the site appears to have been a stockpile for dry waste from the Hartenbos WWTW, and exists in a degraded and modified state. It is therefore highly unlikely that this species will occur here.
Rodentia	Nesomyidae	<i>Mystromys albicaudatus</i>	White-tailed Rat	Vulnerable	Low	The site does not contain suitable calcrete soils or sloped clay soils in Dune Thicket required by this species. Furthermore, the site appears to have been a stockpile for dry waste from the Hartenbos WWTW, and exists in a degraded and modified state. It is therefore highly unlikely that this species will occur here.

Accipitriformes	Accipitridae	<i>Buteo trizonatus</i>	Forest Buzzard	Near-Threatened	Low	The site does not harbour the forested habitat required by this species. Furthermore, the site appears to have been a stockpile for dry waste from the Hartenbos WWTW, and exists in a degraded and modified state. It is therefore highly unlikely that this species will occur here.
Accipitriformes	Accipitridae	<i>Circus maurus</i>	Black Harrier	Endangered	Low	The site does not harbour the coastal and montane Fynbos, highland grasslands or Karoo subdesert scrub required by this species, and is further devoid of a suitable rodent prey base. Furthermore, the site appears to have been a stockpile for dry waste from the Hartenbos WWTW, and exists in a degraded and modified state. It is therefore highly unlikely that this species will occur here.
Accipitriformes	Accipitridae	<i>Circus ranivorus</i>	African Marsh Harrier	Least Concern	Low	No suitable marsh or wetland habitats required by this species exist on the site, with the site further lacking a suitable rodent prey base. Furthermore, the site appears to have been a stockpile for dry waste from the Hartenbos WWTW, and exists in a degraded and modified state. It is therefore highly unlikely that this species will occur here.
Accipitriformes	Accipitridae	<i>Polemaetus bellicosus</i>	Martial Eagle	Endangered	Low	No suitable open woodland, wooded savanna, bushy grassland or thornbush habitat required by this species exists on the site. Furthermore, the site appears to have been a stockpile for dry waste from the Hartenbos WWTW, and exists in a degraded and modified state. It is therefore highly unlikely that this species will occur here.
Anseriformes	Anatidae	<i>Oxyura maccoa</i>	Maccoa Duck	Endangered	Low	No suitable open water or wetland habitats required by this species exists on the site. Furthermore, the site appears to have been a stockpile for dry waste from the Hartenbos WWTW, and exists in a degraded and modified state. It is therefore highly unlikely that this species will occur here.
Charadriiformes	Laridae	<i>Hydroprogne caspia</i>	Caspian Tern	Least Concern	Low	The species is marine, estuarine and aquatic in its habitat requirements - habitat which is not present on or near the site. It is therefore highly unlikely that this species will occur here.
Charadriiformes	Scolopacidae	<i>Calidris canutus</i>	Red Knot	Near-Threatened	Low	The species is marine and estuarine in its habitat requirements - habitat which is not present on or near the site. It is therefore highly unlikely that this species will occur here.
Charadriiformes	Scolopacidae	<i>Calidris ferruginea</i>	Curlew Sandpiper	Near-Threatened	Low	The species is marine and estuarine in its habitat requirements - habitat which is not present on or near the site. It is therefore highly unlikely that this species will occur here.
Charadriiformes	Scolopacidae	<i>Limosa lapponica</i>	Bar-tailed Godwit	Near-Threatened	Low	The species is marine and estuarine in its habitat requirements - habitat which is not present on or near the site. It is therefore highly unlikely that this species will occur here.
Charadriiformes	Scolopacidae	<i>Numenius arquata</i>	Eurasian Curlew	Near-Threatened	Low	The species is marine and estuarine in its habitat requirements - habitat which is not present on or near the site. It is therefore highly unlikely that this species will occur here.
Galliformes	Gruidae	<i>Anthropoides paradiseus</i>	Blue Crane	Vulnerable	Low	The species prefers natural grass- and sedge-dominated habitats for breeding and uses lowland agricultural areas, particularly pasture, fallow fields and cereal crop fields as feeding areas. As the site does not harbour any of these habitats, and exists in a degraded and modified state, it is therefore highly unlikely that this species will occur here.

Otidiformes	Otididae	<i>Neotis denhami</i>	Denham's Bustard	Near-Threatened	Low	The site does not harbour the grasslands, grassy <i>Acacia</i> -studded dunes, fairly dense shrubland, light woodland, farmland, crops, dried marsh and arid scrub plains preferred by this species. Furthermore, the site appears to have been a stockpile for dry waste from the Hartenbos WWTW, and exists in a degraded and modified state. It is therefore highly unlikely that this species will occur here.
Passeriformes	Locustellidae	<i>Bradypterus sylvaticus</i>	Knysna Warbler	Vulnerable	Low	The species prefers thick, tangled vegetation along the banks of watercourses, or covering drainage lines in fynbos forest patches, or on the edges of afro-montane forest - habitat which is not present on or near the site. Furthermore, the site appears to have been a stockpile for dry waste from the Hartenbos WWTW, and exists in a degraded and modified state. It is therefore highly unlikely that this species will occur here.
Phoenicopteriformes	Phoenicopteridae	<i>Phoeniconaias minor</i>	Lesser Flamingo	Near-Threatened	Low	The species prefers undisturbed alkaline and saline lakes, salt pans or coastal lagoons - habitat which is present on or near the site. It is therefore highly unlikely that this species will occur here.
Procellariiformes	Procellariidae	<i>Ardenna grisea</i>	Sooty Shearwater	Near-Threatened	Low	The species is strictly marine in its habitat requirements - habitat which is not present on or near the site. It is therefore highly unlikely that this species will occur here.
Sphenisciformes	Spheniscidae	<i>Spheniscus demersus</i>	African Penguin	Endangered	Low	The species is strictly marine in its habitat requirements - habitat which is not present on or near the site. It is therefore highly unlikely that this species will occur here.
Suliformes	Phalacrocoracidae	<i>Phalacrocorax capensis</i>	Cape Cormorant	Endangered	Low	The species is marine and estuarine in its habitat requirements - habitat which is not present on or near the site. It is therefore highly unlikely that this species will occur here.
Suliformes	Sulidae	<i>Morus capensis</i>	Cape Gannet	Endangered	Low	The species is strictly marine in its habitat requirements - habitat which is not present on or near the site. It is therefore highly unlikely that this species will occur here.
Orthoptera	Acrididae	<i>Aneuryphymus montanus</i>	Yellow-winged Agile Grasshopper	Vulnerable	Low	The species is associated partly burnt stands of evergreen Sclerophyll in rocky foothills on south-facing cool slopes - habitat which is not present on the site. Furthermore, the site appears to have been a stockpile for dry waste from the Hartenbos WWTW, and exists in a degraded and modified state. It is therefore highly unlikely that this species will occur here.

10. Evaluation of Site Ecological Importance (SEI)

10.1 Evaluating SEI for habitats in the study area

Evaluation of the Site Ecological Importance (SEI) for the single habitat in the study area was performed following the methods and criteria outlined in the Species Environmental Assessment Guideline (SANBI, 2020). In short, SEI is a function of the Biodiversity Importance (BI) of the receptor (e.g., SCC, the vegetation/faunal community or habitat type present on the site) and its resilience to impacts (Receptor Resilience, RR) as follows: $SEI = BI + RR$. Biodiversity Importance (BI) is in turn a function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor as follows: $BI = CI + FI$.

To calculate the Conservation Importance (CI) and Functional Integrity (FI) of each habitat within the study area, the criteria outlined in Table 4 and Table 5 were respectively used.

