



SCIENTIFIC TERRESTRIAL SERVICES

## Terrestrial Biodiversity Assessment

AS PART OF THE ENVIRONMENTAL  
AUTHORISATION PROCESS FOR THE  
PROPOSED VORNA VALLEY SPARK  
SCHOOL, GAUTENG PROVINCE.

### Part B: Terrestrial Biodiversity Specialist Assessment Report and Plant Species Compliance Statement

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## DOCUMENT GUIDE

The table below provides a guide to reporting biodiversity impacts as they relate to Government Notice 1150 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Plant Species, as published in Government Gazette 43855 dated 30 October 2020 (as amended in Government Notice 3717 of 2023).

| Theme-Specific Requirements as per Government Notice No. 1150<br>Plant Theme – Low Sensitivity Protocol followed |                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                    |
|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| No.                                                                                                              | SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS                                                                                                                                                                                                                                                                                                                             | Section in report/Notes                                                                            |
| <b>1.</b>                                                                                                        | <b>General Information</b>                                                                                                                                                                                                                                                                                                                                                                |                                                                                                    |
| 1.1                                                                                                              | An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified by the screening tool as being of “medium sensitivity” for plant species, must submit either a Plant Species Specialist Assessment Report or a Plant Species Compliance Statement, depending on the outcome of a site inspection undertaken in accordance with paragraph 4 | <b>Part B:</b> Section 5 - A Plant Species Compliance Statement is compiled within this report.    |
| 1.2                                                                                                              | An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified by the screening tool as being of “low” sensitivity for plant species, must submit a Plant Species Compliance Statement.                                                                                                                                                   | <b>Part B:</b> Section 5 - A Plant Species Compliance Statement is compiled within this report.    |
| 1.3                                                                                                              | Where the nature of the activity is expected to have an impact on species of conservation concern beyond boundary of the preferred site, the project areas of influence must be determined by the specialist in accordance with Species Environmental Assessment Guideline, and the area of assessment must include the project areas of influence, as determined.                        | Not applicable to this study. A Plant Species Compliance Statement is compiled within this report. |
| <b>5</b>                                                                                                         | <b>Terrestrial Plant Species Compliance Statement</b>                                                                                                                                                                                                                                                                                                                                     |                                                                                                    |
| <b>5.1</b>                                                                                                       | <b>The compliance statement must be prepared by a SACNASP registered specialist under one of the two fields of practice (Botanical Science or Ecological Science).</b>                                                                                                                                                                                                                    | <b>Part A:</b> Appendix E<br><b>Parts A and B:</b> Cover page                                      |
| <b>5.2</b>                                                                                                       | <b>The compliance statement must:</b>                                                                                                                                                                                                                                                                                                                                                     |                                                                                                    |
| 5.2.1                                                                                                            | Be applicable within the study area;                                                                                                                                                                                                                                                                                                                                                      | <b>Part B:</b> Sections 1 & 2                                                                      |
| 5.2.2                                                                                                            | Confirm that the study area is of “low” sensitivity for terrestrial plant species;                                                                                                                                                                                                                                                                                                        | <b>Part A:</b> Section 4 (site verification report)<br><b>Part B:</b> Section 5                    |
| 5.2.3                                                                                                            | Indicate whether or not the proposed development will have any impact on SCC.                                                                                                                                                                                                                                                                                                             | <b>Part B:</b> Section 5                                                                           |
| <b>5.3</b>                                                                                                       | <b>The compliance statement must contain, as a minimum, the following information:</b>                                                                                                                                                                                                                                                                                                    |                                                                                                    |
| 5.3.1                                                                                                            | Contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the compliance statement including a curriculum vitae;                                                                                                                                                                                                                     | <b>Part A:</b> Appendix E                                                                          |
| 5.3.2                                                                                                            | A signed statement of independence by the specialist;                                                                                                                                                                                                                                                                                                                                     | <b>Part A:</b> Appendix E                                                                          |
| 5.3.3                                                                                                            | A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;                                                                                                                                                                                                                                                     | <b>Part B:</b> Sections 1 & 2                                                                      |
| 5.3.4                                                                                                            | A description of the methodology used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant;                                                                                                                                                                                                                           | <b>Part A:</b> Appendix D<br><b>Part B:</b> Appendix A                                             |
| 5.3.5                                                                                                            | Where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion in the EMPr;                                                                                                                                                                                                                                                                 | <b>Part B:</b> Section 5                                                                           |
| 5.3.6                                                                                                            | A description of the assumptions made and any uncertainties or gaps in knowledge or data;                                                                                                                                                                                                                                                                                                 | <b>Part B:</b> Section 1                                                                           |
| 5.3.7                                                                                                            | The mean density of observations/ number of samples sites per unit area;                                                                                                                                                                                                                                                                                                                  | <b>Part B:</b> Section 2                                                                           |
| 5.3.8                                                                                                            | Any conditions to which the compliance statement is subjected.                                                                                                                                                                                                                                                                                                                            | <b>Part B:</b> Section 5                                                                           |
|                                                                                                                  | <b>A signed copy of the Terrestrial Plant Species Compliance Statement must be appended to the Basic Assessment Report or the Environmental Impact Assessment Report.</b>                                                                                                                                                                                                                 |                                                                                                    |



