

Appendix D1 Ecological Assessment



 **LEGACY** | ENVIRONMENTAL
MANAGEMENT
CONSULTING



**Ecological Assessment for the Endangered
Wildlife Operational Centre (EWOC) located
in the Greater Dinokeng Nature Reserve
Portion 6 of Farm Ruimte-74 in the Dinokeng
Game Reserve, Limpopo Province, is located
within the Bela-Bela Local Municipality, Limpopo
Province**

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Prepared for

Endangered Wildlife Operational Center NPC

Prepared by

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Professional Team

The technical team responsible for the required surveys and impact assessment reporting is presented.

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Specialist Declaration

I, Sam Laurence *Pr. Sci. Nat.*, declare that the work presented in this report is our own and has not been influenced in any way by the developer or the EAP. At no point has the developer asked us as specialists to manipulate the results in order to make it more favourable for the proposed development. We consider ourselves bound to the rules and ethics of the South African Council for Natural Scientific Professions (SACNASP) and the EIA Regulations (2014, as amended). We have the necessary qualifications and expertise (*Pr. Sci. Nat. Zoological Science*) required for developing this specialist report.



Samuel Laurence *Pr. Sci. Nat. Ecology and Zoology*

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1. INTRODUCTION

Enviro-Insight CC was commissioned by the Endangered Wildlife Operational Centre (EWOC) a Non-profit Company (NPC) to perform a Basic Assessment compliant Flora and Fauna Assessment for the proposed veterinary, education and training facility on Portion 6 of Farm Ruimte-74 in the Dinokeng Game Reserve, Limpopo Province, South Africa. The study area falls entirely within the Springbokvlakte Thornveld vegetation type (Figure 1), which has been classified as Endangered due to the low levels of erosion and sensitive high clay soils (Mucina & Rutherford 2006; Table 1). It is not as resilient to high levels of disturbance as other regional vegetation and currently experiences some severe pressure from alien invasive vegetation as well as the expansion of high-density development. The study was carried out to conform to the auspices for a Basic Assessment level Flora and Fauna Assessment, where the ecological baseline (including unrelated current impacts from previous agricultural disturbance) was evaluated against the potential impacts from the proposed development and where mitigation measures were suggested to decrease the severity of said potential impacts. The attributes of the vegetation types are shown as Table 1.

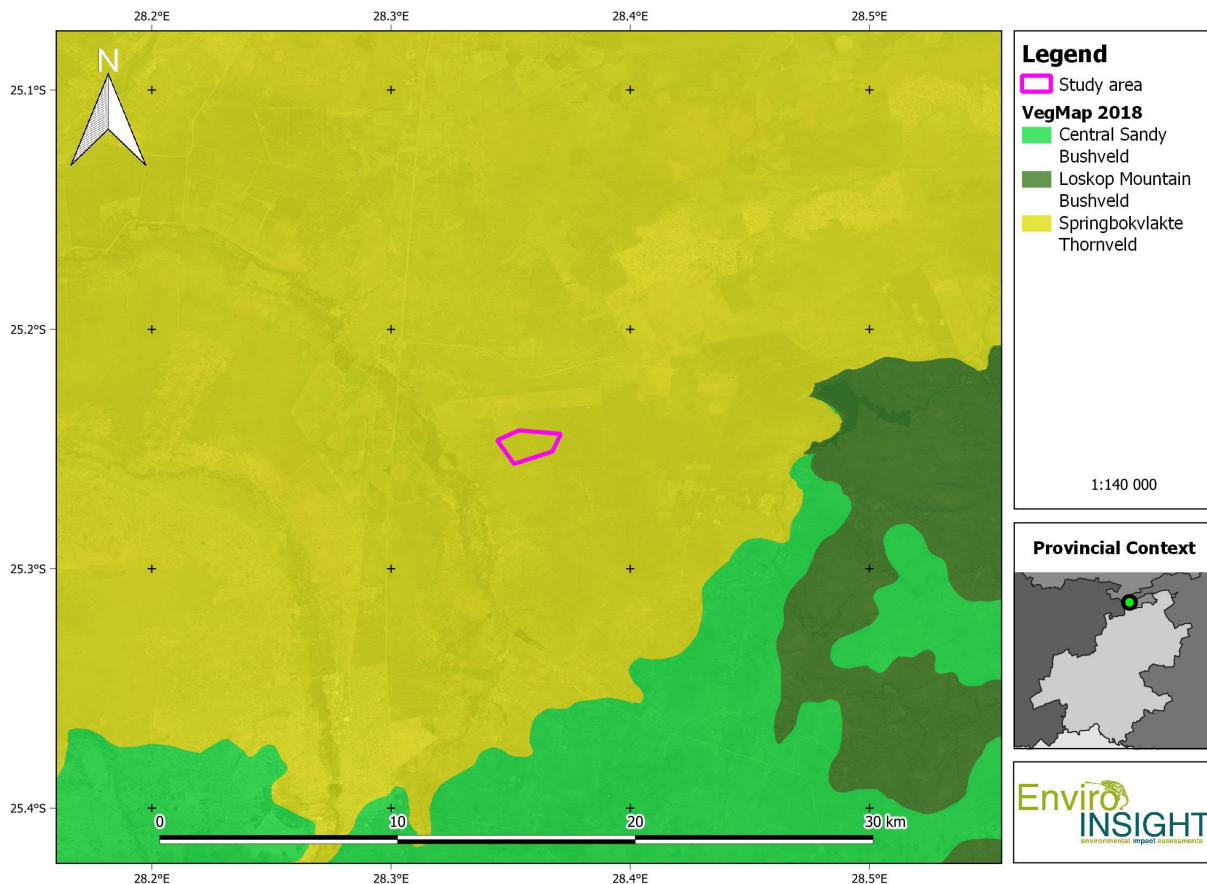


Figure 1. Locality map for the Project site in conjunction with Mucina and Rutherford Regional Vegetation

Table 1: Attributes of the Springbokvlakte Thornveld regional vegetation type

Name of vegetation type	Springbokvlakte Thornveld
Code as used in the Book - contains space	SVcb 15
Conservation Target (percent of area) from NSBA	19%
Protected (percent of area) from NSBA	1.0 %
Remaining (percent of area) from NSBA	0.507 %
Description of conservation status from NSBA	Endangered
Description of the Protection Status from NSBA	Hardly Protected
Area (sqkm) of the full extent of the Vegetation Type	8797.037
Name of the Biome	Savanna Biome

2. METHODOLOGY

2.1. NATIONAL ENVIRONMENTAL SCREENING TOOL REPORTS

In accordance with the terrestrial animal species protocol and the terrestrial plant species protocol, published in Government Notice No. 1150 of 30 October 2020, the National Environmental Screening Tool was consulted to provide a list of species of conservation concern (ASCC) potentially affected by the proposed facility. This was performed during the inception of the project (9 November 2021).

2.2. LITERATURE REVIEW

Information relating to species of conservation concern (SCC) was obtained from the iucnredlist.org (2022). Avifaunal SCC were cross referenced with the Southern Africa Bird Atlas Project (SABAP 2), Hockey *et al.* (2005) and Taylor *et al.* (2015). Mammal SCC information was obtained from Skinner and Chimimba (2005), while information on reptiles and amphibians SCC was obtained from Bates *et al.* (2014) and Du Preez and Carruthers (2009), respectively. In addition, the online Virtual Museum (VM) facility of the Animal Demography Unit (ADU) of the University of Cape Town (<http://vmus.adu.org.za>) was queried for the presence of SCC within the quarter degree grid cell in which the proposed development resides (2723CB). Plants were identified using Van Oudtshoorn (2004) and Van Wyk & Van Wyk (1997). Species nomenclature follows the aforementioned references throughout this document except for herpetofauna, where nomenclature for reptiles follows ReptileMAP (2022)¹ as new distribution data and taxonomic changes have

¹ <http://vmus.adu.org.za/>, formerly SARCA

already occurred since publication of Bates *et al.* (2014). Similarly, the Frog Atlas of Southern Africa (FrogMap 2022) provides information on the geographic distributions of amphibians and keeps up-to-date with the latest taxonomic changes. The use of these online facilities is justified as it not only includes the latest verified publicly contributed data but also a complete record of the museum material in South Africa. The applicability of the information obtained from the literature sources was evaluated for the study area, and the subsequent recommendations are to be used by the client in order to drive the development process in accordance with the relevant legislation.

It must be noted that even though all the above literature was extensively consulted, the combination of the Screening Tool and the on-site field study ensured that not all literature was relevant to the project results write up.

2.3. SPECIES OF CONSERVATION CONCERN

The Red List of threatened species generated by the IUCN (<http://www.iucnredlist.org/>) provided the global conservation status of fauna and flora. For Avifauna, Taylor *et al.* (2015) produced a regional conservation status assessment following the IUCN criteria, which was used for this assessment as it is more relevant and also required by SANBI (2020).

The extinction risk categories defined by the IUCN, which are considered here to represent species of conservation concern (SCC), are defined as follows:

- **Critically Endangered (CR)** - Critically Endangered refers to species facing immediate threat of extinction in the wild.
- **Endangered (EN)** - Endangered species are those facing a very high risk of extinction in the wild within the foreseeable future.
- **Vulnerable (VU)** - Vulnerable species are those facing a high risk of extinction in the wild in the medium-term.
- **Near Threatened (NT)** - any indigenous species which does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

The first three categories i.e., Critically Endangered, Endangered and Vulnerable, are collectively referred to as a 'threatened' species. The National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA) provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. NEMBA also deals with endangered, threatened and otherwise controlled species, under the Threatened or Protected Species Regulations (ToPS).

The tree marking component of the study represents the primary ecological recommendation of any **required** (see Professional Opinion below) biodiversity related Environmental Management Programme (EMPr) phase and was carried out pre-emptively of any official design and implementation of the EMPr. This component was done in compliance with various relevant legislation, outlined below.

2.4. PROTECTED TREES

One relevant piece of legislation was used to guide the tree-marking component of the study, namely Section 15 (3) of the National Forest Act (Act 84 of 1998), and referring specifically to Section 12 (1).

Where possible, protected trees found within the proposed project footprint (i.e., possibly necessitating their removal or felling) were marked and enumerated. In accordance with legislation, the specialist must;

- (a) Name and define the quantity of trees.

The EMPr phase (verification) involved a detailed vegetation assessment of the proposed project footprint. During this phase, a number of protected tree and plant species were identified as potential candidates to be marked and numbered in accordance with the legislation. The relevant species are listed within the survey area as:

- Marula (*Sclerocarya birrea caffra*)
- Shepard's Tree (*Boscia albitrunca*)

2.5. EXAMPLE OF LEGISLATION SPECIFICS – ENVIRONMENTAL LEGALITIES

The following “*verbatim*” text represents an example of the legislative requirements to be followed in relation to protected trees. All the relevant legislation as listed above should be referred to in the application process and adhered to in accordance with the requirements of any EMPr that will only be triggered in the case of the required removal of protected tree species.