According to the Species Environmental Assessment Guideline, Conservation Importance (CI) may be defined as follows:

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.”*

Table 4 Conservation importance (CI) criteria (table adapted from the Species Environmental Assessment Guideline, SANBI, 2020).

Conservation Importance (CI)	Fulfilling Criteria
Very high	Confirmed or highly likely occurrence of CR, EN, VU or Extremely Rare or Critically Rare species that have a global EOO of < 10 km ² .
	Any area of natural habitat of a CR ecosystem type or large area (> 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type. Globally significant populations of congregatory species (> 10% of global population).
High	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining.
	Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type. Presence of Rare species. Globally significant populations of congregatory species (> 1% but < 10% of global population).
Medium	Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals.
	Any area of natural habitat of threatened ecosystem type with status of VU. Presence of range-restricted species. > 50% of receptor contains natural habitat with potential to support SCC.
Low	No confirmed or highly likely populations of SCC.
	No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC.
Very low	No confirmed and highly unlikely populations of SCC.
	No confirmed and highly unlikely populations of range-restricted species. No natural habitat remaining.

According to the guideline, Functional Integrity (FI) is defined as:

Functional integrity (FI): *“The receptors’ current ability to maintain the structure and functions that define it, compared to its known or predicted state under ideal conditions. Simply stated, FI is: ‘A measure of the ecological condition of the impact receptor as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts.’”*

Table 5 Functional integrity (FI) criteria (table adapted from the Species Environmental Assessment Guideline, SANBI, 2020).

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

Based on assessments of CI and FI for habitats within the study area, the Biodiversity Importance (BI) of each habitat was calculated using the matrix in Table 6 (based on the formula: $BI = CI + FI$). As Biodiversity Importance (BI) is a function of Conservation Importance (CI) and the Functional Integrity (FI) of a receptor, BI can be derived from a simple matrix of CI and FI as follows:

Table 6 Matrix for calculating Biodiversity Importance (BI) (table adapted from the Species Environmental Assessment Guideline, SANBI, 2020).

Biodiversity Importance (BI)		Conservation Importance (CI)				
		Very high	High	Medium	Low	Very low
Functional Integrity (FI)	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

Finally, the Receptor Resilience for each habitat was evaluated following the criteria listed in Table 7. According to the Species Assessment Guidelines, Receptor resilience (RR) may be defined as follows:

Receptor resilience (RR): *“The intrinsic capacity of the receptor to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention.”*

Table 7 Receptor Resilience (RR) criteria (table adapted from the Species Environmental Assessment Guideline, SANBI, 2020).

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

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13 Dennelaan, Stilbaai, 6674

Taken together, the Site Ecological Importance (SEI) was calculated for each habitat within the study area using the formula: $SEI = BI + RR$, and following the matrix outlined in Table 8. The interpretation of the development actions allowed for each SEI category are outlined in Table 9.

Table 8 Matrix for calculating Site Ecological Importance (SEI) (table adapted from the Species Environmental Assessment Guideline, SANBI, 2020).

Site Ecological Importance (SEI)		Biodiversity Importance (BI)				
		Very high	High	Medium	Low	Very low
Receptor Resilience (RR)	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

Table 9 Guidelines for interpreting SEI in the context of the proposed development activities (table adapted from the Species Environmental Assessment Guideline, SANBI, 2020).

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

10.2 SEI of the habitat in the study area

The SEI result for the single habitat within the study area is given in Table 10 with the spatial representation for this habitat and its concomitant SEI category portrayed in Figure 18. Because this habitat does not support any populations of faunal or avifaunal SCC, and furthermore exist in a highly degraded and modified state, the entire site is retrieved as having a “Very low” SEI, allowing for development activities of medium to high impact without restoration activities being required (Table 10). To this end, the current development will be able to proceed without considering any mitigation measures from a faunal perspective (also see Section 11).

Table 10 Evaluation of SEI for habitats within the study area landscape. BI = Biodiversity Importance, RR = Receptor Resilience.

Habitat type	Conservation Importance	Functional Integrity	Receptor Resilience	Site Ecological Importance
Shrubland	Very low - No confirmed and a highly unlikely presence of populations of terrestrial faunal and avifaunal SCC.	Very low - No habitat connectivity except for flying species. Several major current negative ecological impacts (a highly degraded habitat structure with no remaining natural vegetation).	Very high - Because this habitat appears to have been a stockpile for dry wastes from the Hartenbos WWTW it and exists in a highly degraded and modified state with no natural habitats remaining, it can only recover to this highly degraded state.	Very low - BI = Very low; RR = Very high



Figure 18 Spatial representation of the SEI for the single habitat within the study area.

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13 Dennelaan, Stilbaai, 6674

11. Current impacts, project-related impacts, mitigation measures and development alternatives

11.1 Current impacts

Current impacts within the study area include the following:

- The site appears to have been a stockpile for dry wastes from the Hartenbos WWTW and exists in a highly degraded and modified state with almost no natural habitats remaining
- Significant signs of pollution are evident on the site.
- The site is adjoined by a nursery to the north, the Hartenbos WWTW to the south and the Monte Christo Road to the east from where daily noise and vibration from vehicles and foot traffic is evident.
- The site is further adjoined by open farmland to the east.
- Notwithstanding its isolated nature in the landscape, the site is fenced over its entirety, thereby precluding terrestrial faunal movement into the site.
- The site exhibits a highly impaired terrestrial faunal diversity, with flying faunal species being the dominant faunal assemblage.

Overall, these impacts appear severe and therefore contribute to the highly altered and compromised ecosystem dynamics on the site, with an almost complete lack of connectivity to surrounding natural areas. To this end, the site does not represent a functional or important ecological link within the study area landscape, and is of a “Very low” faunal sensitivity.

11.2 Anticipated project impacts

Planned development activities for the study area will include:

- Clearing of the vegetation,
- soil preparation, and
- construction of the on-site solar plant and associated infrastructure.

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13 Dennelaan, Stilbaai, 6674

The site exists in a highly degraded state with almost no permanent terrestrial fauna and with the only notable faunal assemblage being highly mobile avifauna which are able to move away from any disturbance on their own accord. To this end, impacts from the proposed development will be negligible from a faunal perspective during the construction and operational phases of the project, and will not impinge on biodiversity patterns and processes in the broader landscape. This leaves the entire site as developable from a faunal perspective (Figure 19), with no mitigation measures or impact management actions being advocated.



Figure 19 “Constraints and Opportunities” map of the study area landscape showing areas which are of a lower sensitivity and are therefore suitable for potential development.

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13 Dennelaan, Stilbaai, 6674

12. Conclusion

12.1 Listed sensitivity in the DFFE Screening Tool Report

Although the site sensitivity for the study area is listed as “High” in the DFFE Screening Tool Report (Figure 1, Section 3), the results from the current report indicate that the site may be considered as of a “Low” to “Very low” sensitivity from a terrestrial faunal and avifaunal perspective. This follows from the highly degraded habitat structure on the site which harbours a highly impaired faunal diversity, and does not constitute suitable habitat for any of the SCC considered.

12.2 Overlap with an Ecological Support Area (ESA)

Currently, the site overlaps with a terrestrial Ecological Support Area (ESA) over its entirety (Subsection 4.5). Following the ground-truthing phase however, it was established that the study area exists in a highly degraded and secondary state, retaining almost none of its original natural character or species composition with highly compromised biodiversity patterns, processes and ecosystem dynamics and with poor connectivity to the surrounding landscape. To this end, the study area fails to meet the criteria of an ESA, which is defined as: “*Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services.*”. As such, no management objectives for the study area are prioritised, allowing for high impact land uses (also see Section 10).