The table below provides a guide to the reporting of biodiversity impacts as they relate to Government Notice No. 320 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on **Terrestrial Biodiversity** as published in Government Gazette 43110 dated 20 June 2020.

| Theme-Specific Requirements as per Government Notice No. 320                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                     |
|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Terrestrial Biodiversity Theme – Very High Sensitivity Rating as per Screening Tool Output |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                     |
| No.                                                                                        | SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Section in report/Notes                                                                                             |
| <b>2</b>                                                                                   | <b>Terrestrial Biodiversity Specialist Assessment</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                     |
| 2.1                                                                                        | The assessment must be prepared by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with expertise in the field of terrestrial biodiversity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Part A – C:</b> Cover Page<br><b>Part A:</b> Appendix E                                                          |
| 2.2                                                                                        | The assessment must be undertaken on the preferred site and within the proposed development footprint.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Part A:</b> Section 1                                                                                            |
| <b>2.3</b>                                                                                 | <b>The assessment must provide a baseline description of the site which includes, as a minimum, the following aspects:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                     |
| 2.3.1                                                                                      | A description of the ecological drivers or processes of the system and how the proposed development will impact these;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Part B:</b> Section 3 (flora)<br><b>Part C:</b> Section 3 (fauna)                                                |
| 2.3.2                                                                                      | Ecological functioning and ecological processes (e.g., fire, migration, pollination, etc.) that operate within the preferred site;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Part B:</b> Section 3 (flora)<br><b>Part C:</b> Section 3 (fauna)                                                |
| 2.3.3                                                                                      | The ecological corridors that the proposed development would impede including migration and movement of flora and fauna;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Part A:</b> Section 3 (desktop analysis)<br><b>Part B:</b> Section 3 (flora)<br><b>Part C:</b> Section 3 (fauna) |
| 2.3.4                                                                                      | The description of any significant terrestrial landscape features (including rare or important flora-faunal associations, presence of Strategic Water Source Areas (SWSAs) or Freshwater Ecosystem Priority Area (FEPA) sub catchments;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Part A:</b> Section 3 (desktop analysis)<br><br><b>None associated with the study area.</b>                      |
| 2.3.5                                                                                      | A description of terrestrial biodiversity and ecosystems on the preferred site, including:<br>a) main vegetation types;<br>b) threatened ecosystems, including listed ecosystems as well as locally important habitat types identified;<br>c) ecological connectivity, habitat fragmentation, ecological processes, and fine scale habitats; and<br>d) species, distribution, important habitats (e.g., feeding grounds, nesting sites, etc.) and movement patterns identified;                                                                                                                                                                                                                                                                                                                                                                            | <b>Part A:</b> Section 3 (desktop analysis)<br><b>Part B:</b> Section 3 (flora)<br><b>Part C:</b> Section 3 (fauna) |
| 2.3.6                                                                                      | The assessment must identify any alternative development footprints within the preferred site which would be of a “low” sensitivity as identified by the screening tool and verified through the site sensitivity verification; and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Part B:</b> Section 4 (flora)<br><b>Part C:</b> Section 4 (fauna)                                                |
| <b>2.3.7</b>                                                                               | <b>The assessment must be based on the results of a site inspection undertaken on the preferred site and must identify:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                     |
| 2.3.7.1                                                                                    | Terrestrial Critical Biodiversity Areas (CBAs), including:<br>a) <i>the reasons why an area has been identified as a CBA;</i><br>b) <i>an indication of whether or not the proposed development is consistent with maintaining the CBA in a natural or near natural state or in achieving the goal of rehabilitation;</i><br>c) <i>the impact on species composition and structure of vegetation with an indication of the extent of clearing activities in proportion to the remaining extent of the ecosystem type(s);</i><br>d) <i>the impact on ecosystem threat status;</i><br>e) <i>the impact on explicit subtypes in the vegetation;</i><br>f) <i>the impact on overall species and ecosystem diversity of the site; and</i><br>g) <i>the impact on any changes to threat status of populations of species of conservation concern in the CBA;</i> | <b>Part A:</b> Section 3 (desktop analysis)<br><b>Part B:</b> Section 3<br><b>Part C:</b> Section 3                 |
| 2.3.7.2                                                                                    | Terrestrial Ecological Support Areas (ESAs), including:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                     |