“By virtue of powers vested in me under Section 15(3) of the National Forests Act, 1998, I, Tina Joemat-Pettersson, Minister of Agriculture, Forestry and Fisheries hereby publish a list of all protected trees belonging to a particular species under Section 12(1) (d) set out in Schedule below. The effect of this declaration is that in terms of Section 15(1) of the National Forests Act, 1998, no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a licence or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated. Contravention of this declaration is regarded as a first category offence that may result in a person who is found guilty of being sentenced to a fine or imprisonment for a period up to three years, or to both a fine and imprisonment”

“A licence application is relevant to the use of land, structures or buildings for agricultural, domestic, residential, industrial, communications, transportation or commercial purposes. Any person, organ of State or organization may apply to the Minister for a licence for the use of land for agricultural, domestic, residential, industrial, communications, transportation or commercial purposes {section 7(1)}. No licence which has been applied for under this regulation may be granted, unless –

(a) tenders have been called for; or

(b) the Minister has by notice done away with the requirement for tenders {section 7(4)}.

Chapter 5 of Act 84 of 1998 (Protection of Trees and Forests) deals with licences for activities in respect of indigenous trees in natural forests or their products. Section 15(1) states that any person, organ of State or organization may apply to the Minister for a licence under section 7(4) of the Act (mentioned above) to do anything referred to in section 7(1) of the Act (above). Section 15(2) qualifies that an application for a licence brought in terms of subregulation (1) must -

- (a) state the purpose for engaging in the activity applied for, and
- (b) name and define the quantity of the trees.

Section 16(1) dealing with licences for activities in respect of protected trees (own emphasis) or forest products derived from protected trees states that any person, organ of State or organization may apply to the Minister for a licence to do anything referred to in section 15(1) – above. Section 16(2) states that an application for a licence brought in terms of subregulation (1) must –

- a) state the purpose for engaging in the activity applied for; and
- b) name and define the quantity of trees.

Compliance with Section 16(2) of Act 84 of 1998

- a) state the purpose for engaging in the activity applied for.”

2.6. FIELDWORK

2.6.1 Field Assessment

The field assessment was conducted by a SACNASP Registered Professional Ecologist and Zoologist in both February 2021 and March 2022, where the botanical and the faunal aspects of the survey area were evaluated. The timing of the studies represented mid wet-season conditions which was optimal. During the field survey, the proposed development site was evaluated on foot and a series of georeferenced photographs were taken of the habitat attributes. The field survey focused on a classification of the observed fauna, flora, habitats as well as the actual and potential presence of species of conservation concern in South Africa (either classified as Threatened by the IUCN (2022, protected by NEMBA (2014) or indeed other legislations applicable provincially or nationally). Faunal and Floral trigger species identified by the National Environmental Screening Tool were assessed and an analysis of the diversity and ecological integrity of the habitats present on site was also performed.

2.6.2 Walked Transects

This method was utilised to collect an inventory of flora, fauna (specifically bird species) within the major habitat types within the study area. A sampling transects was conducted and was largely representative of the biotopes present within the study area. The observer recorded all bird contacts (both seen and heard) by walking slowly along through the survey area. Any habitats within the broader impact zone of the proposed facility, deemed likely to support nest sites of key species of conservation concern, were searched and surveyed. In addition, all evidence of breeding activity and the outcomes of such activity, where possible, was recorded.

2.6.3 Incidental Observations

All other sightings of species of conservation concern (and particularly those suggestive of breeding or important feeding or roosting sites or flight paths) within the study area were recorded, along with additional relevant information such as habitat type and abundance.

2.7. PROTECTED TREE SPECIES ASSESSMENT

The specialist ecologists traversed the proposed project footprint searching for sensitive habitats and the target tree species. As stated above, specialists would operate on foot. All trees found within the project footprint were marked with a GPS and photographed (georeferenced). All heights of marked trees can be provided upon request.

The GIS technique described above provided the maximum number of trees that may need to be felled, information that can (if required by design) then feed into the licence application as stipulated in the relevant Act. All the relevant waypoints of all the marked trees must be provided as an attachment to the licence application and are provided with this document. The licence must be submitted to the relevant governing body only if protected tree species are removed in the construction process.

2.7.1. Species-specific information

Identification of the tree species were supplemented from VanWyk and Van Wyk (1997) and Coates and Pelgrave (2005).

***Sclerocarya birrea caffra* (Marula or Maroela):** Maroela trees are tall bushveld species, often growing in association with woodland assemblages. The species is dioecious and requires both male and female individuals to grow in proximity to each other. The trees are sought after for fruit production, are heavily utilised for timber and are sporadically common within the project area.

***Boscia albitrunca* (Shepard's Bush):** Frequently occurring bushveld species found within the project footprint.

2.8. IMPACT ASSESSMENT

The following Impact Assessment Methodology described in Table 2 was used.

Table 2. Impact Table Methodology

ITEM	DEFINITION
EXTENT	
Local	Extending only as far as the boundaries of the activity, limited to the site and its immediate surroundings
Regional	Impact on the broader region
National	Will have an impact on a national scale or across international borders
DURATION	

Short-term	0-5 years
Medium- Term	5-15 years
Long-Term	>15 years, where the impact will cease after the operational life of the activity
Permanent	Where mitigation, either by natural process or human intervention, will not occur in such a way or in such a time span that the impact can be considered transient.
MAGNITUDE OR INTENSITY	
Low	Where the receiving natural, cultural or social function/environment is negligibly affected or where the impact is so low that remedial action is not required.
Medium	Where the affected environment is altered, but not severely and the impact can be mitigated successfully and natural, cultural or social functions and processes can continue, albeit in a modified way.
High	Where natural, cultural or social functions or processes are substantially altered to a very large degree. If a negative impact then this could lead to unacceptable consequences for the cultural and/or social functions and/or irreplaceable loss of biodiversity to the extent that natural, cultural or social functions could temporarily or permanently cease.
PROBABILITY	
Improbable	Where the possibility of the impact materialising is very low, either because of design or historic experience
Probable	Where there is a distinct possibility that the impact will occur
Highly Probable	Where it is most likely that the impact will occur
Definite	Where the impact will undoubtedly occur, regardless of any prevention measures
SIGNIFICANCE	
Low	Where a potential impact will have a negligible effect on natural, cultural or social environments and the effect on the decision is negligible. This will not require special design considerations for the project
Medium	Where it would have, or there would be a moderate risk to natural, cultural or social environments and should influence the decision. The project will require modification or mitigation measures to be included in the design
High	Where it would have, or there would be a high risk of, a large effect on natural, cultural or social environments. These impacts should have a major influence on decision making.
Very High	Where it would have, or there would be a high risk of, an irreversible negative impact on biodiversity and irreplaceable loss of natural capital that could result in the project being environmentally unacceptable, even with mitigation. Alternatively, it could lead to a major positive effect. Impacts of this nature must be a central factor in decision making.
STATUS OF IMPACT	
Whether the impact is positive (a benefit), negative (a cost) or neutral (status quo maintained)	
DEGREE OF CONFIDENCE IN PREDICTIONS	

The degree of confidence in the predictions is based on the availability of information and specialist knowledge (e.g. low, medium or high)

MITIGATION
Mechanisms used to control, minimise and or eliminate negative impacts on the environment and to enhance project benefits Mitigation measures should be considered in terms of the following hierarchy: (1) avoidance, (2) minimisation, (3) restoration and (4) off-sets.

Scoring System for Impact Assessment Ratings

To comparatively rank the impacts, each impact has been assigned a score using the scoring system outlined in Table 3 below. This scoring system allows for a comparative, accountable assessment of the indicative cumulative positive or negative impacts of each aspect assessed.

Table 3. Impact Scoring System

IMPACT PARAMETER	SCORE	
Extent (A)	Rating	
Local	1	
Regional	2	
National	3	
Duration (B)	Rating	
Short term	1	
Medium Term	2	
Long Term	3	
Permanent	4	
Probability (C)	Rating	
Improbable	1	
Probable	2	
Highly Probable	3	
Definite	4	
IMPACT PARAMETER	NEGATIVE IMPACT SCORE	POSITIVE IMPACT SCORE
Magnitude/Intensity (D)	Rating	Rating
Low	-1	1
Medium	-2	2
High	-3	3

SIGNIFICANCE RATING (F) = (A*B*D) *C	Rating	Rating
Low	0 to - 40	0 to 40
Medium	- 41 to - 80	41 to 80
High	- 81 to - 120	81 to 120
Very High	> - 120	> 120

3. RESULTS

3.1. STUDY LIMITATIONS AND IMPLICATIONS TO THE PROPOSED DEVELOPMENT

- The level of study did not warrant long-term trapping methods (i.e., small mammal trapping, herpetofauna trapping, camera trapping, night surveys, and phytosociological delineation). The confidence in the assessment derived from the literature review and fieldwork data, however, is high due to the *status quo* of the study area and the size of the study area (relatively small);
- A Site Development Plan (SDP) showing the exact infrastructure was provided/ evaluated, and the assessment is thus based on the development of the entire study site.
- Due to the nature of most biophysical studies, it is not always possible to cover every square metre of a given study site. Due to factors such as thick grass swards or vegetation stands, it is conceivable that small individual plant species of conservation concern may have been overlooked.
- No wetland report was made available to the consultant at the time of the study and a formal delineation was not used to formulate the faunal and floral conclusions. For the project area footprint, it is not anticipated that further studies will be required although any undisclosed supporting infrastructure (powerlines and roads) not indicated within the Site Development Plan will trigger the need for an amendment to the EA.

3.2. REVIEW OF NATIONAL ENVIRONMENTAL SCREENING TOOL FAUNA LIST

The list of fauna species of concern generated by the National Environmental Screening Tool included two ASCC expected for the study area, namely) and the Cheetah (*Acinonyx jubatus*) and the Maquassie Musk Shrew (*Crocidura maquassiensis*). In addition, the Tawny Eagle (*Aquila rapax* and Grass Owl (*Tyto alba*) have been identified as species of concern (Figure 2). The list of floral species of concern generated by the National Environmental Screening Tool included *Cullen holubii* (Figure 3) and Sensitive Species 1252 (not mentioned for security reasons). The cheetah is confined to the fenced area of Dinokeng and was not considered to be relevant while Sensitive Species 1252 was identified from SANBI, searched for and has a negligible likelihood of occurrence. Both species do not require further discussion.