12.3 Conclusion

This report provides a representative faunal and avifaunal assessment of the study area considering facets of:

- Terrestrial faunal and avifaunal habitat composition (Section 7),
- terrestrial faunal and avifaunal components (Section 8),
- the presence of any terrestrial faunal and avifaunal SCC on the site (Section 9),

- the SEI of the single habitat within the study area, with associated acceptable development activities (Section 10), and
- a “Constraints and opportunities” map of the site (Section 11).

Taken together, the results of the report indicate the following:

- The study area is comprised of a single habitat type which consists of pioneer shrub vegetation on an area which appears to have been previously used as a stockpile for dry waste from the Hartenbos WTTWW. To this end, almost no natural habitats remain on the site, and the site appears to harbour a highly degraded habitat structure with significant signs of pollution (Section 7).
- Faunal and avifaunal diversity appears low and is comprised of only relatively common species of “Least Concern”. Overall, the site supports no notable predator-prey dynamics, is indicative of highly altered and compromised ecosystem dynamics and exhibits an almost complete lack of connectivity to surrounding natural areas. To this end, the site does not represent a functional or important ecological link within the study area landscape (Section 8).
- The study area does not support suitable habitats for any of the SCC considered, and it is highly unlikely that any of these species will occur here. To this end, the entire site may be considered as of a “Very low” sensitivity from a terrestrial faunal and avifaunal perspective (Section 9).
- The entire site is retrieved as having a “Very low” SEI, allowing for development activities of medium to high impact without restoration activities being required (Section 10).
- Current impacts within the study area (a highly degraded and modified state with almost no natural habitats remaining, significant signs of pollution, an isolated nature in relation to the surrounding landscape and a highly impaired terrestrial faunal diversity) appear severe and therefore contribute to the highly altered and compromised ecosystem dynamics on the site (Section 11).
- Impacts from the proposed development will be negligible from a faunal perspective during the construction and operational phases of the project, and will not impinge on biodiversity patterns and processes in the broader

landscape. This leaves the entire site as developable from a faunal perspective, with no mitigation measures or impact management actions being advocated (Section 11).

- The study area landscape may be considered as of a “Low” to “Very low” sensitivity” from a terrestrial faunal and avifaunal perspective, given a highly degraded habitat structure which harbours a highly impaired faunal diversity, and does not constitute suitable habitat for any of the SCC considered (Subsection 12.1).
- The study area exists in a highly degraded and secondary state, retaining almost none of its original natural character or species composition with highly compromised biodiversity patterns, processes and ecosystem dynamics and with poor connectivity to the surrounding landscape. To this end, the study area fails to meet the criteria of an ESA, and no management objectives for the study area are prioritised, allowing for high impact land uses (Subsection 12.2).

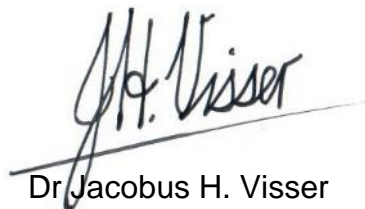
Taken together therefore, there is no reason why the proposed development should not proceed, and the development is supported from a faunal biodiversity perspective.

13. Conditions to which this statement is subjected

The content of this report is based on the author’s best scientific and professional knowledge as well as available information. Since environmental impact studies deal with dynamic natural systems, additional information may come to light at a later stage which is not listed in this report. As such, the conclusions and recommendations made in this report are done in good faith based on information gathered at the time of the investigation.

This report must not be altered or added to without the prior written consent of the author. This also refers to electronic copies of the report, which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report

must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

A handwritten signature in black ink, appearing to read 'J.H. Visser', is written over a horizontal line.

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(PhD Zoology; Pr. Sci. Nat.)

SACNASP Registration Number: 128018

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Appendix A

Appendix A Desktop species list of the mammal species which have a distribution overlapping with the study area (constructed with reference to Skinner and Chimimba, 2005). Species in bold have been previously recorded within the study area landscape (QDGS: 3422AA, MammalMAP, <https://vmus.adu.org.za/>; iNaturalist, www.iNaturalist.org). For each species, the taxonomic Order, Family, species binomial name and common name is shown, along with the current IUCN Red List classification of the species.

Mammals Desktop Species List				
Order	Family	Species	Common name	Status
Afrosoricida	Chrysochloridae	<i>Chlorotalpa duthieae</i>	Duthie's Golden Mole	Vulnerable
		<i>Amblysomus corriae</i>	Fynbos Golden Mole	Near-Threatened
		<i>Amblysomus hottentotus</i>	Hottentot Golden Mole	Least Concern
Carnivora	Canidae	<i>Canis mesomelas</i>	Black-backed Jackal	Least Concern
		<i>Vulpes chama</i>	Cape Fox	Least Concern
	Felidae	<i>Caracal caracal</i>	Caracal	Least Concern
		<i>Felis silvestris</i>	African Wild Cat	Least Concern
		<i>Leptailurus serval</i>	Serval	Least Concern
		<i>Panthera pardus</i>	Leopard	Vulnerable
		<i>Proteles cristata</i>	Aardwolf	Least Concern
	Herpestidae	<i>Atilax paludinosus</i>	Marsh Mongoose	Least Concern
		<i>Cynictis penicillata</i>	Yellow Mongoose	Least Concern
		<i>Herpestes ichneumon</i>	Egyptian Mongoose	Least Concern
		<i>Herpestes pulverulentus</i>	Cape Grey Mongoose	Least Concern
	Mustelidae	<i>Aonyx capensis</i>	African Clawless Otter	Near-Threatened
		<i>Ictonyx striatus</i>	Zorilla	Least Concern
<i>Mellivora capensis</i>		Honey Badger	Least Concern	
<i>Poecilogale albinucha</i>		African Striped Weasel	Least Concern	

CELL: (083) 453 7916 E-MAIL: BlueSkiesResearch01@gmail.com

13 Dennelaan, Stilbaai, 6674

	Viverridae	<i>Genetta genetta</i>	Common Genet	Least Concern
		<i>Genetta tigrina</i>	Cape Genet	Least Concern
Cetartiodactyla	Bovidae	<i>Oreotragus oreotragus</i>	Klipspringer	Least Concern
		<i>Pelea capreolus</i>	Grey Rhebok	Near-Threatened
		<i>Philantomba monticola</i>	Blue Duiker	Least Concern
		<i>Raphicerus campestris</i>	Steenbok	Least Concern
		<i>Raphicerus melanotis</i>	Cape Grysbok	Least Concern
		<i>Sylvicapra grimmia</i>	Common Duiker	Least Concern
		<i>Tragelaphus scriptus</i>	Southern Bushbuck	Least Concern
	Suidae	<i>Potamochoerus larvatus</i>	Bushpig	Least Concern
Chiroptera	Molossidae	<i>Tadarida aegyptiaca</i>	Egyptian Free-tailed Bat	Least Concern
	Nycteridae	<i>Nycteris thebaica</i>	Cape Long-eared Bat	Least Concern
	Pteropodidae	<i>Epomophorus wahlbergi</i>	Wahlberg's Epauletted Fruit Bat	Least Concern
		<i>Rousettus aegyptiacus</i>	Egyptian Fruit Bat	Least Concern
	Rhinolophidae	<i>Rhinolophus capensis</i>	Cape Horseshoe Bat	Least Concern
		<i>Rhinolophus clivus</i>	Geoffroy's Horseshoe Bat	Least Concern
	Vespertilionidae	<i>Myotis tricolor</i>	Temminck's Hairy Bat	Least Concern
		<i>Neoromicia capensis</i>	Cape Bat	Least Concern
Eulipotyphla	Soricidae	<i>Crocidura cyanea</i>	Reddish-grey Musk Shrew	Least Concern
		<i>Crocidura flavescens</i>	Greater Red Musk Shrew	Least Concern
		<i>Myosorex longicaudatus</i>	Long-tailed Forest Shrew	Endangered
		<i>Myosorex varius</i>	Forest Shrew	Least Concern
		<i>Suncus infinitesimus</i>	Least Dwarf Shrew	Least Concern
		<i>Suncus varilla</i>	Lesser Dwarf Shrew	Least Concern
Hyracoidea	Procaviidae	<i>Procavia capensis</i>	Rock Hyrax	Least Concern
Lagomorpha	Leporidae	<i>Lepus saxatilis</i>	Cape Scrub Hare	Least Concern
		<i>Pronolagus saundersiae</i>	Hewitt's Red Rock Hare	Least Concern
Primates	Cercopithecidae	<i>Chlorocebus pygerythrus</i>	Vervet Monkey	Least Concern
		<i>Papio ursinus</i>	Chacma Baboon	Least Concern