| Theme-Specific Requirements as per Government Notice No. 320                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                             |
|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Terrestrial Biodiversity Theme – Very High Sensitivity Rating as per Screening Tool Output |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                             |
| No.                                                                                        | SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                        | Section in report/Notes                                                                                                                     |
|                                                                                            | <ul style="list-style-type: none"> <li>a) <i>the impact on the ecological processes that operate within or across the site;</i></li> <li>b) <i>the extent the proposed development will impact on the functionality of the ESA; and</i></li> <li>c) <i>loss of ecological connectivity (on site, and in relation to the broader landscape) due to the degradation and severing of ecological corridors or introducing barriers that impede migration and movement of flora and fauna;</i></li> </ul> |                                                                                                                                             |
| 2.3.7.3                                                                                    | Protected areas as defined by the National Environmental Management: Protected Areas Act, 2004 including- <ul style="list-style-type: none"> <li>a) <i>an opinion on whether the proposed development aligns with the objectives or purpose of the protected area and the zoning as per the protected area management plan;</i></li> </ul>                                                                                                                                                           | <b>Part A:</b> Section 3 (desktop analysis).<br><b>Part B:</b> Section 3                                                                    |
| 2.3.7.4                                                                                    | Priority areas for protected area expansion, including- <ul style="list-style-type: none"> <li>a) <i>the way in which the proposed development will compromise or contribute to the expansion of the protected area network;</i></li> </ul>                                                                                                                                                                                                                                                          | <b>Part A:</b> Section 3 (desktop analysis).                                                                                                |
| 2.3.7.5                                                                                    | SWSAs including: <ul style="list-style-type: none"> <li>a) <i>the impact(s) on the terrestrial habitat of a SWSA; and</i></li> <li>b) <i>the impacts of the proposed development on the SWSA water quality and quantity (e.g. describing potential increased runoff leading to increased sediment load in water courses);</i></li> </ul>                                                                                                                                                             | <b>Part A:</b> Section 3 (desktop analysis).<br><br><b>None associated with the study area.</b>                                             |
| 2.3.7.6                                                                                    | FEPA sub catchments, including- <ul style="list-style-type: none"> <li>a) <i>the impacts of the proposed development on habitat condition and species in the FEPA sub catchment;</i></li> </ul>                                                                                                                                                                                                                                                                                                      | <b>None associated with the study area.</b>                                                                                                 |
| 2.3.7.7                                                                                    | Indigenous forests, including: <ul style="list-style-type: none"> <li>a) <i>impact on the ecological integrity of the forest; and</i></li> <li>b) <i>percentage of natural or near natural indigenous forest area lost and a statement on the implications in relation to the remaining areas.</i></li> </ul>                                                                                                                                                                                        | <b>None associated with the study area.</b>                                                                                                 |
| <b>2.4</b>                                                                                 | <b>The findings of the assessment must be written up in a Terrestrial Biodiversity Specialist Assessment Report.</b>                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                             |
|                                                                                            | <b>Part B:</b> Results of the <b>Floral Assessment</b> as well as conclusions on Terrestrial Biodiversity as it relates to floral communities.<br><b>Part C:</b> Results of the <b>Faunal Assessment</b> as well as conclusions on Terrestrial Biodiversity as it relates to faunal communities.                                                                                                                                                                                                     |                                                                                                                                             |
| <b>3</b>                                                                                   | <b>Terrestrial Biodiversity Specialist Assessment Report</b>                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                             |
| <b>3.1</b>                                                                                 | <b>The Terrestrial Biodiversity Specialist Assessment Report must contain, as a minimum, the following information:</b>                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                             |
| 3.1.1                                                                                      | Contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;                                                                                                                                                                                                                                                                                                                                                                               | <b>Part A:</b> Appendix E                                                                                                                   |
| 3.1.2                                                                                      | A signed statement of independence by the specialist;                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Part A:</b> Appendix E                                                                                                                   |
| 3.1.3                                                                                      | A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;                                                                                                                                                                                                                                                                                                                                                                | <b>Part B:</b> Section 1 & 2 (flora)<br><b>Part C:</b> Section 1 (fauna)                                                                    |
| 3.1.4                                                                                      | A description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modelling used, where relevant;                                                                                                                                                                                                                                                                                                                          | <b>Part A:</b> Appendix D<br><b>Part B:</b> Section 2 (flora) & Appendix A (flora)<br><b>Part C:</b> Section 2 (fauna) & Appendix A (fauna) |
| 3.1.5                                                                                      | A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;                                                                                                                                                                                                                                                                                                                         | <b>Part B:</b> Sections 1 & 2 (flora)<br><b>Part C:</b> Section 1 (fauna)                                                                   |
| 3.1.6                                                                                      | A location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant);                                                                                                                                                                                                                                                                                                                                                                    | <b>Part B:</b> Section 4 (flora)<br><b>Part C:</b> Section 4 (fauna)                                                                        |
|                                                                                            | <b>Impact Assessment Requirements</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Part B:</b> Sections 5 & 6 (flora)                                                                                                       |