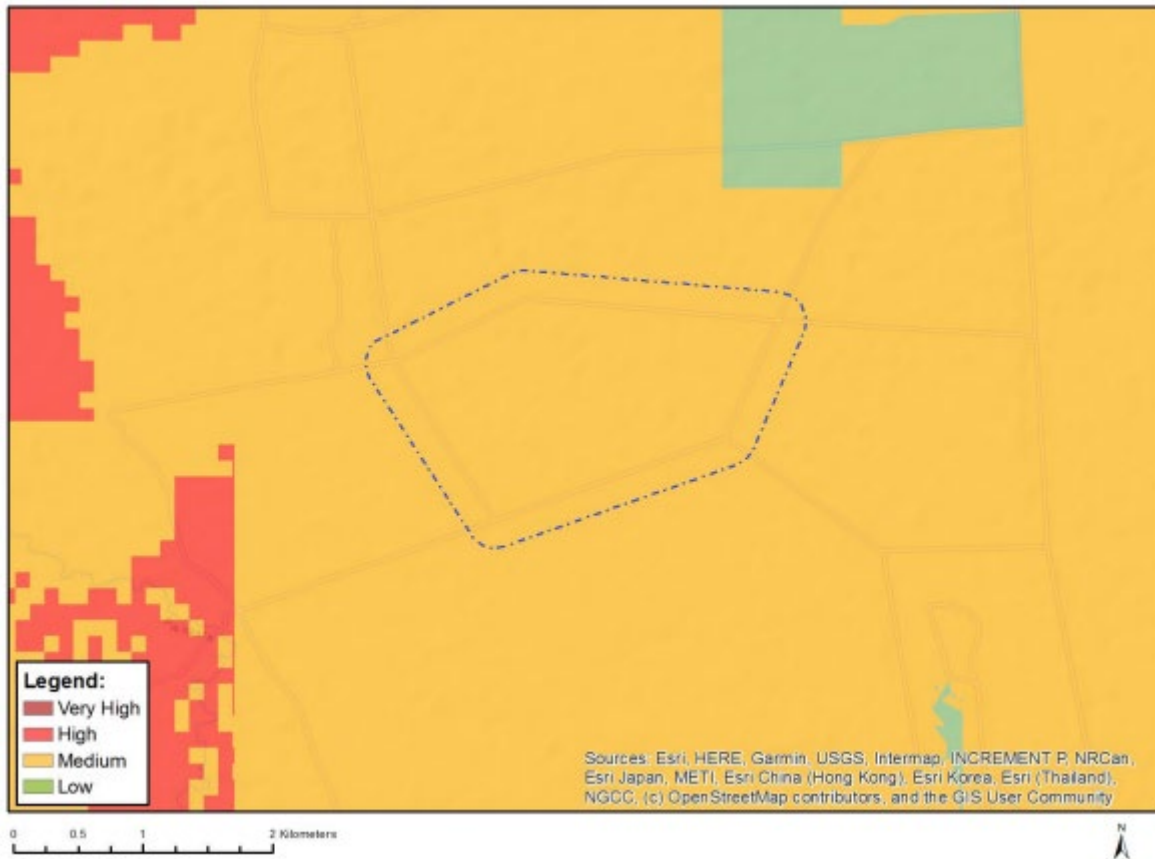


Figure 2: Screening Tool Report on the Animal Species Theme.

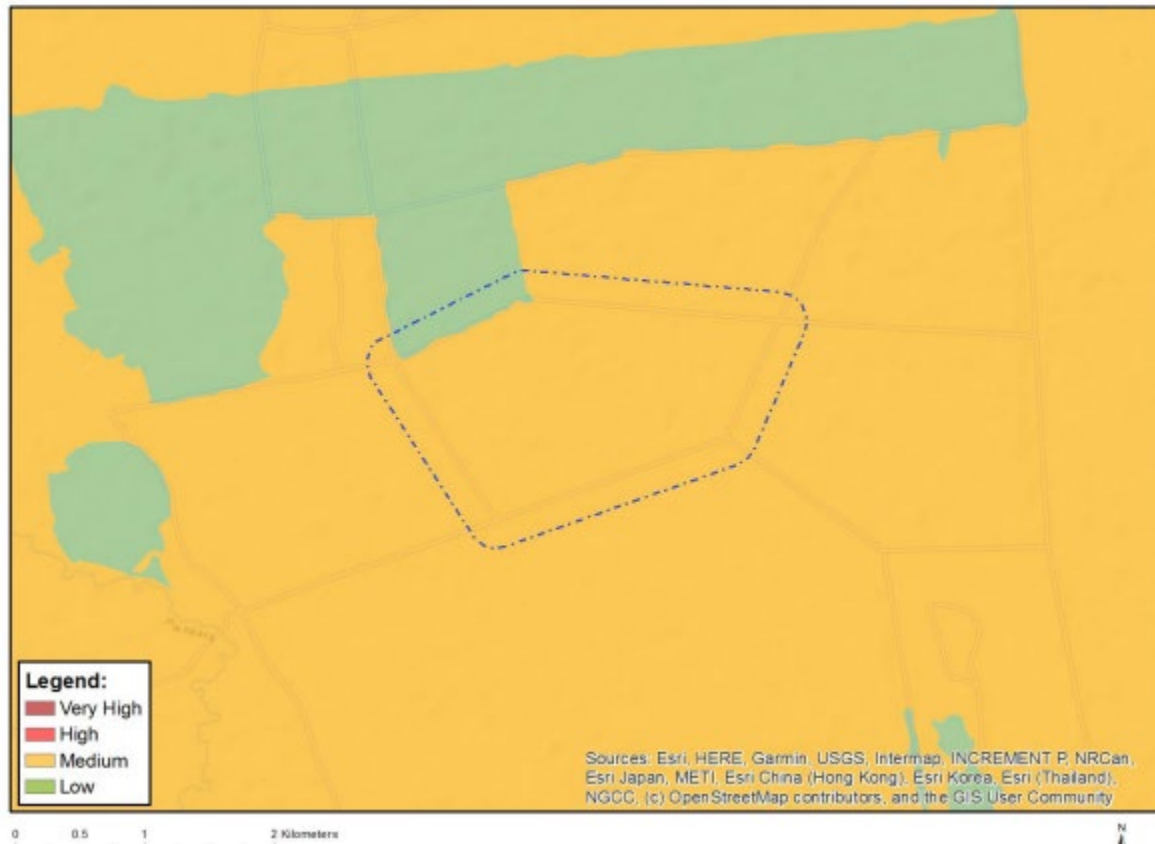


Figure 3: Screening Tool Report on the Plant Species Theme.

3.3. GENERAL HABITAT CHARACTERISTICS

The general habitat types in relation to the development are shown in Figure 4. Habitat types with similar attributes are discussed together below. Overall, the habitats overlap significantly and the deliberation thereof will not have a substantial outcome on the mitigation of impacts.

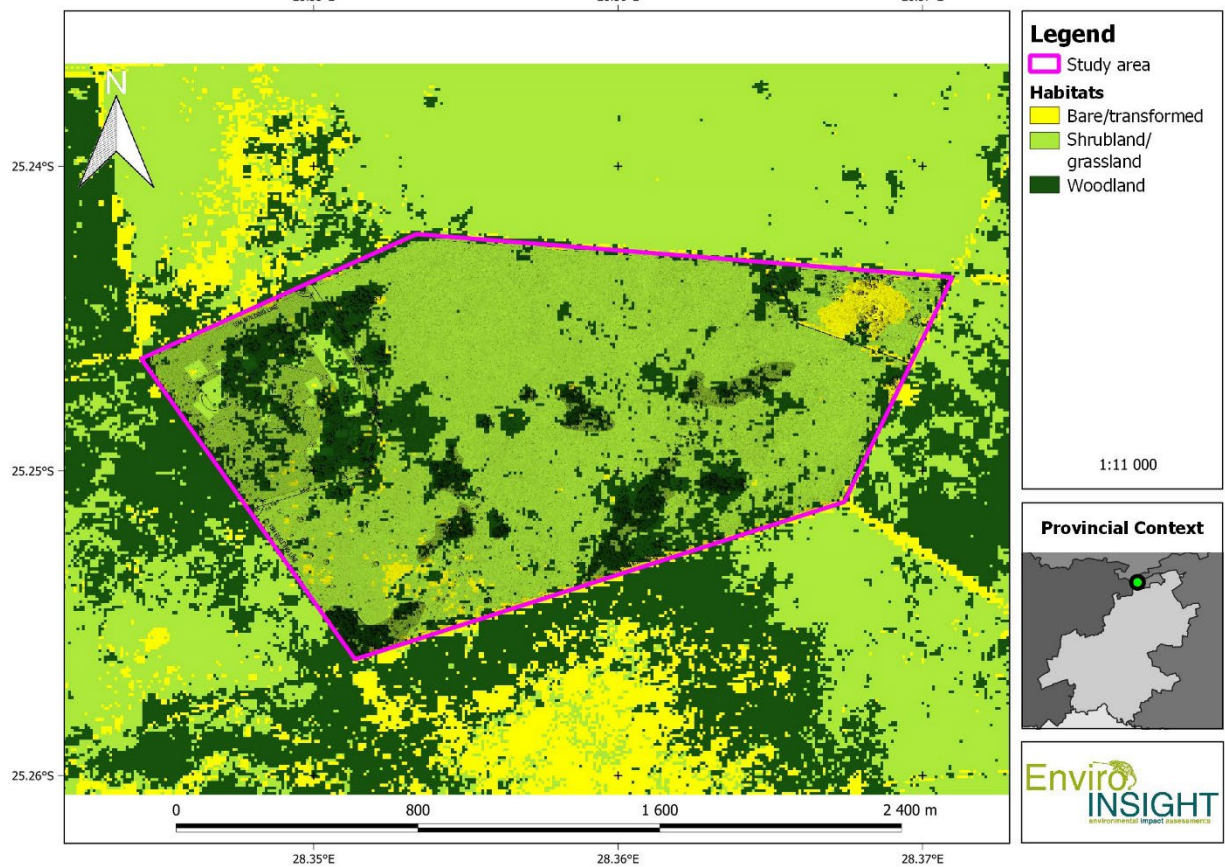


Figure 4. Delineation of major habitat types in relation to the facility

3.3.1. Shrubland/Grassland

This habitat is highly transformed due to predominantly livestock (cattle and sheep) agricultural activities. This habitat consists mostly of open grasses shrubland with *Combretum apiculatum*, *Peltophorum africanum*, *Dichrostachys cinerea*, *Searsia leptodictya*, *Vachellia tortillis* and *Euclea crispa* dominating the species composition. Alien and invasive plant species occurring; *Schkuhria pinnata* (Dwarf marigold), *Tagetes minuta* (Khaki-weed) and *Bidens pilosa* (Blackjack).



Figure 5. Old Agricultural fields.