CELL: (083) 453 7916 E-MAIL: BlueSkiesResearch01@gmail.com

13 Dennelaan, Stilbaai, 6674

Rodentia	Bathyergidae	<i>Bathyergus suillus</i>	Cape Dune Mole-rat	Least Concern
		<i>Cryptomys hottentotus</i>	African Mole-rat	Least Concern
		<i>Georychus capensis</i>	Cape Mole-rat	Least Concern
	Gliridae	<i>Graphiurus murinus</i>	Woodland Dormouse	Least Concern
	Hystricidae	<i>Hystrix africaeaustralis</i>	Cape Porcupine	Least Concern
	Muridae	<i>Acomys subspinosus</i>	Cape Spiny Mouse	Least Concern
		<i>Gerbillurus paeba</i>	Hairy-footed Gerbil	Least Concern
		<i>Micaelamys namaquensis</i>	Namaqua Rock Rat	Least Concern
		<i>Mus minutoides</i>	Pygmy Mouse	Least Concern
		<i>Myomyscus verreauxii</i>	Verreaux's Mouse	Least Concern
		<i>Otomys irroratus</i>	Southern African Vlei Rat	Least Concern
		<i>Rhabdomys pumilio</i>	Four-striped Grass Mouse	Least Concern
	Nesomyidae	<i>Dendromus melanotis</i>	Grey Climbing Mouse	Least Concern
		<i>Dendromus mesomelas</i>	Brant's Climbing Mouse	Least Concern
		<i>Mystromys albicaudatus</i>	White-tailed Rat	Vulnerable
		<i>Saccostomus campestris</i>	Pouched Mouse	Least Concern
		<i>Steatomys krebsii</i>	Krebs' Fat Mouse	Least Concern

Appendix B

Appendix B Desktop species list of the avifaunal species which have been recorded in the pentad (3405_2205) which overlaps the study area (the South African Bird Atlas Project 2, <https://sabap2.birdmap.africa/>). For each species, the taxonomic Order, Family, species binomial name and common name is shown, along with the current IUCN Red List classification of the species. In addition, the total number of observations for each species is shown, along with the latest date the species was recorded within the pentad. Species in bold represent avifaunal species of conservation concern (SCC).

Avifauna Desktop Species List								
Order	Family	Species	Common name	IUCN status	Number of observations	Latest record		
Accipitriformes	Accipitridae	<i>Accipiter melanoleucus</i>	Black Sparrowhawk	Least Concern	6	2023/07/27		
		<i>Accipiter rufiventris</i>	Rufous-breasted Sparrowhawk	Least Concern	2	2020/03/27		
		<i>Accipiter tachiro</i>	African Goshawk	Least Concern	4	2022/12/17		
		<i>Buteo buteo</i>	Common Buzzard	Least Concern	31	2023/02/06		
		<i>Buteo rufofuscus</i>	Jackal Buzzard	Least Concern	129	2023/07/12		
		<i>Buteo trizonatus</i>	Forest Buzzard	Near-Threatened	1	2017/04/08		
		<i>Circus maurus</i>	Black Harrier	Endangered	7	2022/12/25		
		<i>Circus ranivorus</i>	African Marsh Harrier	Least Concern	33	2023/06/03		
		<i>Elanus caeruleus</i>	Black-winged Kite	Least Concern	181	2023/07/08		
		<i>Haliaeetus vocifer</i>	African Fish Eagle	Least Concern	59	2023/06/07		
		<i>Hieraaetus pennatus</i>	Booted Eagle	Least Concern	21	2022/11/09		
		<i>Milvus aegyptius</i>	Yellow-billed Kite	Least Concern	12	2023/02/06		
		<i>Polemaetus bellicosus</i>	Martial Eagle	Endangered	8	2021/01/23		
		<i>Polyboroides typus</i>	African Harrier-Hawk	Least Concern	6	2023/05/22		
			Pandionidae	<i>Pandion haliaetus</i>	Western Osprey	Least Concern	20	2023/04/26
		Anseriformes	Anatidae	<i>Alopochen aegyptiaca</i>	Egyptian Goose	Least Concern	286	2023/07/27

CELL: (083) 453 7916 E-MAIL: BlueSkiesResearch01@gmail.com

13 Dennelaan, Stilbaai, 6674

		<i>Anas capensis</i>	Cape Teal	Least Concern	268	2023/07/27
		<i>Anas erythrorhyncha</i>	Red-billed Teal	Least Concern	189	2023/07/12
		<i>Anas platyrhynchos</i>	Mallard	Least Concern	166	2023/07/27
		<i>Anas platyrhynchos</i>	Domestic Duck	Least Concern	1	2018/08/04
		<i>Anas sparsa</i>	African Black Duck	Least Concern	3	2022/12/15
		<i>Anas undulata</i>	Yellow-billed Duck	Least Concern	293	2023/07/27
		<i>Anser anser</i>	Greylag Goose	Least Concern	1	2016/11/03
		<i>Dendrocygna viduata</i>	White-faced Whistling Duck	Least Concern	43	2023/07/02
		<i>Netta erythrophthalma</i>	Southern Pochard	Least Concern	32	2022/11/09
		<i>Oxyura maccoa</i>	Maccoa Duck	Endangered	3	2022/12/16
		<i>Plectropterus gambensis</i>	Spur-winged Goose	Least Concern	34	2023/06/03
		<i>Spatula hottentota</i>	Blue-billed Teal	Least Concern	11	2023/06/15
		<i>Spatula smithii</i>	Cape Shoveler	Least Concern	264	2023/07/12
		<i>Tadorna cana</i>	South African Shelduck	Least Concern	20	2023/04/26
		<i>Thalassornis leuconotus</i>	White-backed Duck	Least Concern	4	2022/07/27
Bucerotiformes	Upupidae	<i>Upupa africana</i>	African Hoopoe	Least Concern	95	2023/07/02
Caprimulgiformes	Apodidae	<i>Apus affinis</i>	Little Swift	Least Concern	161	2023/06/21
		<i>Apus apus</i>	Common Swift	Least Concern	5	2023/03/11
		<i>Apus barbatus</i>	African Black Swift	Least Concern	46	2023/06/23
		<i>Apus caffer</i>	White-rumped Swift	Least Concern	175	2023/03/29
		<i>Apus horus</i>	Horus Swift	Least Concern	4	2022/03/09
		<i>Cypsiurus parvus</i>	African Palm Swift	Least Concern	101	2023/06/23
		<i>Tachymarpis melba</i>	Alpine Swift	Least Concern	11	2022/12/16
	Caprimulgidae	<i>Caprimulgus pectoralis</i>	Fiery-necked Nightjar	Least Concern	22	2022/09/30
Charadriiformes	Burhinidae	<i>Burhinus capensis</i>	Spotted Thick-knee	Least Concern	105	2023/07/08
		<i>Burhinus vermiculatus</i>	Water Thick-knee	Least Concern	230	2023/07/27
		<i>Charadrius hiaticula</i>	Common Ringed Plover	Least Concern	107	2023/02/06
		<i>Charadrius leschenaultii</i>	Greater Sand Plover	Least Concern	1	2019/12/26
		<i>Charadrius marginatus</i>	White-fronted Plover	Least Concern	201	2023/07/27