| Theme-Specific Requirements as per Government Notice No. 320<br>Terrestrial Biodiversity Theme – Very High Sensitivity Rating as per Screening Tool Output |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| No.                                                                                                                                                        | SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Section in report/Notes                                              |
|                                                                                                                                                            | 3.1.7 Additional environmental impacts expected from the proposed development;<br>3.1.8 Any direct, indirect and cumulative impacts of the proposed development;<br>3.1.9 The degree to which impacts and risks can be mitigated;<br>3.1.10 The degree to which the impacts and risks can be reversed;<br>3.1.11 The degree to which the impacts and risks can cause loss of irreplaceable resources;<br>3.1.12 Proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr); | <b>Part C:</b> Sections 5 & 6 (fauna)                                |
| 3.1.13                                                                                                                                                     | A motivation must be provided if there were development footprints identified as per paragraph 2.3.6 above that were identified as having a “low” terrestrial biodiversity sensitivity and that were not considered appropriate;                                                                                                                                                                                                                                                                                                                                             | <b>Part B:</b> Section 4 (flora)<br><b>Part C:</b> Section 4 (fauna) |
| 3.1.14                                                                                                                                                     | A substantiated statement, based on the findings of the specialist assessment, regarding the acceptability, or not, of the proposed development, if it should receive approval or not; and                                                                                                                                                                                                                                                                                                                                                                                   | <b>To be completed by the EAP.</b>                                   |
| 3.1.15                                                                                                                                                     | Any conditions to which this statement is subjected.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Part B:</b> Section 6 (flora)<br><b>Part C:</b> Section 6 (fauna) |
| 3.2                                                                                                                                                        | The findings of the Terrestrial Biodiversity Specialist Assessment must be incorporated into the Basic Assessment Report or the Environmental Impact Assessment Report, including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr where relevant.                                                                                                                                                                                                                                                                             | <b>To be completed by the EAP.</b>                                   |
| 3.3                                                                                                                                                        | A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                      |



## ABBREVIATIONS AND ACRONYMS

|                |                                                                                |
|----------------|--------------------------------------------------------------------------------|
| <b>AIP</b>     | Alien and Invasive Plant                                                       |
| <b>BI</b>      | Biodiversity Importance                                                        |
| <b>C-Plan</b>  | Conservation Plan                                                              |
| <b>CBA</b>     | Critical Biodiversity Area                                                     |
| <b>CI</b>      | Conservation Importance                                                        |
| <b>CR</b>      | Critically Endangered                                                          |
| <b>DFFE</b>    | Department of Forestry, Fisheries, and the Environment                         |
| <b>EIS</b>     | Ecological Importance and Sensitivity                                          |
| <b>EN</b>      | Endangered                                                                     |
| <b>ECO</b>     | Environmental Control Officer                                                  |
| <b>EOO</b>     | Extent of Occurrence                                                           |
| <b>ESA</b>     | Ecological Support Area                                                        |
| <b>FI</b>      | Functional Integrity                                                           |
| <b>GBIF</b>    | Global Biodiversity Facility                                                   |
| <b>GDARDE</b>  | Gauteng Department: Agriculture, Rural Development and Environment             |
| <b>GIS</b>     | Geographic Information System                                                  |
| <b>GN</b>      | Government Notice                                                              |
| <b>GPS</b>     | Global Positioning System                                                      |
| <b>ha</b>      | hectares                                                                       |
| <b>IEM</b>     | Environmental Management                                                       |
| <b>km</b>      | kilometres                                                                     |
| <b>LC</b>      | Least Concern                                                                  |
| <b>m</b>       | metres                                                                         |
| <b>NBA</b>     | National Biodiversity Assessment                                               |
| <b>NEMA</b>    | National Environmental Management Act, 1998 (Act No. 107 of 1998)              |
| <b>NEMBA</b>   | National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) |
| <b>NFA</b>     | National Forest Act, 1998 (Act No. 84 of 1998), as amended                     |
| <b>NT</b>      | Near threatened                                                                |
| <b>NWA</b>     | National Water Act, 1998 (Act No. 36 of 1998), as amended                      |
| <b>PES</b>     | Present Ecological State                                                       |
| <b>POC</b>     | Probability of Occurrence                                                      |
| <b>QDS</b>     | Quarter Degree Square                                                          |
| <b>RDL</b>     | Red Data Listed                                                                |
| <b>RLE</b>     | Red List of Ecosystems                                                         |
| <b>RR</b>      | Receptor Resilience                                                            |
| <b>SACNASP</b> | South African Council for Natural Scientific Professions                       |
| <b>SANBI</b>   | South African National Biodiversity Institute                                  |
| <b>SCC</b>     | Species of Conservation Concern                                                |
| <b>SEI</b>     | Site Ecological Importance                                                     |
| <b>STS</b>     | Scientific Terrestrial Services (Pty) Ltd                                      |
| <b>TNCO</b>    | Transvaal Nature Conservation Ordinance, 1983 (Ordinance No. 12 of 1983)       |
| <b>TOPS</b>    | Threatened or Protected Species                                                |
| <b>VU</b>      | Vulnerable                                                                     |
| <b>WFO</b>     | World Flora Online                                                             |