3.3.2. Woodland

This habitat is only moderately transformed due to livestock agricultural activities. The landscape consists mostly of natural scrub with a moderate shrub layer and may attract seed eaters and foraging raptors which will be seasonally prevalent (Figure 6). Some of the vegetation from the herbaceous layer has been removed, with some indigenous trees standing within the overall development footprint. Indigenous tree species include *Combretum apiculatum*, *Peltophorum africanum*, *Ziziphus mucronata*, *Euclea crispa*, *Vachellia nilotica*, *Pappea capensis*, *Combretum hereroense* and *Dombeya rotundefolia*.

Alien species include *Pennisetum clandestinum* (Kikuyu grass), as well as unnatural introduction of alien and invasive species for horticultural reasons.

The impacts within phase1 include the removal of the herbaceous layer as well as some topsoil, impacts associated with prior grazing practices. Electrical fencing that surrounds phase 1 that may impede natural migrations of fauna, especially reptiles.

Figure 6. Natural and Disturbed Natural.

3.4. SPECIES-SPECIFIC RISK

Table 4 provides a discussion on Red Listed species, their likelihood of occurrence and relevant risks from the development.

Table 4: Analysis of avifauna species of conservation concern (ASCC) potentially occurring within the study area.

Common Name	Scientific Name	IUCN Status (Regional)	IUCN Status (Global)	Habitat Association	Probability of Occurrence	Justification
–	<i>Cullen holubii</i>	VU	VU	Transformed lands and Woodlands. cultivated Savanna	Low (not confirmed adjacent)	One collection cited by Burt Davy (1932) is from the Zeerust district near the border with Botswana. All other known collections of this species are, however, from the Springbokvlakte between Bela Bela and Pretoria, where subpopulations of this species are threatened by ongoing habitat loss and degradation. However, the survey area was highly degraded, and the soil characteristics were atypical of the Springbokvlakte Thornveld.
Tawny Eagle	<i>Aquila Rapax</i>	EN	VU	Favours open Savanna Woodlands.	Low albeit Locally Confirmed	This species has a low SABAP2 reporting rate in the area and has only been reported within one isolated Pentad. However, some preferred habitat is present on site. Due to a high number of guides and reporters present in the area, high densities of the species would be noticed and reported and thus, the species is expected to be a non-breeding visitor in the study area, even if only soaring overhead or temporarily perching in the area.
African Grass Owl	<i>Tyto alba</i>	VU	EN	Favours open grassland, associated with <i>Imperata</i> wetlands).	Very Low	Although, this species often utilises agricultural fields and wetlands that are present in the region (and indeed Dinokeng Reserve), the study area is completely unsuitable in regard to permanent breeding habitat and indeed foraging habitat for the species.
Maquassie Musk Shrew	<i>Crocidura maquassiensis</i>	EN	EN	Wetland and associated moist grasslands.	Very Low	The species is highly understudied but is said to be integrated within moist grasslands. Although the habitat is available within the Dinokeng Nature Reserve, no available habitat is located within the project footprint.

3.5. SITE ECOLOGICAL IMPORTANCE (SEI)

As described in the species protocol guidelines (SANBI 2020), Site Ecological Importance (SEI) is a “standardised metric for identifying site-based ecological importance for species, in relation to a proposed project with a specific footprint and suite of

anticipated activities”. SEI allows for rapid spatial inspection and evaluation of impacts of a proposed development within the context of on-site habitats and SCC, and also facilitates the integration of inputs from different specialist studies.

SEI was evaluated for each of the habitats discussed and the detailed evaluation is presented in Table 5 below. The spatial representation of this SEI evaluation is presented in Figure 7. The proposed facility intersects with mostly Very Low SEI.

Table 5: Evaluation of Site Ecological Importance (SEI) of avifauna habitats in the study area. BI = Biodiversity Importance.

Habitat	Conservation Importance (CI)	Functional Integrity (FI)	Receptor Resilience (RR)	Site Ecological Importance (SEI)
Shrub Grassland	Very Low – Despite the Tawny Eagle (Regional EN [A2acde+3cde+4acde]; Global: VU, [A4acd; C1]) being observed in the greater region and in similar habitat, the CI of this habitat cannot be assigned as High. This is because Tawny Eagles forage widely and opportunistically. Consequently, the CI is considered to be Very Low instead of High, because this species is not reliant on this habitat for survival and they do not breed in this habitat. For all other species identified by the Screening Tool, the habitat was entirely unsuitable.	Very low - Several major current negative ecological impacts such as trampling and alien/invasive species infestation.	Low - Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality.	LOW (BI = Low)
Woodland	Very Low – As above	Very low - (< 100 ha) intact area for any conservation status of ecosystem type, moderate habitat connectivity serving as functional ecological corridors, significant current negative ecological impacts.	Low - Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality.	VERY LOW (BI = Very Low)

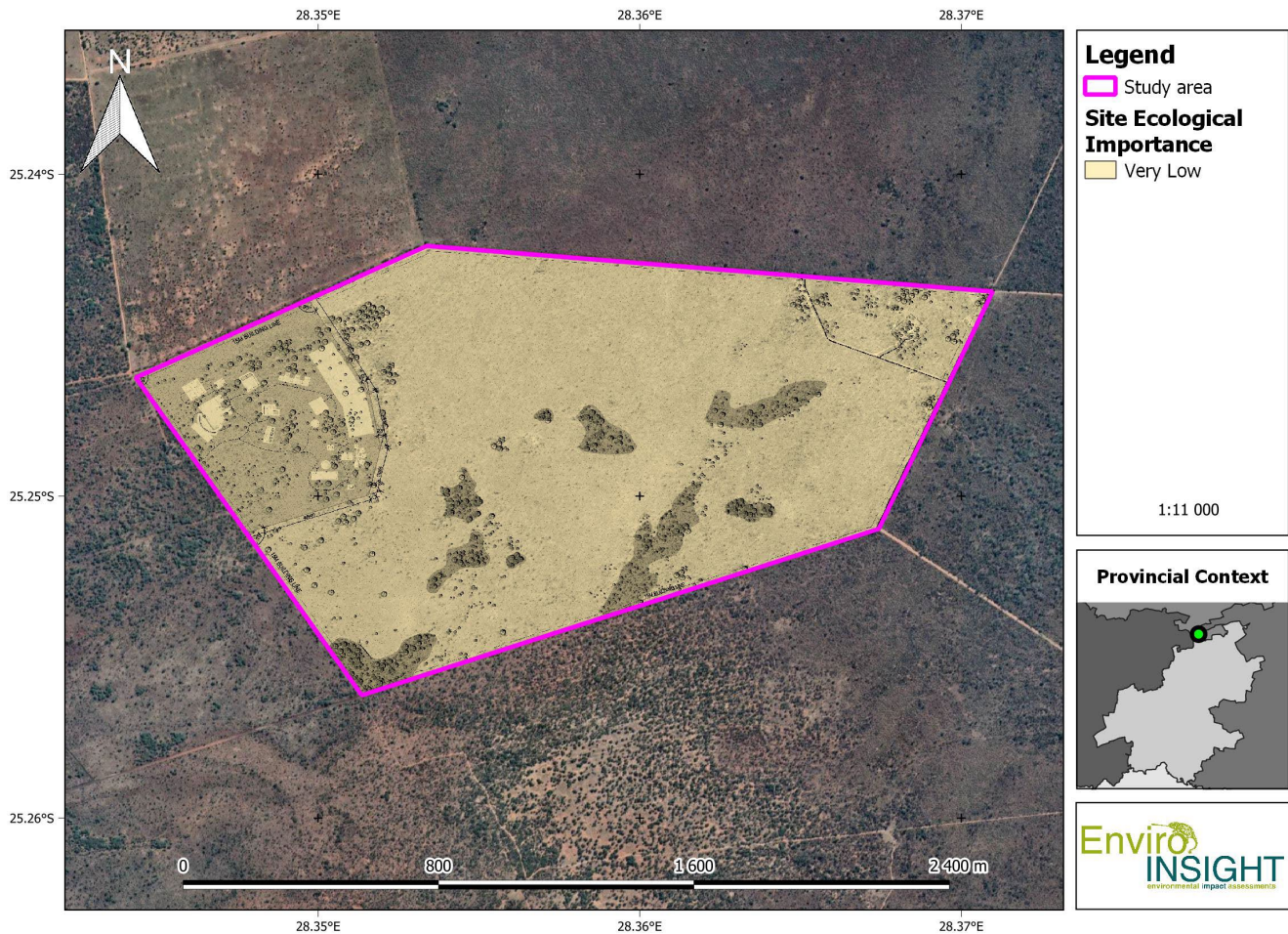


Figure 7: Site Ecological Importance (SEI) of the study area.

3.6. BUFFERS

The species protocol guidelines (SANBI 2020) provide recommendations regarding buffers for sensitive ASCC depending on the receptor attribute (e.g. nesting or foraging) and the intensity of the impact. No ASCC were observed or expected in the study area as most of the Screening Tool triggered species are associated with the drainage lines, moist grasslands and wetland habitats that occur in the region and not on the project footprint. None of the habitats within the project footprint area therefore warrant buffering.

3.7. MAJOR ANTICIPATED IMPACTS TO ASCC

A comprehensive environmental impact assessment (EIA) following the methodology has been compiled and is presented in the Environmental Impact Assessment. The following represents a short discussion on the potential major impacts to ASCC in relation to the site ecological importance evaluated above.

1. Habitat loss & degradation – project overlaps with the Very Low SEI habitats of the project area (Figure 7).

SANBI (2020) recommends avoidance mitigation wherever possible for High SEI areas. If avoidance mitigation is not possible, SANBI (2020) recommends offset mitigation for high impact activities within High SEI. In the case of the EWOC project, this does not apply and overall, SANBI (2020) recommends minimisation and restorative mitigation. This applies to the 13 recorded ToPs protected tree species for which removal should be avoided and the individual trees integrated into the project design.

3.8. PROTECTED TREE SPECIES

In total, 13 georeferenced protected *Boscia albitrunca* trees were recorded during the fieldwork phase. Figure 8 shows the locations of the protected trees marked and the shapefiles of all marked locations are available to the client.