CELL: (083) 453 7916 E-MAIL: BlueSkiesResearch01@gmail.com

13 Dennelaan, Stilbaai, 6674

	<i>Charadrius pecuarius</i>	Kittlitz's Plover	Least Concern	72	2023/06/21
	<i>Charadrius tricollaris</i>	Three-banded Plover	Least Concern	197	2023/07/27
	<i>Pluvialis squatarola</i>	Grey Plover	Least Concern	39	2022/12/17
	<i>Vanellus armatus</i>	Blacksmith Lapwing	Least Concern	336	2023/07/27
	<i>Vanellus coronatus</i>	Crowned Lapwing	Least Concern	108	2023/07/27
Charadriidae	<i>Charadrius pallidus</i>	Chestnut-banded Plover	Least Concern	2	2018/08/23
	<i>Charadrius mongolus</i>	Lesser Sandplover	Least Concern	7	2023/02/03
	<i>Vanellus melanopterus</i>	Black-winged Lapwing	Least Concern	1	2018/03/17
Chionidae	<i>Chionis albus</i>	Snowy Sheathbill	Least Concern	6	2017/06/18
Haematopodidae	<i>Haematopus moquini</i>	African Oystercatcher	Least Concern	326	2023/07/27
Jacanidae	<i>Actophilornis africanus</i>	African Jacana	Least Concern	10	2021/10/24
Laridae	<i>Chlidonias hybrida</i>	Whiskered Tern	Least Concern	14	2020/10/12
	<i>Chlidonias leucopterus</i>	White-winged Tern	Least Concern	3	2023/03/11
	<i>Hydroprogne caspia</i>	Caspian Tern	Least Concern	171	2023/07/02
	<i>Larus cirrocephalus</i>	Grey-headed Gull	Least Concern	363	2023/07/27
	<i>Larus dominicanus</i>	Kelp Gull	Least Concern	387	2023/07/30
	<i>Larus hartlaubii</i>	Hartlaub's Gull	Least Concern	129	2023/06/07
	<i>Leucophaeus pipixcan</i>	Franklin's Gull	Least Concern	4	2017/04/08
	<i>Sterna hirundo</i>	Common Tern	Least Concern	163	2023/06/21
	<i>Sterna dougallii</i>	Roseate Tern	Least Concern	13	2023/06/21
	<i>Sterna paradisaea</i>	Arctic Tern	Least Concern	4	2020/11/19
	<i>Sternula albifrons</i>	Little Tern	Least Concern	8	2019/12/31
	<i>Thalasseus bergii</i>	Greater Crested Tern	Least Concern	267	2023/07/27
	<i>Thalasseus sandvicensis</i>	Sandwich Tern	Least Concern	154	2023/06/03
Recurvirostridae	<i>Himantopus himantopus</i>	Black-winged Stilt	Least Concern	290	2023/07/27
	<i>Recurvirostra avosetta</i>	Pied Avocet	Least Concern	95	2023/07/27
Scolopacidae	<i>Actitis hypoleucos</i>	Common Sandpiper	Least Concern	71	2023/03/16
	<i>Arenaria interpres</i>	Ruddy Turnstone	Least Concern	20	2022/09/30
	<i>Calidris alba</i>	Sanderling	Least Concern	46	2023/04/26

CELL: (083) 453 7916 E-MAIL: BlueSkiesResearch01@gmail.com

13 Dennelaan, Stilbaai, 6674

		<i>Calidris canutus</i>	Red Knot	Near-Threatened	5	2022/12/17
		<i>Calidris ferruginea</i>	Curlew Sandpiper	Near-Threatened	9	2023/06/15
		<i>Calidris melanotos</i>	Pectoral Sandpiper	Least Concern	7	2017/01/12
		<i>Calidris minuta</i>	Little Stint	Least Concern	44	2022/12/25
		<i>Calidris pugnax</i>	Ruff	Least Concern	45	2023/03/11
		<i>Gallinago nigripennis</i>	African Snipe	Least Concern	42	2023/07/02
		<i>Limosa lapponica</i>	Bar-tailed Godwit	Near-Threatened	33	2023/07/12
		<i>Numenius arquata</i>	Eurasian Curlew	Near-Threatened	4	2021/01/16
		<i>Numenius phaeopus</i>	Eurasian Whimbrel	Least Concern	177	2023/07/12
		<i>Tringa glareola</i>	Wood Sandpiper	Least Concern	88	2023/02/12
		<i>Tringa nebularia</i>	Common Greenshank	Least Concern	185	2023/07/12
		<i>Tringa stagnatilis</i>	Marsh Sandpiper	Least Concern	20	2022/12/16
		<i>Xenus cinereus</i>	Terek Sandpiper	Least Concern	10	2020/11/19
	Stercorariidae	<i>Catharacta antarctica</i>	Brown Skua	Least Concern	2	2017/06/18
		<i>Ciconia ciconia</i>	White Stork	Least Concern	6	2022/02/04
		<i>Stercorarius parasiticus</i>	Arctic Jaeger	Least Concern	1	2021/10/10
	Turnicidae	<i>Turnix hottentottus</i>	Fynbos Buttonquail	Least Concern	1	2023/04/16
Coliiformes	Coliidae	<i>Colius colius</i>	White-backed Mousebird	Least Concern	7	2020/11/19
		<i>Colius striatus</i>	Speckled Mousebird	Least Concern	271	2023/07/27
		<i>Urocolius indicus</i>	Red-faced Mousebird	Least Concern	194	2023/08/09
Columbiformes	Columbidae	<i>Columba arquatrix</i>	African Olive Pigeon	Least Concern	2	2021/11/27
		<i>Columba guinea</i>	Speckled Pigeon	Least Concern	368	2023/07/27
		<i>Columba livia</i>	Rock Dove	Least Concern	117	2023/07/12
		<i>Oena capensis</i>	Namaqua Dove	Least Concern	8	2023/07/02
		<i>Spilopelia senegalensis</i>	Laughing Dove	Least Concern	371	2023/07/30
		<i>Streptopelia capicola</i>	Cape Turtle Dove	Least Concern	211	2023/07/12
		<i>Streptopelia semitorquata</i>	Red-eyed Dove	Least Concern	324	2023/07/27
		<i>Turtur tympanistria</i>	Tambourine Dove	Least Concern	7	2023/02/01
Coraciiformes	Alcedinidae	<i>Ceryle rudis</i>	Pied Kingfisher	Least Concern	287	2023/07/27