## GLOSSARY OF TERMS

|                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Alien species (syn. exotic species; non-native species)</b>                                                                         | A species that is present in a region outside its natural range due to human actions (intentional or accidental) that have enabled it to overcome biogeographic barriers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Baseline (Integrated Environmental Management (IEM) Information Series: DEAT, 2004)</b>                                             | Conditions that currently exist. Also called “existing conditions”.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Biodiversity priority areas (Skowno et al., 2019)</b>                                                                               | Features in the landscape or seascape that are important for conserving a representative sample of ecosystems and species, for maintaining ecological processes, or for the provision of ecosystem services. They include the following categories, most of which are identified based on systematic biodiversity planning principles and methods: protected areas, Critically Endangered (CR) and Endangered (EN) ecosystems, Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA), Freshwater Ecosystem Priority Areas, high water yield areas, flagship free-flowing rivers, priority estuaries, focus areas for land-based protected area expansion, and focus areas for offshore protection. Marine ecosystem priority areas and coastal ecosystem priority areas have yet to be identified but will be included in future. The different categories are not mutually exclusive and, in some cases, overlap, often because a particular area or site is important for more than one reason. They should be complementary, with overlaps reinforcing the importance of an area. |
| <b>Biological diversity or Biodiversity (National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA))</b>   | The variability among living organisms from all sources including, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Biome (Mucina and Rutherford (2006); after Low and Rebelo (1998))</b>                                                               | A broad ecological spatial unit representing major life zones of large natural areas – defined mainly by vegetation structure, climate, and major large-scale disturbance factors (such as fires).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Bioregion (Mucina and Rutherford (2006); after Low and Rebelo (1998))</b>                                                           | A bioregion is a composite of spatial (vegetation) units sharing similar biotic and physio-geographical features and connected by processes operating on a regional scale.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Critical Biodiversity Areas (CBA: SANBI, 2020)</b>                                                                                  | An area that must be maintained in a good ecological condition (natural or semi-natural state) in order to meet biodiversity targets. CBAs collectively meet biodiversity targets for all ecosystem types, as well as for species and ecological processes that depend on natural or semi-natural habitat that have not already been met in the protected area network. CBAs are identified through a systematic biodiversity planning process in a configuration that is complementary, efficient and avoids conflict with other land uses where possible.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Community Characterisation</b>                                                                                                      | <p>Comparisons can be made among communities using attributes such as species richness, species diversity, and evenness.</p> <ul style="list-style-type: none"> <li>➤ <u>Species richness</u> is simply the number of species in a community.</li> <li>➤ <u>Species diversity</u> is more complex and includes a measure of the number of species in a community, and a measure of the abundance of each species.</li> <li>➤ <u>Species evenness</u> is a description of the distribution of abundance across the species in a community. Species evenness is highest when all species in a sample have the same abundance. Evenness approaches zero as relative abundances vary.</li> </ul> <p>Source: <a href="https://tinyurl.com/2p9yr3i8">https://tinyurl.com/2p9yr3i8</a></p>                                                                                                                                                                                                                                                                                                                 |
| <b>Corridor (van Wilgen et al., 2020)</b>                                                                                              | A dispersal route or a physical connection of suitable habitats linking previously unconnected regions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Critically Endangered (CR), i.e., International Union for Conservation of Nature (IUCN) Red List category (Skowno et al., 2019)</b> | <b>Applied to both species/taxa and ecosystems:</b> A species is CR when the best available evidence indicates that it meets at least one of the five IUCN criteria for CR, indicating that the species is facing an extremely high risk of extinction. CR ecosystem types are at an extremely high risk of collapse. Most of the ecosystem type has been severely or moderately modified from its natural state. The ecosystem type is likely to have lost much of its natural structure and functioning, and species                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |