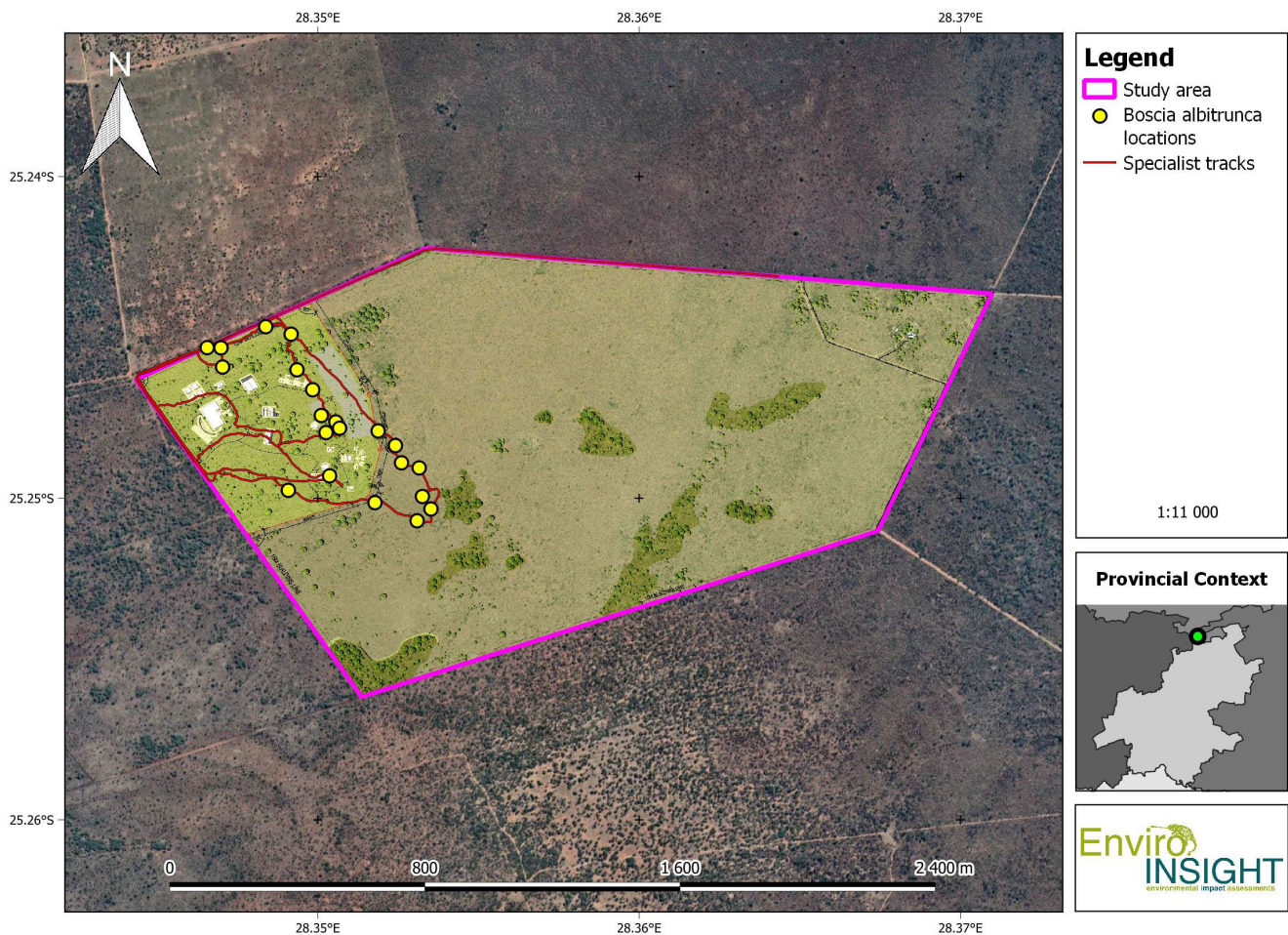


Figure 8: Protected tree locations

4. IMPACT ASSESSMENT

4.1. BACKGROUND TO INTERACTIONS BETWEEN INFRASTRUCTURE DEVELOPMENT (INCLUDING SUPPORTING POWER LINES) AND HABITAT, TERRESTRIAL FAUNA AND BIRDS

The effects of infrastructure on the local habitat is highly variable and depend on a wide range of factors including the design and specification of the development, the topography of the surrounding land, the habitats affected and the number of species of birds present.

Typical potential impacts include (but are not necessarily limited to):

- Habitat loss (including foraging and breeding) and fragmentation due to displacement (avoidance of disturbance) (Table 6);

Table 6: Habitat loss and fragmentation impacts during the construction phase.

<p>Impact: Habitat loss and fragmentation</p> <p>Access roads infrastructure construction may necessitate the removal of foraging and roosting habitat, destruction or disturbance of floral and faunal breeding habitats, bird roosts and sensitive habitats such as migratory routes. This will occur during the construction phase and sensitive areas include tall emergent trees, flight paths to the adjacent hills and koppies, the drainage lines and seasonal free-standing water (dams and wetlands) across the study area.</p>			
Impact	Nature of impact	Extent	No-Go Areas
Habitat destruction due to construction of infrastructure.	Negative, especially species utilising tree roosts, habitats for foraging and breeding, as well as migratory pathways.	Local	Large emergent trees and protected tree species
<p>Description of expected significance of impact:</p> <p>The relatively small operational footprint of the development will reduce the overall expected significance of the impact. Due to the poor overall SEI of the habitats, the impact should be low. As far as possible, all roads must utilise and upgrade existing farm roads to avoid further destruction of habitat. All identified protected trees (<i>Boscia albitrunca</i>) must be left intact or else subjected to a destruction permit.</p>			
<p>Gaps in knowledge and recommendations for further study</p> <p>Areas that might be important for avifaunal activity, especially migratory pathways, will most likely not change over time in response to infrastructure establishment or other developments in the area.</p>			

4.2. IMPACT ASSESSMENT

This section provides detailed evaluation of each of the anticipated impacts on a from the proposed facility. A summary overview of these impacts is provided in Table 7 followed by more detailed evaluation of each impact in turn.

Table 7: Summary of potential negative impacts evaluated pre-mitigation and post-mitigation.

Impact	Pre-mitigation Significance	Post-mitigation Significance	Specialist Confidence	Residual Impacts	Potential Fatal Flaw
Loss or destruction of faunal and floral habitat	Low	Low	High	No	No
Loss or ToPs Protected Tree Species	Low	Low	High	No	No

Impacts associated with the loss of faunal and floral habitat due to construction activity (Table 8) can be mitigated by avoiding specific sensitive areas and their associated buffers, such as the protected/ emergent trees.

Table 8: Loss or destruction of faunal and floral habitat

Nature: Habitat destruction during the construction phase		
	Without mitigation	With mitigation
Extent	1	1
Duration	1	1
Magnitude	-2	-1
Probability	4	3
Significance	Low (-8)	Low (-3)
Status (positive or negative)	Negative	Negative
Reversibility	Medium	Low
Irreplaceable loss of resources?	Medium	Low
Can impacts be mitigated?	Yes	
Mitigation: Avoidance of sensitive habitats and minimisation of construction footprint. Supporting activities shall be confined to already transformed areas.		

Table 9: Loss of TOPs protected species

Nature: Habitat destruction during the construction phase		
	Without mitigation	With mitigation
Extent	1	1
Duration	1	1

Magnitude	-2	-1
Probability	4	1
Significance	Low (-8)	Low (-1)
Status (positive or negative)	Negative	Negative
Reversibility	Medium	High
Irreplaceable loss of resources?	Medium	Nil
Can impacts be mitigated?	Yes	
Mitigation: Avoid removal of protected tree species		

4.3. CUMULATIVE IMPACTS

The proposed development will create additional roads and increase vehicle traffic on-site and in the immediate area. Additional roads and higher traffic volumes are expected to result in increased roadkill incidence for fauna, even with mitigation measures in place. Habitat destruction from infrastructure placement and project activities are expected to further reduce the potential foraging and breeding habitat for ASCC in the area and will result in indirect negative impacts to the environment. Dust effects on flora may occur.

4.4. PROTECTED TREE MITIGATIONS

4.4.1. Protected Trees

The following total figures were calculated in regards to any pending application for removal of protected trees and plants:

- 13 trees and plant stands as an actual count
- The final figure of 13, representing actual marked protected trees should be fed into any application process

The end result of this protected tree assessment is that an estimated 13 individual protected trees of one recorded species may need to be removed/felled for the successful construction and operation of this facility.

The following information was obtained from the Centre for Wildlife Management, University of Pretoria. The figures provided are not exact, but rather estimates based on prior management plans and official quotations no older than two years. It is estimated that moving each tree (to another location) will cost approximately R9000 for a 5-6 m tree with a stem diameter not exceeding 30 cm, and R 12000 for a 6-8 m tree with a stem diameter of 40 to 50 cm. The average cost is thus estimated to be approximately R 10000 per tree (total of R 130 000). However, it must be noted that many of the trees exceed this diameter and therefore cannot be successfully translocated without significant risk to the individual tree. Apart from the high cost of the translocation, the estimated survival rate is only 60%, thus equating to a high potential mortality. In addition, suitable land must be located into which to relocate the tree species.

Furthermore, the transplantation of these individual trees can cause additional ecological issues that are highly counterproductive to the preservation of the overall habitat. The heavy earth moving equipment required to transplant the individual trees will cause extensive damage to the system through soil compaction, indiscriminate vegetation removal and road creation.

In summary, the relocation is not considered to be a viable option due to the low survival rate of the tree species. The only other alternative solution is to plant young seedlings to replace the trees removed. This option is recommended as the expected survival rate is much higher (80%) if sufficient aftercare such as watering is implemented. However, and it must be noted that discretion may be used in the re planting process and should only equate to the number of trees actually lost. Offset numbers should in actuality be much lower than this projected value. The location of seedling generation is under the auspices of the assigned contractor. If this option is not considered to be feasible, on-site mitigations as defined by the ecological results and mitigations must be followed.

Ultimately, avoidance of removal of any protected species should be seen as the most preferable mitigation measure, alternatively a destruction permit should be applied for.

5. CONCLUSION AND PROFESSIONAL OPINION

Based on the field, desktop and literature studies, the proposed future development activities are largely viewed as a positive advancement within the study area as long as mitigation measures are followed).

The following GENERAL recommendations should be implemented before any further development takes place;

- 1 An EMPr consultant should be appointed for a pre-construction and post-construction inspection audit, incorporating all mitigation and recommendations as outlined in all of the specialist investigations conducted to date for the property area
- 2 Development should incorporate and adhere to principles as outlined in The South African Guidelines for Sustainable Drainage Systems (Armitage, Vice, Fisher-Jeffes, Winter, Spiegel, & Dunstan, 2013)
- 3 All protected trees should be integrated into the project design and protected from animals through adequate fencing and sequestration (inspected by an Ecologist or ECO).

From a minimum standard and methodological perspective, the survey effort was sufficient to produce a reasonably representative set of data from which to formulate the professional opinion, albeit in the absence of long-term monitoring data. The study area is located in a region dominated by natural to semi natural, albeit somewhat disturbed habitats, including an abundance of tall roosts. No obvious drainage lines were present.

In summary, the specialist can see no reason why the intended facility cannot proceed in accordance with the aforementioned recommendations and legislation.

6. REFERENCES

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7. APPENDICES

Appendix 1: Expected and observed avifauna species within the study area.