CELL: (083) 453 7916 E-MAIL: BlueSkiesResearch01@gmail.com

13 Dennelaan, Stilbaai, 6674

		<i>Corythornis cristatus</i>	Malachite Kingfisher	Least Concern	24	2023/06/07
		<i>Halcyon albiventris</i>	Brown-hooded Kingfisher	Least Concern	27	2023/03/29
		<i>Megaceryle maxima</i>	Giant Kingfisher	Least Concern	66	2023/07/27
Cuculiformes	Cuculidae	<i>Centropus burchellii</i>	Burchell's Coucal	Least Concern	62	2023/07/02
		<i>Chrysococcyx caprius</i>	Diederik Cuckoo	Least Concern	77	2023/02/03
		<i>Chrysococcyx klaas</i>	Klaas's Cuckoo	Least Concern	27	2023/07/27
		<i>Clamator jacobinus</i>	Jacobin Cuckoo	Least Concern	10	2022/10/19
		<i>Cuculus solitarius</i>	Red-chested Cuckoo	Least Concern	8	2022/12/07
Falconiformes	Falconidae	<i>Falco biarmicus</i>	Lanner Falcon	Least Concern	6	2022/12/15
		<i>Falco peregrinus</i>	Peregrine Falcon	Least Concern	58	2023/06/03
		<i>Falco rupicolus</i>	Rock Kestrel	Least Concern	117	2023/07/02
Galliformes	Gruidae	<i>Anthropoides paradiseus</i>	Blue Crane	Vulnerable	10	2022/12/25
	Numididae	<i>Numida meleagris</i>	Helmeted Guineafowl	Least Concern	168	2023/07/08
	Phasianidae	<i>Coturnix coturnix</i>	Common Quail	Least Concern	2	2020/10/26
		<i>Pavo cristatus</i>	Indian Peafowl	Least Concern	15	2023/02/01
		<i>Pternistis capensis</i>	Cape Spurfowl	Least Concern	329	2023/07/27
		<i>Scleroptila afra</i>	Grey-winged Francolin	Least Concern	10	2022/12/25
	Rallidae	<i>Fulica cristata</i>	Red-knobbed Coot	Least Concern	320	2023/07/12
		<i>Gallinula chloropus</i>	Common Moorhen	Least Concern	264	2023/07/12
		<i>Porphyrio madagascariensis</i>	African Swamphen	Least Concern	101	2023/07/12
		<i>Rallus caerulescens</i>	African Rail	Least Concern	2	2020/06/03
		<i>Zapornia flavirostra</i>	Black Crake	Least Concern	84	2023/07/12
Musophagiformes	Musophagidae	<i>Tauraco corythaix</i>	Knysna Turaco	Least Concern	1	2019/07/03
Otidiformes	Otididae	<i>Neotis denhami</i>	Denham's Bustard	Near-Threatened	1	2014/12/07
Passeriformes	Acrocephalidae	<i>Acrocephalus baeticatus</i>	African Reed Warbler	Least Concern	56	2022/12/30
		<i>Acrocephalus gracilirostris</i>	Lesser Swamp Warbler	Least Concern	187	2023/07/27
		<i>Acrocephalus scirpaceus</i>	Common Reed-warbler	Least Concern	1	2023/04/02
	Alaudidae	<i>Calandrella cinerea</i>	Red-capped Lark	Least Concern	5	2022/11/02
		<i>Certhilauda brevirostris</i>	Agulhas Long-billed Lark	Least Concern	5	2022/12/25

CELL: (083) 453 7916 E-MAIL: BlueSkiesResearch01@gmail.com

13 Dennelaan, Stilbaai, 6674

	<i>Galerida magnirostris</i>	Large-billed Lark	Least Concern	4	2022/12/25
	<i>Mirafrapa apiata</i>	Cape Clapper Lark	Least Concern	3	2020/10/06
Campephagidae	<i>Campephaga flava</i>	Black Cuckooshrike	Least Concern	1	2022/05/24
Cisticolidae	<i>Apalis thoracica</i>	Bar-throated Apalis	Least Concern	275	2023/07/27
	<i>Camaroptera brachyura</i>	Bleating Camaroptera	Least Concern	2	2022/12/30
	<i>Cisticola fulvicapilla</i>	Neddicky	Least Concern	114	2023/07/02
	<i>Cisticola juncidis</i>	Zitting Cisticola	Least Concern	47	2023/07/02
	<i>Cisticola subruficapilla</i>	Grey-backed Cisticola	Least Concern	58	2023/07/02
	<i>Cisticola textrix</i>	Cloud Cisticola	Least Concern	1	2012/12/26
	<i>Cisticola tinniens</i>	Levaillant's Cisticola	Least Concern	228	2023/07/12
	<i>Prinia maculosa</i>	Karoo Prinia	Least Concern	317	2023/07/27
Corvidae	<i>Corvus albicollis</i>	White-necked Raven	Least Concern	42	2023/05/01
	<i>Corvus albus</i>	Pied Crow	Least Concern	148	2023/07/02
	<i>Corvus capensis</i>	Cape Crow	Least Concern	34	2023/07/02
Dicruridae	<i>Dicrurus adsimilis</i>	Fork-tailed Drongo	Least Concern	150	2023/07/27
Emberizidae	<i>Emberiza capensis</i>	Cape Bunting	Least Concern	26	2022/09/30
Estrildidae	<i>Coccyzygia melanotis</i>	Swee Waxbill	Least Concern	7	2022/05/10
	<i>Estrilda astrild</i>	Common Waxbill	Least Concern	148	2023/07/02
	<i>Lagonosticta rubricata</i>	African Firefinch	Least Concern	2	2023/03/29
Fringillidae	<i>Crithagra albogularis</i>	White-throated Canary	Least Concern	35	2022/12/16
	<i>Crithagra flaviventris</i>	Yellow Canary	Least Concern	102	2023/07/02
	<i>Crithagra gularis</i>	Streaky-headed Seedeater	Least Concern	121	2023/07/27
	<i>Crithagra scotops</i>	Forest Canary	Least Concern	3	2014/12/07
	<i>Crithagra sulphurata</i>	Brimstone Canary	Least Concern	24	2023/07/02
	<i>Serinus canicollis</i>	Cape Canary	Least Concern	142	2023/08/09
Hirundinidae	<i>Cecropis abyssinica</i>	Lesser Striped Swallow	Least Concern	3	2021/01/16
	<i>Cecropis cucullata</i>	Greater Striped Swallow	Least Concern	190	2023/06/03
	<i>Delichon urbicum</i>	Common House Martin	Least Concern	6	2020/12/12
	<i>Hirundo albigularis</i>	White-throated Swallow	Least Concern	172	2023/04/02

CELL: (083) 453 7916 E-MAIL: BlueSkiesResearch01@gmail.com

13 Dennelaan, Stilbaai, 6674

	<i>Hirundo dimidiata</i>	Pearl-breasted Swallow	Least Concern	46	2023/02/01
	<i>Hirundo rustica</i>	Barn Swallow	Least Concern	124	2023/04/02
	<i>Psalidoprocne pristopectera</i>	Black Saw-wing	Least Concern	42	2023/04/26
	<i>Ptyonoprogne fuligula</i>	Rock Martin	Least Concern	165	2023/07/27
	<i>Riparia cincta</i>	Banded Martin	Least Concern	1	2012/12/26
	<i>Riparia paludicola</i>	Brown-throated Martin	Least Concern	240	2023/07/27
Laniidae	<i>Lanius collaris</i>	Southern Fiscal	Least Concern	309	2023/07/27
Locustellidae	<i>Bradypterus baboecala</i>	Little Rush Warbler	Least Concern	97	2023/07/02
	<i>Bradypterus sylvaticus</i>	Knysna Warbler	Vulnerable	29	2023/07/27
Macrosphenidae	<i>Sphenoeacus afer</i>	Cape Grassbird	Least Concern	44	2023/04/26
	<i>Sylvietta rufescens</i>	Long-billed Crombec	Least Concern	20	2023/07/02
Malaconotidae	<i>Chlorophoneus olivaceus</i>	Olive Bushshrike	Least Concern	30	2023/02/12
	<i>Laniarius ferrugineus</i>	Southern Boubou	Least Concern	147	2023/07/27
	<i>Tchagra tchagra</i>	Southern Tchagra	Least Concern	61	2023/05/30
	<i>Telophorus zeylonus</i>	Bokmakierie	Least Concern	129	2023/06/21
Monarchidae	<i>Terpsiphone viridis</i>	African Paradise Flycatcher	Least Concern	10	2022/12/16
Motacillidae	<i>Anthus cinnamomeus</i>	African Pipit	Least Concern	43	2023/07/27
	<i>Macronyx capensis</i>	Cape Longclaw	Least Concern	21	2022/12/16
	<i>Motacilla aguimp</i>	African Pied Wagtail	Least Concern	3	2020/09/03
	<i>Motacilla capensis</i>	Cape Wagtail	Least Concern	397	2023/07/27
Muscicapidae	<i>Cossypha caffra</i>	Cape Robin-Chat	Least Concern	304	2023/07/27
	<i>Emarginata schlegelii</i>	Karoo Chat	Least Concern	2	2020/09/12
	<i>Melaenornis silens</i>	Fiscal Flycatcher	Least Concern	205	2023/07/12
	<i>Monticola rupestris</i>	Cape Rock Thrush	Least Concern	24	2023/07/02
	<i>Muscicapa adusta</i>	African Dusky Flycatcher	Least Concern	7	2022/02/12
	<i>Oenanthe familiaris</i>	Familiar Chat	Least Concern	113	2023/07/02
	<i>Oenanthe pileata</i>	Capped Wheatear	Least Concern	5	2022/05/01
	<i>Saxicola torquatus</i>	African Stonechat	Least Concern	49	2023/07/02
	<i>Turdus olivaceus</i>	Olive Thrush	Least Concern	38	2023/05/30