|                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                         | associated with the ecosystem may have been lost. CR species are those considered to be at extremely high risk of extinction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Degradation (Skowno et al., 2019)</b>                                                                | The many human-caused processes that drive the decline or loss in biodiversity, ecosystem functions or ecosystem services in any terrestrial and associated aquatic ecosystems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Development footprint (National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA))</b> | <i>“In respect of land, means any evidence of its physical transformation as a result of the undertaking of any activity.”</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Disturbance (van Wilgen et al., 2020)</b>                                                            | A temporal change, either regular or irregular (uncertain), in the environmental conditions that can trigger population fluctuations and secondary succession. Disturbance is an important driver of biological invasions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Driver (ecological) (Lead et al., 2005)</b>                                                          | A driver is any natural or human-induced factor that directly or indirectly causes a change in ecosystem. A direct driver clearly influences ecosystem processes, where indirect driver influences ecosystem processes through altering one or more direct drivers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Ecological Condition (SANBI, 2017)</b>                                                               | <p><i>“Ecological condition”</i> means the extent to which the composition, structure and function of an area or biodiversity feature has been modified from a reference condition of “natural”.</p> <p>Various terminology can be used for the precision of language:</p> <ul style="list-style-type: none"> <li>➤ <u>Fair ecological condition</u>: Areas that are moderately modified, semi-natural. An ecological condition class in which ecological function is maintained even though composition and structure have been compromised. Can apply to a site or an ecosystem.</li> <li>➤ <u>Good ecological condition</u>: Areas that are natural or near-natural. An ecological condition class in which composition, structure and function are still intact or largely intact. Can apply to a site or an ecosystem.</li> <li>➤ <u>Poor ecological condition</u>: Areas that are severely or irreversibly modified. An ecological condition class in which ecological function has been compromised in addition to structure and composition. Can apply to a site or an ecosystem.</li> </ul> |
| <b>Ecological Support Areas (ESA: Skowno et al., 2019)</b>                                              | An ESA provides connectivity and important ecological processes between CBAs and is therefore important in terms of habitat conservation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Endangered (EN), i.e., Red List category (Skowno et al., 2019)</b>                                   | <b>Applied to both species/taxa and ecosystems:</b> A species is EN when the best available evidence indicates that it meets at least one of the five IUCN criteria for EN, indicating that the species is facing a very high risk of extinction. EN ecosystem types are at a very high risk of collapse. EN species are those considered to be at very high risk of extinction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Endemic species (SANBI, 2020)</b>                                                                    | A species that is naturally restricted to a particular, well-defined region, i.e., species that are only found within a pre-defined area. There can therefore be sub-continental (e.g., southern Africa), national (South Africa), provincial, regional, or even within a particular mountain range.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Ground-Truth</b>                                                                                     | To check the accuracy of (remotely sensed data) through in-situ observations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Habitat (NEMBA)</b>                                                                                  | A place where a species or ecological community naturally occurs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Indigenous species (synonym: native species)</b>                                                     | <p><u>SANBI (2020) definition</u>: Occurring naturally in a defined area (contrast with endemic) – the area must be specified and is normally taken to be the historical range of a species, notwithstanding the effects of naturally initiated range expansions/ contractions, e.g., the baobab (<i>Adansonia digitata</i>) is indigenous but not endemic to South Africa, but it is not indigenous to KwaZulu-Natal.</p> <p><u>NEMBA definition</u>: A species that occurs, or has historically occurred, naturally in a free state in nature within the borders of the Republic of South Africa but excludes a species that has been introduced in the Republic as a result of human activity, e.g., the bontebok (<i>Damaliscus pygargus pygargus</i>) is indigenous to only South Africa, but according to the previous definition would only be indigenous to the Western Cape.</p>                                                                                                                                                                                                            |
| <b>Indigenous vegetation (NEMA) - compare with “endemic” and “native”</b>                               | Vegetation that occurs naturally within a defined area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Integrity (ecological)</b>                                                                           | “An ecosystem is generally understood to have integrity when its dominant ecological characteristics (e.g., elements of composition, structure, function, and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |



|                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                       | ecological processes) occur within their natural ranges of variation and can withstand and recover from most perturbations" (CBD/SBSTTA/24/3/Add.2/Rev.1, para. 18).<br>Indicators of ecosystem integrity may include the "structure, function and composition of an ecosystem relative to the preindustrial range of variation of these characteristics" (Hansen et al., 2021).                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Invasive species (ecological) (van Wilgen et al., 2020)</b>        | Alien species that sustain self-replacing populations over several life cycles, produce reproductive offspring, often in very large numbers at considerable distances from the parent and/or site of introduction, and have the potential to spread over long distances.                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Listed alien species</b>                                           | All alien species that are regulated in South Africa under the NEMBA: Alien and Invasive Species Regulations, 2020.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Least Threatened</b>                                               | Least threatened ecosystems are still largely intact.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Native species</b>                                                 | A species that is within its known natural range, and occurs naturally in a given area or habitat, as opposed to an introduced species or invasive species.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Primary grasslands (SANBI, 2013)</b>                               | Primary grasslands are those that have not been significantly modified from their original state; even though they may no longer have their full complement of naturally occurring species, they have not undergone significant or irreversible modification and still retain their essential ecological characteristics.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Quarter Degree Square (QDS) (SANBI, 2020)</b>                      | A way of dividing the longitude latitude degree square cells into smaller squares of 15' x 15' (roughly 24 x 27 kilometres (km)), forming in effect a system of geocodes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Red Data Listed (RDL) species</b>                                  | According to the Red List of South African plants ( <a href="http://redlist.sanbi.org/">http://redlist.sanbi.org/</a> ) and the IUCN, organisms that fall into the Extinct in the Wild (EW), CR, EN, Vulnerable (VU) categories of ecological status.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Secondary grasslands (SANBI, 2013)</b>                             | Secondary grasslands are those that have undergone irreversible modification from their original ecological state. Such grasslands may superficially have the appearance of primary grasslands, but differ markedly with respect to species composition, vegetation structure and ecological functioning.                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Species of Conservation Concern (SCC)</b>                          | The term SCC in the context of this report refers to all RDL and IUCN listed threatened species as well as protected species of relevance to the project.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Terrestrial Species (SANBI, 2020)</b>                              | For the purposes of the species environmental guidelines (SANBI, 2020), terrestrial species are considered to represent species that are not exclusively marine and occur on land (at least for a portion of their life cycle). This includes amphibians (frogs and toads) but excludes other freshwater aquatic species which are considered to be aquatic (e.g., fish, diatoms and aquatic macroinvertebrates). This definition is not an accurate biological definition but rather applied in this manner to align with the Protocol on Terrestrial Biodiversity.                                                                                                                                                                                |
| <b>Threatened ecosystem (Skowno et al., 2019)</b>                     | An ecosystem that has been classified as CR, EN or VU, based on an analysis of ecosystem threat status. A threatened ecosystem has lost or is losing vital aspects of its structure, function, or composition. The Biodiversity Act allows the Minister of Environmental Affairs or a provincial Member of the Executive Council for Environmental Affairs to publish a list of threatened ecosystems. To date, threatened ecosystems have been listed only in the terrestrial environment. In cases where no list has yet been published by the Minister, such as for all aquatic ecosystems, the ecosystem threat status assessment in the National Biodiversity Assessment (NBA) can be used as an interim list in planning and decision making. |
| <b>Threatened species (Skowno et al., 2019)</b>                       | A species that has been classified as CR, EN or VU, based on a conservation assessment (Red List), using a standard set of criteria developed by the IUCN for determining the likelihood of a species becoming extinct. A threatened species faces a high risk of extinction in the near future.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Vulnerable (VU), i.e., Red List category (Skowno et al., 2019)</b> | Applied to both species/taxa and ecosystems: A species is VU when the best available evidence indicates that it meets at least one of the five IUCN criteria for VU, indicating that the species is facing a high risk of extinction. An ecosystem type is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for VU and is then considered to be at a high risk of collapse.                                                                                                                                                                                                                                                                                                                           |