	Common Name	Scientific Name	IUCN Status (Regional)	Probability of Occurrence	Woodland	Grassland Shrubland
1	Abdim's Stork	<i>Ciconia abdimii</i>	NT	Medium		
2	Acacia Pied Barbet	<i>Tricholaema leucomelas</i>	LC	Confirmed	x	
3	African Black Duck	<i>Anas sparsa</i>	LC	Confirmed		
4	African Black Swift	<i>Apus barbatus</i>	LC	Low		

5	African Crane	<i>Crecoptis egregia</i>	LC	Low		
6	African Cuckoo	<i>Cuculus gularis</i>	LC	Low		
7	African Cuckoo-Hawk	<i>Aviceda cuculoides</i>	LC	Low		
8	African Darter	<i>Anhinga rufa</i>	LC	Confirmed		
9	African Firefinch	<i>Lagonosticta rubricata</i>	LC	Confirmed		
10	African Fish Eagle	<i>Haliaeetus vocifer</i>	LC	Confirmed		
11	African Goshawk	<i>Accipiter tachiro</i>	LC	Medium		
12	African Green Pigeon	<i>Treron calvus</i>	LC	Low		
13	African Grey Hornbill	<i>Lophoceros nasutus</i>	LC	Confirmed	x	
14	African Harrier-Hawk	<i>Polyboroides typus</i>	LC	Confirmed	x	
15	African Hawk-eagle	<i>Aquila spilogaster</i>	LC	Medium		
16	African Hoopoe	<i>Upupa africana</i>	LC	Confirmed		x
17	African Jacana	<i>Actophilornis africanus</i>	LC	Confirmed		
18	African Marsh Harrier	<i>Circus ranivorus</i>	EN	Low		
19	African Olive Pigeon	<i>Columba arquatrix</i>	LC	Low		
20	African Palm Swift	<i>Cypsiurus parvus</i>	LC	Confirmed		
21	African Paradise Flycatcher	<i>Terpsiphone viridis</i>	LC	Medium		
22	African Pied Wagtail	<i>Motacilla aguimp</i>	LC	Medium		
23	African Pipit	<i>Anthus cinnamomeus</i>	LC	Medium		
24	African Pygmy Goose	<i>Nettapus auritus</i>	LC	Low		
25	African Pygmy Kingfisher	<i>Ispidina picta</i>	LC	Low		
26	African Rail	<i>Rallus caerulescens</i>	LC	Medium		
27	African Reed Warbler	<i>Acrocephalus baeticatus</i>	LC	Confirmed		
28	African Sacred Ibis	<i>Threskiornis aethiopicus</i>	LC	Confirmed		
29	African Scops Owl	<i>Otus senegalensis</i>	LC	Confirmed		
30	African Snipe	<i>Gallinago nigripennis</i>	LC	Confirmed		
31	African Spoonbill	<i>Platalea alba</i>	LC	Medium		
32	African Stonechat	<i>Saxicola torquatus</i>	LC	High		
33	African Swamphen	<i>Porphyrio madagascariensis</i>	LC	Confirmed		
34	African Wattled Lapwing	<i>Vanellus senegallus</i>	LC	Confirmed		x
35	Alpine Swift	<i>Tachymarptis melba</i>	LC	Low		
36	Amethyst Sunbird	<i>Chalcomitra amethystina</i>	LC	Confirmed	x	
37	Amur Falcon	<i>Falco amurensis</i>	LC	Medium		
38	Ant-eating Chat	<i>Myrmecocichla formicivora</i>	LC	Medium		
39	Arrow-marked Babbler	<i>Turdoides jardineii</i>	LC	Confirmed		
40	Ashy Flycatcher	<i>Muscicapa caerulescens</i>	LC	Low		
41	Ashy Tit	<i>Melaniparus cinerascens</i>	LC	Medium		
42	Banded Martin	<i>Riparia cincta</i>	LC	Low		
43	Barn Swallow	<i>Hirundo rustica</i>	LC	Confirmed		

44	Barred Wren-Warbler	<i>Calamonastes fasciolatus</i>	LC	Medium		
45	Bar-throated Apalis	<i>Apalis thoracica</i>	LC	Medium		
46	Bearded Woodpecker	<i>Chloropicus namaquus</i>	LC	Confirmed	x	
47	Bennett's Woodpecker	<i>Campethera bennettii</i>	LC	Low		
48	Black Crane	<i>Zapornia flavirostra</i>	LC	Confirmed		
49	Black Cuckoo	<i>Cuculus clamosus</i>	LC	Medium		
50	Black Cuckooshrike	<i>Campephaga flava</i>	LC	Medium		
51	Black Heron	<i>Egretta ardesiaca</i>	LC	Medium		
52	Black Kite	<i>Milvus migrans</i>	LC	Low		
53	Black Sparrowhawk	<i>Accipiter melanoleucus</i>	LC	Medium		
54	Black Stork	<i>Ciconia nigra</i>	VU	Low		
55	Black-backed Puffback	<i>Dryoscopus cubla</i>	LC	Confirmed	x	
56	Black-chested Prinia	<i>Prinia flavicans</i>	LC	Confirmed		
57	Black-chested Snake Eagle	<i>Circaetus pectoralis</i>	LC	Medium		
58	Black-collared Barbet	<i>Lybius torquatus</i>	LC	Confirmed	x	
59	Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	LC	Medium		
60	Black-crowned Tchagra	<i>Tchagra senegalus</i>	LC	Medium		
61	Black-faced Waxbill	<i>Brunhilda erythronotos</i>	LC	Medium		
62	Black-headed Heron	<i>Ardea melanocephala</i>	LC	Confirmed		
63	Black-headed Oriole	<i>Oriolus larvatus</i>	LC	Confirmed	x	
64	Blacksmith Lapwing	<i>Vanellus armatus</i>	LC	Confirmed		x
65	Black-throated Canary	<i>Crithagra atrogularis</i>	LC	Confirmed		
66	Black-winged Kite	<i>Elanus caeruleus</i>	LC	Confirmed		x
67	Black-winged Pratincole	<i>Glareola nordmanni</i>	LC	Low		
68	Black-winged Stilt	<i>Himantopus himantopus</i>	LC	Confirmed		
69	Blue Waxbill	<i>Uraeginthus angolensis</i>	LC	Confirmed	x	
70	Blue-billed Teal	<i>Spatula hottentota</i>	LC	Low		
71	Blue-cheeked Bee-eater	<i>Merops persicus</i>	LC	Low		
72	Bronze Mannikin	<i>Spermestes cucullata</i>	LC	Confirmed		x
73	Brown Snake Eagle	<i>Circaetus cinereus</i>	LC	Medium		
74	Brown-backed Honeybird	<i>Prodotiscus regulus</i>	LC	Low		
75	Brown-crowned Tchagra	<i>Tchagra australis</i>	LC	Confirmed	x	
76	Brown-hooded Kingfisher	<i>Halcyon albiventris</i>	LC	Medium		
77	Brown-throated Martin	<i>Riparia paludicola</i>	LC	Medium		
78	Brubru	<i>Nilaus afer</i>	LC	Medium		
79	Buffy Pipit	<i>Anthus vaalensis</i>	LC	Low		
80	Burchell's Coucal	<i>Centropus burchellii</i>	LC	Confirmed		
81	Burchell's Starling	<i>Lamprotornis australis</i>	LC	Confirmed	x	
82	Burnt-necked Eremomela	<i>Eremomela usticollis</i>	LC	Medium		

83	Bushveld Pipit	<i>Anthus caffer</i>	LC	Medium		
84	Cape Longclaw	<i>Macronyx capensis</i>	LC	Confirmed		x
85	Cape Penduline Tit	<i>Anthoscopus minutus</i>	LC	Low		
86	Cape Robin-Chat	<i>Cossypha caffra</i>	LC	High		
87	Cape Shoveler	<i>Spatula smithii</i>	LC	Confirmed		
88	Cape Sparrow	<i>Passer melanurus</i>	LC	Confirmed	x	x
89	Cape Starling	<i>Lamprotomis nitens</i>	LC	Confirmed	x	
90	Cape Teal	<i>Anas capensis</i>	LC	Confirmed		
91	Cape Turtle Dove	<i>Streptopelia capicola</i>	LC	Confirmed	x	x
92	Cape Vulture	<i>Gyps coprotheres</i>	EN	Medium		
93	Cape Wagtail	<i>Motacilla capensis</i>	LC	Confirmed		
94	Cape Weaver	<i>Ploceus capensis</i>	LC	Low		
95	Cape White-eye	<i>Zosterops virens</i>	LC	High		
96	Capped Wheatear	<i>Oenanthe pileata</i>	LC	Medium		
97	Cardinal Woodpecker	<i>Dendropicus fuscescens</i>	LC	Confirmed		
98	Chestnut-backed Sparrow-Lark	<i>Eremopterix leucotis</i>	LC	Medium		
99	Chestnut-vented Warbler	<i>Curruca subcoerulea</i>	LC	Confirmed		
100	Chin-spot Batis	<i>Batis molitor</i>	LC	High		
101	Cinnamon-breasted Bunting	<i>Emberiza tahapisi</i>	LC	Medium		
102	Cloud Cisticola	<i>Cisticola textrix</i>	LC	Low		
103	Common Buttonquail	<i>Tumix sylvaticus</i>	LC	Medium		
104	Common Buzzard	<i>Buteo buteo</i>	LC	Medium		
105	Common Greenshank	<i>Tringa nebularia</i>	LC	Medium		
106	Common House Martin	<i>Delichon urbicum</i>	LC	Low		
107	Common Moorhen	<i>Gallinula chloropus</i>	LC	Confirmed		
108	Common Myna	<i>Acridotheres tristis</i>	LC	Confirmed		x
109	Common Ostrich	<i>Struthio camelus</i>	LC	Low		
110	Common Quail	<i>Coturnix coturnix</i>	LC	Low		
111	Common Sandpiper	<i>Actitis hypoleucos</i>	LC	Medium		
112	Common Scimitarbill	<i>Rhinopomastus cyanomelas</i>	LC	Confirmed		
113	Common Waxbill	<i>Estrilda astrild</i>	LC	Confirmed		x
114	Coqui Francolin	<i>Peliperdix coqui</i>	LC	Medium		
115	Crested Barbet	<i>Trachyphonus vaillantii</i>	LC	High		
116	Crested Francolin	<i>Dendroperdix sephaena</i>	LC	Confirmed	x	x
117	Crimson-breasted Shrike	<i>Laniarius atrococcineus</i>	LC	Medium		
118	Crowned Lapwing	<i>Vanellus coronatus</i>	LC	Confirmed		x
119	Cut-throat Finch	<i>Amadina fasciata</i>	LC	Medium		
120	Dark-capped Bulbul	<i>Pycnonotus tricolor</i>	LC	Confirmed	x	x
121	Desert Cisticola	<i>Cisticola aridulus</i>	LC	Medium		