CELL: (083) 453 7916 E-MAIL: BlueSkiesResearch01@gmail.com

13 Dennelaan, Stilbaai, 6674

	<i>Tychaedon coryphoeus</i>	Karoo Scrub Robin	Least Concern	67	2023/07/02
Nectariniidae	<i>Anthobaphes violacea</i>	Orange-breasted Sunbird	Least Concern	2	2016/12/12
	<i>Chalcomitra amethystina</i>	Amethyst Sunbird	Least Concern	148	2023/06/21
	<i>Cinnyris afer</i>	Greater Double-collared Sunbird	Least Concern	162	2023/07/27
	<i>Cinnyris chalybeus</i>	Southern Double-collared Sunbird	Least Concern	152	2023/07/02
	<i>Nectarinia famosa</i>	Malachite Sunbird	Least Concern	53	2023/06/21
Oriolidae	<i>Oriolus larvatus</i>	Eastern Black-headed Oriole	Least Concern	1	2010/08/02
Passeridae	<i>Passer diffusus</i>	Southern Grey-headed Sparrow	Least Concern	68	2023/06/21
	<i>Passer domesticus</i>	House Sparrow	Least Concern	277	2023/07/27
	<i>Passer melanurus</i>	Cape Sparrow	Least Concern	347	2023/07/27
Phylloscopidae	<i>Phylloscopus trochilus</i>	Willow Warbler	Least Concern	10	2022/03/16
Platysteiridae	<i>Batis capensis</i>	Cape Batis	Least Concern	7	2023/04/25
Ploceidae	<i>Euplectes capensis</i>	Yellow Bishop	Least Concern	60	2023/07/02
	<i>Euplectes orix</i>	Southern Red Bishop	Least Concern	284	2023/07/02
	<i>Ploceus capensis</i>	Cape Weaver	Least Concern	303	2023/07/27
	<i>Ploceus velatus</i>	Southern Masked Weaver	Least Concern	156	2023/07/12
	<i>Quelea quelea</i>	Red-billed Quelea	Least Concern	20	2023/07/02
Promeropidae	<i>Promerops cafer</i>	Cape Sugarbird	Least Concern	45	2023/04/26
Pycnonotidae	<i>Andropadus importunus</i>	Sombre Greenbul	Least Concern	255	2023/07/02
	<i>Phyllastrephus terrestris</i>	Terrestrial Brownbul	Least Concern	13	2022/11/02
	<i>Pycnonotus capensis</i>	Cape Bulbul	Least Concern	275	2023/07/27
	<i>Pycnonotus tricolor</i>	Dark-capped Bulbul	Least Concern	22	2022/09/20
Remizidae	<i>Anthoscopus minutus</i>	Cape Penduline-tit	Least Concern	8	2022/05/24
Stenostiridae	<i>Stenostira scita</i>	Fairy Flycatcher	Least Concern	1	1992/12/11
Sturnidae	<i>Lamprotornis bicolor</i>	Pied Starling	Least Concern	3	2020/10/12
	<i>Onychognathus morio</i>	Red-winged Starling	Least Concern	146	2023/07/12
	<i>Sturnus vulgaris</i>	Common Starling	Least Concern	406	2023/08/09
Sylviidae	<i>Curruca layardi</i>	Layard's Warbler	Least Concern	2	2020/03/22
Viduidae	<i>Vidua macroura</i>	Pin-tailed Whydah	Least Concern	119	2023/07/27

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13 Dennelaan, Stilbaai, 6674

	Zosteropidae	<i>Zosterops virens</i>	Cape White-eye	Least Concern	285	2023/07/27
Pelecaniformes	Ardeidae	<i>Ardea alba</i>	Great Egret	Least Concern	3	2021/12/26
		<i>Ardea cinerea</i>	Grey Heron	Least Concern	360	2023/07/27
		<i>Ardea intermedia</i>	Intermediate Egret	Least Concern	19	2023/03/29
		<i>Ardea melanocephala</i>	Black-headed Heron	Least Concern	261	2023/07/12
		<i>Ardea purpurea</i>	Purple Heron	Least Concern	96	2023/07/12
		<i>Bubulcus ibis</i>	Western Cattle Egret	Least Concern	309	2023/07/12
		<i>Egretta garzetta</i>	Little Egret	Least Concern	378	2023/07/27
		<i>Ixobrychus minutus</i>	Little Bittern	Least Concern	34	2023/07/02
		<i>Nycticorax nycticorax</i>	Black-crowned Night Heron	Least Concern	152	2023/07/12
		Scopidae	<i>Scopus umbretta</i>	Hamerkop	Least Concern	5
	Threskiornithidae	<i>Bostrychia hagedash</i>	Hadada Ibis	Least Concern	260	2023/07/27
		<i>Platalea alba</i>	African Spoonbill	Least Concern	107	2023/07/12
		<i>Plegadis falcinellus</i>	Glossy Ibis	Least Concern	69	2023/07/02
		<i>Threskiornis aethiopicus</i>	African Sacred Ibis	Least Concern	340	2023/07/08
Phoenicopteriformes	Phoenicopteridae	<i>Phoeniconaias minor</i>	Lesser Flamingo	Near-Threatened	7	2023/07/27
		<i>Phoenicopus roseus</i>	Greater Flamingo	Least Concern	143	2023/07/27
Piciformes	Indicatoridae	<i>Indicator indicator</i>	Greater Honeyguide	Least Concern	1	2018/05/26
		<i>Indicator minor</i>	Lesser Honeyguide	Least Concern	1	2022/11/02
	Lybiidae	<i>Tricholaema leucomelas</i>	Acacia Pied Barbet	Least Concern	3	2022/01/25
	Picidae	<i>Dendropicos fuscescens</i>	Cardinal Woodpecker	Least Concern	22	2023/06/07
		<i>Dendropicos griseocephalus</i>	Olive Woodpecker	Least Concern	2	2023/03/29
Procellariiformes	Procellariidae	<i>Ardenna grisea</i>	Sooty Shearwater	Near-Threatened	1	2023/03/17
Podicipediformes	Podicipedidae	<i>Podiceps cristatus</i>	Great Crested Grebe	Least Concern	24	2023/06/03
		<i>Podiceps nigricollis</i>	Black-necked Grebe	Least Concern	1	2018/05/20
		<i>Tachybaptus ruficollis</i>	Little Grebe	Least Concern	255	2023/07/27
Sphenisciformes	Spheniscidae	<i>Spheniscus demersus</i>	African Penguin	Endangered	3	2022/02/17
		<i>Bubo africanus</i>	Spotted Eagle-Owl	Least Concern	19	2023/03/16
Strigiformes	Tytonidae	<i>Tyto alba</i>	Common Barn-owl	Least Concern	7	2022/12/25