# 1 INTRODUCTION

Scientific Terrestrial Services (Pty) Ltd. (“STS” hereafter) was appointed to conduct a terrestrial biodiversity assessment for the proposed Vorna Valley Spark School, in the Carlswald suburb of Midrand, Gauteng Province. The proposed development is located on the TLC stables property, where both stabling for horses and riding lessons are offered. The proposed development is within an urban area where much of the land has been developed into residential properties. The M39 metropolitan route is approximately 377 meters (m) south of the proposed development area, and the R55 provincial route is approximately 1 kilometre (km) west of the study area.

The proposed development area will henceforth be referred to as the **study area**, of which the location, extent, and proposed development layouts are depicted in Part A: Figures 1 - 3.

## 1.1 Scope of Work

This report aims to present a detailed account of the terrestrial biodiversity and plant species data (interchangeably referred to as the “floral assessment”) for the study area and to identify areas of increased ecological importance and sensitivity (EIS) from a botanical perspective, as well as the mapping of such areas, and to describe the present ecological state (PES) of the study area relating to the terrestrial biodiversity theme and the plant species theme of the Department of Forestry, Fisheries, and the Environment's (DFFE) National Web-based Screening Tool (hereafter “screening tool”).

The primary objective of this assessment is not to compile an exhaustive floral species list but rather to ensure that sufficient data are collected to describe all the vegetation communities present in the study area, to optimise the detection of species of conservation concern (SCC), and to assess habitat suitability for other potentially occurring SCC (SANBI, 2020).

The terrestrial biodiversity and plant species report includes the following:

- A description of the various floral habitat types, communities, and the ecological state of such communities within the study area and a ranking of each habitat type based on conservation importance and ecological sensitivity;
- Inventories of floral species as encountered within the study area;
- Maps and discussions of sensitive landscapes associated with the study area, such as indigenous forests, rocky ridges, wetlands and/or any other special features such as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs);



- An assessment of Red Data Listed (RDL) floral species, as well as an assessment of other floral SCC (such as nationally and provincially protected flora), including the potential for such species to occur within the study area; and
- Information and recommendations that will ensure the ongoing functioning of the ecosystem within the study area in a manner that supports local and regional conservation requirements, meets regional and national biodiversity targets, and sustains the provision of ecological services in the local area.