122	Diederik Cuckoo	<i>Chrysococcyx caprius</i>	LC	Confirmed	x	
123	Double-banded Sandgrouse	<i>Pterocles bicinctus</i>	LC	Low		
124	Dusky Indigobird	<i>Vidua funerea</i>	LC	Confirmed		
125	Dwarf Bittern	<i>Ixobrychus sturmii</i>	LC	Confirmed		
126	Egyptian Goose	<i>Alopochen aegyptiaca</i>	LC	Confirmed		
127	Emerald-spotted Wood Dove	<i>Turtur chalcospilos</i>	LC	Medium		
128	Eurasian Hobby	<i>Falco subbuteo</i>	LC	Low		
129	European Bee-eater	<i>Merops apiaster</i>	LC	Medium		
130	European Roller	<i>Coracias garrulus</i>	NT	High		
131	Familiar Chat	<i>Oenanthe familiaris</i>	LC	Medium		
132	Fawn-colored Lark	<i>Calendulauda africanoides</i>	LC	Low		
133	Fiery-necked Nightjar	<i>Caprimulgus pectoralis</i>	LC	Medium		
134	Fiscal Flycatcher	<i>Melaenomis silens</i>	LC	Confirmed		x
135	Flappet Lark	<i>Mirafra rufocinnamomea</i>	LC	Low		
136	Fork-tailed Drongo	<i>Dicrurus adsimilis</i>	LC	Confirmed	x	x
137	Freckled Nightjar	<i>Caprimulgus tristigma</i>	LC	Confirmed		
138	Fulvous Whistling Duck	<i>Dendrocygna bicolor</i>	LC	Low		
139	Gabar Goshawk	<i>Micronisus gabar</i>	LC	Medium		
140	Garden Warbler	<i>Sylvia borin</i>	LC	Low		
141	Giant Kingfisher	<i>Megaceryle maxima</i>	LC	Confirmed		
142	Glossy Ibis	<i>Plegadis falcinellus</i>	LC	Confirmed		x
143	Golden-breasted Bunting	<i>Emberiza flaviventris</i>	LC	Medium		
144	Golden-tailed Woodpecker	<i>Campethera abingoni</i>	LC	Medium		
145	Goliath Heron	<i>Ardea goliath</i>	LC	Medium		
146	Great Crested Grebe	<i>Podiceps cristatus</i>	LC	Low		
147	Great Egret	<i>Ardea alba</i>	LC	Confirmed		x
148	Great Reed Warbler	<i>Acrocephalus arundinaceus</i>	LC	Low		
149	Great Sparrow	<i>Passer motitensis</i>	LC	Medium		
150	Greater Double-collared Sunbird	<i>Cinnyris afer</i>	LC	Confirmed	x	
151	Greater Flamingo	<i>Phoenicopterus roseus</i>	NT	Low		
152	Greater Honeyguide	<i>Indicator indicator</i>	LC	Confirmed		
153	Greater Kestrel	<i>Falco rupicoloides</i>	LC	Medium		
154	Greater Painted-snipe	<i>Rostratula benghalensis</i>	NT	High		
155	Greater Striped Swallow	<i>Cecropis cucullata</i>	LC	Medium		
156	Green Wood Hoopoe	<i>Phoeniculus purpureus</i>	LC	Confirmed		
157	Green-capped Eremomela	<i>Eremomela scotops</i>	LC	Low		
158	Green-winged Pytilia	<i>Pytilia melba</i>	LC	Confirmed		
159	Grey Go-away-bird	<i>Crinifer concolor</i>	LC	Confirmed	x	x

160	Grey Heron	<i>Ardea cinerea</i>	LC	Confirmed		
161	Grey Penduline Tit	<i>Anthoscopus caroli</i>	LC	Low		
162	Grey Tit-Flycatcher	<i>Myioparus plumbeus</i>	LC	Low		
163	Grey-backed Camaroptera	<i>Camaroptera brevicaudata</i>	LC	Confirmed		
164	Grey-headed Bushshrike	<i>Malaconotus blanchoti</i>	LC	Confirmed		
165	Grey-headed Gull	<i>Chroicocephalus cirrocephalus</i>	LC	Low		
166	Grey-headed Kingfisher	<i>Halcyon leucocephala</i>	LC	Low		
167	Groundscraper Thrush	<i>Turdus litsitsirupa</i>	LC	Confirmed		x
168	Hadada Ibis	<i>Bostrychia hagedash</i>	LC	Confirmed		x
169	Hamerkop	<i>Scopus umbretta</i>	LC	Confirmed		
170	Harlequin Quail	<i>Coturnix delegorguei</i>	LC	Low		
171	Helmeted Guineafowl	<i>Numida meleagris</i>	LC	Confirmed		x
172	Horus Swift	<i>Apus horus</i>	LC	Low		
173	House Sparrow	<i>Passer domesticus</i>	LC	Confirmed	x	x
174	Icterine Warbler	<i>Hippolais icterina</i>	LC	Low		
175	Intermediate Egret	<i>Ardea intermedia</i>	LC	Medium		
176	Jackal Buzzard	<i>Buteo rufofuscus</i>	LC	Medium		
177	Jacobin Cuckoo	<i>Clamator jacobinus</i>	LC	Medium		
178	Jameson's Firefinch	<i>Lagonosticta rhodopareia</i>	LC	Medium		
179	Kalahari Scrub Robin	<i>Cercotrichas paena</i>	LC	Medium		
180	Karoo Thrush	<i>Turdus smithi</i>	LC	Confirmed		x
181	Kittlitz's Plover	<i>Charadrius pecuarius</i>	LC	Medium		
182	Klaas's Cuckoo	<i>Chrysococcyx klaas</i>	LC	Medium		
183	Knob-billed Duck	<i>Sarkidiornis melanotos</i>	LC	Confirmed		
184	Kurrichane Thrush	<i>Turdus libonyana</i>	LC	High		
185	Lanner Falcon	<i>Falco biarmicus</i>	VU	High		
186	Laughing Dove	<i>Spilopelia senegalensis</i>	LC	Confirmed	x	x
187	Lazy Cisticola	<i>Cisticola aberrans</i>	LC	Medium		
188	Lesser Grey Shrike	<i>Lanius minor</i>	LC	Medium		
189	Lesser Honeyguide	<i>Indicator minor</i>	LC	Low		
190	Lesser Kestrel	<i>Falco naumanni</i>	LC	Low		
191	Lesser Masked-weaver	<i>Ploceus intermedius</i>	LC	Medium		
192	Lesser Striped Swallow	<i>Cecropis abyssinica</i>	LC	Confirmed		
193	Lesser Swamp Warbler	<i>Acrocephalus gracilirostris</i>	LC	Medium		
194	Levaillant's Cisticola	<i>Cisticola tinniens</i>	LC	Medium		
195	Levaillant's Cuckoo	<i>Clamator levaillantii</i>	LC	Medium		
196	Lilac-breasted Roller	<i>Coracias caudatus</i>	LC	Confirmed	x	
197	Little Bee-eater	<i>Merops pusillus</i>	LC	Confirmed		
198	Little Bittern	<i>Ixobrychus minutus</i>	LC	Low		

199	Little Egret	<i>Egretta garzetta</i>	LC	Confirmed		x
200	Little Grebe	<i>Tachybaptus ruficollis</i>	LC	Medium		
201	Little Rush Warbler	<i>Bradypterus baboecala</i>	LC	Medium		
202	Little Sparrowhawk	<i>Accipiter minullus</i>	LC	Medium		
203	Little Stint	<i>Calidris minuta</i>	LC	Low		
204	Little Swift	<i>Apus affinis</i>	LC	Confirmed		
205	Lizard Buzzard	<i>Kaupifalco monogrammicus</i>	LC	Medium		
206	Long-billed Crombec	<i>Sylvietta rufescens</i>	LC	Confirmed	x	
207	Long-crested Eagle	<i>Lophaelus occipitalis</i>	LC	Low		
208	Long-tailed Paradise Whydah	<i>Vidua paradisaea</i>	LC	Confirmed	x	
209	Long-tailed Widowbird	<i>Euplectes progne</i>	LC	Confirmed		
210	Maccoa Duck	<i>Oxyura maccoa</i>	NT	Low		
211	Magpie Shrike	<i>Urolestes melanoleucus</i>	LC	Confirmed		
212	Malachite Kingfisher	<i>Corythornis cristatus</i>	LC	Confirmed		
213	Malachite Sunbird	<i>Nectarinia famosa</i>	LC	Low		
214	Mallard	<i>Anas platyrhynchos</i>	LC	Low		
215	Marabou Stork	<i>Leptoptilos crumenifer</i>	NT	Medium		
216	Marico Flycatcher	<i>Melaenomis mariquensis</i>	LC	Medium		
217	Marico Sunbird	<i>Cinnyris mariquensis</i>	LC	Medium		
218	Marsh Owl	<i>Asio capensis</i>	LC	Medium		
219	Marsh Sandpiper	<i>Tringa stagnatilis</i>	LC	Low		
220	Marsh Warbler	<i>Acrocephalus palustris</i>	LC	Confirmed		
221	Martial Eagle	<i>Polemaetus bellicosus</i>	EN	Low		
222	Meyer's Parrot	<i>Poicephalus meyeri</i>	LC	Low		
223	Mocking Cliff Chat	<i>Thamnolaea cinnamomeiventris</i>	LC	Medium		
224	Monotonous Lark	<i>Mirafrapa passerina</i>	LC	Low		
225	Mountain Wagtail	<i>Motacilla clara</i>	LC	Low		
226	Namaqua Dove	<i>Oena capensis</i>	LC	Confirmed		x
227	Natal Spurfowl	<i>Pternistis natalensis</i>	LC	Confirmed		x
228	Neddicky	<i>Cisticola fulvicapilla</i>	LC	Medium		
229	Nicholson's Pipit	<i>Anthus nicholsoni</i>	LC	Low		
230	Northern Black Korhaan	<i>Afrotis afroides</i>	LC	Medium		
231	Olive-tree Warbler	<i>Hippolais olivetorum</i>	LC	Low		
232	Orange-breasted Bushshrike	<i>Chlorophoneus sulfureopectus</i>	LC	Medium		
233	Orange-breasted Waxbill	<i>Amandava subflava</i>	LC	Medium		
234	Pale Flycatcher	<i>Melaenomis pallidus</i>	LC	Medium		
235	Pearl-breasted Swallow	<i>Hirundo dimidiata</i>	LC	Medium		
236	Pearl-spotted Owlet	<i>Glaucidium perlatum</i>	LC	Confirmed		
237	Pied Avocet	<i>Recurvirostra avosetta</i>	LC	Low		