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13 Dennelaan, Stilbaai, 6674

Struthioniformes	Struthionidae	<i>Struthio camelus</i>	Common Ostrich	Least Concern	20	2023/07/12
Suliformes	Anhingidae	<i>Anhinga rufa</i>	African Darter	Least Concern	308	2023/07/27
	Phalacrocoracidae	<i>Microcarbo africanus</i>	Reed Cormorant	Least Concern	339	2023/08/06
<i>Phalacrocorax capensis</i>		Cape Cormorant	Endangered	132	2023/07/27	
<i>Phalacrocorax lucidus</i>		White-breasted Cormorant	Least Concern	376	2023/08/06	
	Sulidae	<i>Morus capensis</i>	Cape Gannet	Endangered	49	2023/06/21

Appendix C

Appendix C Species list of the faunal species recovered within the study area during the field survey. For each, the taxonomic Order, Family, species binomial name and species common name are shown, along with the current IUCN Red List classification of the species, and the number of records of the species during the surveying period.

Mammals					
Order	Family	Species	Common name	IUCN status	Number of observations
Cetartiodactyla	Bovidae	<i>Sylvicapra grimmia</i>	Common Duiker	Least Concern	1
Rodentia	Bathyergidae	<i>Cryptomys hottentotus</i>	African Mole-rat	Least Concern	2
Avifauna					
Order	Family	Species	Common name	IUCN status	Number of observations
Anseriformes	Anatidae	<i>Alopochen aegyptiaca</i>	Egyptian Goose	Least Concern	1
Charadriiformes	Burhinidae	<i>Vanellus armatus</i>	Blacksmith Lapwing	Least Concern	1
Coliiformes	Coliidae	<i>Colius striatus</i>	Speckled Mousebird	Least Concern	1
Columbiformes	Columbidae	<i>Columba guinea</i>	Speckled Pigeon	Least Concern	1
		<i>Streptopelia capicola</i>	Cape Turtle Dove	Least Concern	1
		<i>Streptopelia semitorquata</i>	Red-eyed Dove	Least Concern	1
Galliformes	Numididae	<i>Numida meleagris</i>	Helmeted Guineafowl	Least Concern	1
	Phasianidae	<i>Pternistis capensis</i>	Cape Spurfowl	Least Concern	1
Passeriformes	Cisticolidae	<i>Cisticola subruficapilla</i>	Grey-backed Cisticola	Least Concern	1
		<i>Cisticola tinniens</i>	Levaillant's Cisticola	Least Concern	2
		<i>Prinia maculosa</i>	Karoo Prinia	Least Concern	2
	Estrildidae	<i>Estrilda astrild</i>	Common Waxbill	Least Concern	1
	Fringillidae	<i>Crithagra sulphurata</i>	Brimstone Canary	Least Concern	1
	Motacillidae	<i>Motacilla capensis</i>	Cape Wagtail	Least Concern	1
	Muscicapidae	<i>Cossypha caffra</i>	Cape Robin-Chat	Least Concern	1
		<i>Saxicola torquatus</i>	African Stonechat	Least Concern	1

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13 Dennelaan, Stilbaai, 6674

	Passeridae	<i>Passer melanurus</i>	Cape Sparrow	Least Concern	2
	Ploceidae	<i>Euplectes capensis</i>	Yellow Bishop	Least Concern	1
		<i>Euplectes orix</i>	Southern Red Bishop	Least Concern	1
		<i>Ploceus capensis</i>	Cape Weaver	Least Concern	1
	Pycnonotidae	<i>Pycnonotus capensis</i>	Cape Bulbul	Least Concern	1
	Sturnidae	<i>Onychognathus morio</i>	Red-winged Starling	Least Concern	1
		<i>Sturnus vulgaris</i>	Common Starling	Least Concern	1
Pelecaniformes	Ardeidae	<i>Ardea intermedia</i>	Intermediate Egret	Least Concern	1
	Threskiornithidae	<i>Threskiornis aethiopicus</i>	African Sacred Ibis	Least Concern	1

Appendix D

Curriculum Vitae of Jacobus Hendrik Visser

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Qualifications

- PhD (Zoology), University of Johannesburg (2015 - 2017)
- MSc (Zoology), Stellenbosch University (2011 - 2013)
- BSc Honours (Zoology) cum laude, Stellenbosch University (2010)
- BSc (Biodiversity and Ecology) cum laude, Stellenbosch University (2007 - 2009)

Scientific publications

- **Visser J.H.** (2013). Gene-flow in the rock hyrax (*Procavia capensis*) at different spatial scales. MSc thesis, Stellenbosch University, Stellenbosch, South Africa. <https://core.ac.uk/download/pdf/37420485.pdf>
- **Visser J.H.** (2017). Evolution of the South African Bathyergidae: patterns and processes. PhD dissertation, University of Johannesburg, Johannesburg, South Africa.

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13 Dennelaan, Stilbaai, 6674

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- **Visser, J.H.** Terrestrial Faunal and Avifaunal Species Compliance Statement Report for a Portion of Brazil 329, Nama Khoi Municipality, Namakwa District. April 2022. Prepared for WNel Environmental Consulting Services.
- **Visser, J.H.** Terrestrial Faunal And Avifaunal Species Scoping Report for the Proposed Waste Management Facility at Portions 1 and 6 of Farm 32 Brakkefontein, City of Cape Town. April 2022. Prepared for SLR Consulting.
- **Visser, J.H.** Terrestrial Faunal And Avifaunal Species Impact Assessment Report for a Portion of Riet Valleij (Somerset Vale, Farm Portion RE/150), Estelm Boerdery, Swellendam Municipality, Overberg District. June 2022. Prepared for PHS Consulting.
- **Visser, J.H.** Site Sensitivity Verification Report for Remainder of Farm De Draay No 563, Overstrand Municipality. August 2022. Prepared for PHS Consulting.
- **Visser, J.H.** Terrestrial Faunal and Avifaunal Impact Assessment Report for Remainder of Farm Rooilandia No. 472, Breede Valley Municipality. October 2022. Prepared for McGregor Environmental Services.
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- **Visser, J.H.** Terrestrial Faunal Species Compliance Statement Report for Farm Portion 49, Hansmoeskraal Farm 202, George Local Municipality. April 2023. Prepared for Sharples Environmental Services cc (SES).
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Other projects

- Southern African Bird Atlas Project 2 (SABAP2)
- Endemism, genetic variance and conservation priorities in the highlands of south-western Africa.
- Biodiversity and ecology of scorpions in the Cape Floristic Region.
- National Biodiversity Assessment 2018: The status of South Africa's ecosystems and biodiversity. Synthesis Report. South African National Biodiversity Institute, an entity of the Department of Environment, Forestry and Fisheries, Pretoria.

Conferences

- Presenter at the 2017 conference of the South African Wildlife Management Association (Presentation title: The influence of commercial game farming on maintaining genetic diversity in the sable antelope (*Hippotragus niger*) and roan antelope (*Hippotragus equinus*))
- Presenter at the 2017 conference of the Zoological Society of Southern Africa (Presentation title: Evolution of the South African Bathyergidae: Patterns and processes)
- Presenter at the 2010 conference of the Zoological Society of Southern Africa (Presentation title: Local and regional scale genetic variation in the Cape dune mole-rat, *Bathyergus suillus*)