238	Pied Crow	<i>Corvus albus</i>	LC	High		
239	Pied Kingfisher	<i>Ceryle rudis</i>	LC	Confirmed	x	x
240	Pin-tailed Whydah	<i>Vidua macroura</i>	LC	Medium		
241	Plain-backed Pipit	<i>Anthus leucophrys</i>	LC	Low		
242	Purple Heron	<i>Ardea purpurea</i>	LC	Medium		
243	Purple Indigobird	<i>Vidua purpurascens</i>	LC	Confirmed		
244	Purple Roller	<i>Coracias naevius</i>	LC	Medium		
245	Purple-crested Turaco	<i>Gallirex porphyreolophus</i>	LC	Low		
246	Quailfinch	<i>Ortygospiza atricollis</i>	LC	Medium		
247	Rattling Cisticola	<i>Cisticola chiniana</i>	LC	Confirmed		x
248	Red-backed Shrike	<i>Lanius collurio</i>	LC	Medium		
249	Red-billed Buffalo Weaver	<i>Bubalomis niger</i>	LC	Low		
250	Red-billed Firefinch	<i>Lagonosticta senegala</i>	LC	Medium		
251	Red-billed Oxpecker	<i>Buphagus erythrorhynchus</i>	LC	Low		
252	Red-billed Quelea	<i>Quelea quelea</i>	LC	Confirmed		x
253	Red-billed Teal	<i>Anas erythrorhyncha</i>	LC	Medium		
254	Red-breasted Swallow	<i>Cecropis semirufa</i>	LC	Medium		
255	Red-capped Lark	<i>Calandrella cinerea</i>	LC	Medium		
256	Red-chested Cuckoo	<i>Cuculus solitarius</i>	LC	Medium		
257	Red-collared Widowbird	<i>Euplectes ardens</i>	LC	Confirmed		
258	Red-crested Korhaan	<i>Lophotis ruficrista</i>	LC	Medium		
259	Red-eyed Dove	<i>Streptopelia semitorquata</i>	LC	Confirmed		x
260	Red-faced Mousebird	<i>Urocolius indicus</i>	LC	Confirmed	x	x
261	Red-headed Finch	<i>Amadina erythrocephala</i>	LC	Low		
262	Red-headed Weaver	<i>Anaplectes rubriceps</i>	LC	Low		
263	Red-knobbed Coot	<i>Fulica cristata</i>	LC	Confirmed		
264	Red-throated Wryneck	<i>Jynx ruficollis</i>	LC	Low		
265	Red-winged Starling	<i>Onychognathus morio</i>	LC	Medium		
266	Reed Cormorant	<i>Microcarbo africanus</i>	LC	Confirmed		
267	Rock Dove	<i>Columba livia</i>	LC	Confirmed		
268	Rock Kestrel	<i>Falco rupicolus</i>	LC	Low		
269	Rock Martin	<i>Ptyonoprogne fuligula</i>	LC	Medium		
270	Ruff	<i>Calidris pugnax</i>	LC	Low		
271	Rufous-cheeked Nightjar	<i>Caprimulgus rufigena</i>	LC	Low		
272	Rufous-naped Lark	<i>Mirafrica africana</i>	LC	Medium		
273	Sabota Lark	<i>Calendulauda sabota</i>	LC	Medium		
274	Saddle-billed Stork	<i>Ephippiorhynchus senegalensis</i>	EN	Low		
275	Scaly-feathered Weaver	<i>Sporopipes squamifrons</i>	LC	High		
276	Scarlet-chested Sunbird	<i>Chalcomitra senegalensis</i>	LC	Medium		

277	Secretarybird	<i>Sagittarius serpentarius</i>	VU	Confirmed		x
278	Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	LC	Low		
279	Shaft-tailed Whydah	<i>Vidua regia</i>	LC	Medium		
280	Shelley's Francolin	<i>Scleroptila shelleyi</i>	LC	Medium		
281	Shikra	<i>Accipiter badius</i>	LC	Low		
282	Sombre Greenbul	<i>Andropadus importunus</i>	LC	Medium		
283	Southern Black Flycatcher	<i>Melaenomis pammelaina</i>	LC	Medium		
284	Southern Black Tit	<i>Melaniparus niger</i>	LC	Medium		
285	Southern Boubou	<i>Laniarius ferrugineus</i>	LC	Confirmed		
286	Southern Fiscal	<i>Lanius collaris</i>	LC	Confirmed		x
287	Southern Grey-headed Sparrow	<i>Passer diffusus</i>	LC	High		
288	Southern Masked Weaver	<i>Ploceus velatus</i>	LC	Confirmed		
289	Southern Pied Babbler	<i>Turdoides bicolor</i>	LC	Confirmed		
290	Southern Pochard	<i>Netta erythrophthalma</i>	LC	Low		
291	Southern Red Bishop	<i>Euplectes orix</i>	LC	Confirmed		
292	Southern Red-billed Hornbill	<i>Tockus rufirostris</i>	LC	Medium		
293	Southern White-crowned Shrike	<i>Eurocephalus anguimans</i>	LC	Confirmed	x	
294	Southern White-faced Owl	<i>Ptilopsis granti</i>	LC	Medium		
295	Southern Yellow-billed Hornbill	<i>Tockus leucomelas</i>	LC	Confirmed		
296	Speckled Mousebird	<i>Colius striatus</i>	LC	High		
297	Speckled Pigeon	<i>Columba guinea</i>	LC	High		
298	Spectacled Weaver	<i>Ploceus ocularis</i>	LC	Medium		
299	Spotted Eagle-Owl	<i>Bubo africanus</i>	LC	Confirmed		
300	Spotted Flycatcher	<i>Muscicapa striata</i>	LC	Medium		
301	Spotted Thick-knee	<i>Burhinus capensis</i>	LC	Confirmed		x
302	Spur-winged Goose	<i>Plectropterus gambensis</i>	LC	Confirmed		
303	Squacco Heron	<i>Ardeola ralloides</i>	LC	Medium		
304	Steppe Eagle	<i>Aquila nipalensis</i>	LC	Low		
305	Streaky-headed Seedeater	<i>Crithagra gularis</i>	LC	Medium		
306	Striated Heron	<i>Butorides striata</i>	LC	Medium		
307	Striped Kingfisher	<i>Halcyon chelicuti</i>	LC	Medium		
308	Striped Pipit	<i>Anthus lineiventris</i>	LC	Low		
309	Swainson's Spurfowl	<i>Pternistis swainsonii</i>	LC	Confirmed	x	x
310	Sweet Waxbill	<i>Coccygia melanotis</i>	LC	Low		
311	Tawny Eagle	<i>Aquila rapax</i>	EN	Medium		
312	Tawny-flanked Prinia	<i>Prinia subflava</i>	LC	Confirmed		
313	Temminck's Courser	<i>Cursorius temminckii</i>	LC	Confirmed		x
314	Terrestrial Brownbul	<i>Phyllastrephus terrestris</i>	LC	Medium		
315	Thick-billed Weaver	<i>Amblyospiza albifrons</i>	LC	Confirmed		

316	Three-banded Plover	<i>Charadrius tricollaris</i>	LC	Confirmed		
317	Tinkling Cisticola	<i>Cisticola rufilatus</i>	LC	Low		
318	Verreaux's Eagle	<i>Aquila verreauxii</i>	VU	Low		
319	Verreaux's Eagle-Owl	<i>Bubo lacteus</i>	LC	Confirmed		x
320	Village Indigobird	<i>Vidua chalybeata</i>	LC	Confirmed		x
321	Village Weaver	<i>Ploceus cucullatus</i>	LC	Confirmed		
322	Violet-backed Starling	<i>Cinnyricinclus leucogaster</i>	LC	Medium		
323	Violet-eared Waxbill	<i>Granatina granatina</i>	LC	Confirmed	x	
324	Wahlberg's Eagle	<i>Hieraaetus wahlbergi</i>	LC	Medium		
325	Wattled Starling	<i>Creatophora cinerea</i>	LC	Medium		
326	Western Barn Owl	<i>Tyto alba</i>	LC	Confirmed		x
327	Western Cattle Egret	<i>Bubulcus ibis</i>	LC	Confirmed		x
328	Western Osprey	<i>Pandion haliaetus</i>	LC	Low		
329	Western Yellow Wagtail	<i>Motacilla flava</i>	LC	Low		
330	Whiskered Tern	<i>Chlidonias hybrida</i>	LC	Low		
331	White Stork	<i>Ciconia ciconia</i>	LC	Medium		
332	White-backed Duck	<i>Thalassornis leuconotus</i>	LC	Low		
333	White-backed Vulture	<i>Gyps africanus</i>	CR	Low		
334	White-bellied Sunbird	<i>Cinnyris talatala</i>	LC	Confirmed		
335	White-breasted Cormorant	<i>Phalacrocorax lucidus</i>	LC	Confirmed		
336	White-browed Scrub Robin	<i>Cercotrichas leucophrys</i>	LC	Confirmed		
337	White-browed Sparrow-Weaver	<i>Plocepasser mahali</i>	LC	High		
338	White-crested Helmetshrike	<i>Prionops plumatus</i>	LC	Confirmed		
339	White-faced Whistling Duck	<i>Dendrocygna viduata</i>	LC	Medium		
340	White-fronted Bee-eater	<i>Merops bullockoides</i>	LC	Confirmed		
341	White-rumped Swift	<i>Apus caffer</i>	LC	Medium		
342	White-throated Robin-Chat	<i>Cossypha humeralis</i>	LC	Medium		
343	White-throated Swallow	<i>Hirundo albicularis</i>	LC	Medium		
344	White-winged Tern	<i>Chlidonias leucopterus</i>	LC	Low		
345	White-winged Widowbird	<i>Euplectes albonotatus</i>	LC	Confirmed		
346	Willow Warbler	<i>Phylloscopus trochilus</i>	LC	Medium		
347	Wood Sandpiper	<i>Tringa glareola</i>	LC	Medium		
348	Woodland Kingfisher	<i>Halcyon senegalensis</i>	LC	Confirmed	x	x
349	Yellow Canary	<i>Crithagra flaviventris</i>	LC	Low		
350	Yellow-bellied Eremomela	<i>Eremomela icteropygialis</i>	LC	Medium		
351	Yellow-bellied Greenbul	<i>Chlorocichla flaviventris</i>	LC	Low		
352	Yellow-billed Duck	<i>Anas undulata</i>	LC	Confirmed		
353	Yellow-billed Kite	<i>Milvus aegyptius</i>	LC	Medium		
354	Yellow-billed Stork	<i>Mycteria ibis</i>	EN	Low		

355	Yellow-breasted Apalis	<i>Apalis flavida</i>	LC	Medium		
356	Yellow-crowned Bishop	<i>Euplectes afer</i>	LC	Medium		
357	Yellow-fronted Canary	<i>Crithagra mozambica</i>	LC	Confirmed		
358	Yellow-fronted Tinkerbird	<i>Pogoniulus chrysoconus</i>	LC	High		
359	Yellow-throated Bush Sparrow	<i>Gymnoris superciliaris</i>	LC	Medium		
360	Zitting Cisticola	<i>Cisticola juncidis</i>	LC	Confirmed	x	x

Appendix 2: Specialist SACNASP accreditation