## 1.2 Assumptions and Limitations

The following assumptions and limitations apply to this report:

- The results of the floral assessment, as presented in this report, are confined to the study area. The immediate surroundings do not form part of this assessment but were included in the desktop analysis, of which the results are presented in **Part A: Section 3**;
- Sampling, by its nature, means that not all individuals are assessed and identified. Given the dynamic and complex nature of ecology, some aspects (some of which may be important) may have been overlooked. Nevertheless, given the experience of the specialist within the area, together with adequate coverage of the study area, as well as the essentially modified nature of the study area, the survey was deemed sufficient for drawing adequate conclusions regarding the ecological condition and sensitivity of the various habitats therein;
- The identities of some floral SCCs will not be disclosed in this report, although their potential occurrence within the study area was still evaluated. According to the best practice guideline accompanying the DFFE's screening tool and the Species Environmental Assessment Guidelines (SANBI, 2020), the names of sensitive species may not appear in any of the specialist reports that would be publicly available. Such species will be referred to as sensitive plants, with their threat status included;
- The floral assessment took place on 19 June 2025 (winter season), which falls outside the optimal season for floral assessments in Gauteng (GDARD, 2014). It further does not overlap with the flowering season of the triggered SCCs (i.e., *Melolobium subspicatum*: September-May, and Sensitive species 1248: September-April). Nevertheless, given the seasonal limitation, the focus of the assessment was on identifying habitats that could support these species, rather than detecting the species themselves, which was considered appropriate given the consultant's experience in the area and with these species; and



- This report addresses aspects of habitats regarded as wetlands; however, these habitats are assessed solely from a botanical and terrestrial ecological perspective. Aspects related to the drivers and receptors of a freshwater feature (namely the hydraulic regime, geomorphological processes, water quality, and aquatic habitat and biota), as well as its designation as a watercourse<sup>1</sup> per the National Water Act, 1998 (Act No. 36 of 1998), as amended (NWA), can only be addressed by a qualified freshwater ecologist and are dealt with separately in the specialist Freshwater Ecosystem Assessment (Scientific Aquatic Services, 2026).

## 2 ASSESSMENT APPROACH

This section briefly describes the assessment method used for the floral study. Additional details about the approach can be found in Appendix A of this report.

### 2.1 Reporting Protocol

The study area was partially identified as a medium-sensitivity area for the Plant Species Theme by the screening tool. Conversely, the study area was identified as a very high sensitivity area for the Terrestrial Biodiversity Theme. Following the field assessment, the medium sensitivity for the Plant Species Theme was disputed, and a low sensitivity was instead verified (refer to Section 5). The very high sensitivity of the Terrestrial Biodiversity Theme was confirmed, owing to the presence of ESAs (see Section 3.5).

Consequently, the reporting protocol for the Plant Species Theme adhered to the requirements of a Plant Species Compliance Statement, whereas the Terrestrial Biodiversity Theme adheres to the protocol for very high/high sensitivity and thus a Terrestrial Biodiversity Specialist Assessment was undertaken (please refer to the document guides in this report).

For refined sensitivities, please refer to the Site Ecological Importance (SEI) breakdown in Section 4 of this report.

### 2.2 General Approach

Before conducting the field assessment, a desktop study was performed to gather background information regarding the study area, including the surrounding areas (refer to **Part A**). This

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<sup>1</sup> In terms of the definition contained within the National Water Act, 1998 (Act No. 36 of 1998), a watercourse means:

- A river or spring;
- A natural channel which water flows regularly or intermittently;
- A wetland, dam, or lake into which, or from which, water flows; and
- Any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse;

and a reference to a watercourse includes, where relevant, its bed and banks.



involved consulting maps, aerial photographs, and digital satellite images to determine broad habitats and potential sensitive areas. A literature review of the habitats, vegetation types, and distributions of floral species within and surrounding the study area was undertaken, while also considering the threat status of the ecosystem(s) in the study area. The conservation requirements and biodiversity goals, at national and provincial levels, of the biodiversity features associated with the study area were also considered.

Following the desktop assessment and literature review, a field assessment was undertaken to confirm the presence of potentially sensitive habitats and to compile floral species inventories for each habitat type identified within the study area. The developed species lists include potential floral SCC and alien floral species.

## 2.3 Sampling Effort

The floral assessment took place on the 19<sup>th</sup> of June 2025. The floral assessment was carried out by a botanist registered with the South African Council for Natural Scientific Professions (SACNASP). The botanical specialist walked several meanderings during the field assessment, surveying various plant species and recording the habitat conditions.

## 2.4 Definitions, descriptions, and taxon nomenclature

Scientific nomenclature for plant species in this report follows that of the Red List of South African Plants<sup>2</sup> (<http://redlist.sanbi.org/index.php>) and the South African National Biodiversity Institute (SANBI) Biodiversity Advisor<sup>3</sup> (<https://biodiversityadvisor.sanbi.org/>). This largely follows the nomenclature of the World Flora Online (WFO) Plant List<sup>4</sup> (<https://wfoplantlist.org/>), however, some names differ between the WFO and the Red List of South African Plants. For alien (or exotic) species, the definitions of Richardson et al. (2011) are used. The description of vegetation structure broadly followed the guidelines of Edwards (1983) (see **Appendix A: Figure A1**).

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<sup>2</sup> The Threatened Species Program is one of the continent's largest collaborative conservation projects to date. South Africa has become the first megadiverse country to fully assess the status of its entire flora. The Red List of South African Plants Online provides up-to-date information on the national conservation status of South Africa's indigenous plants.

<sup>3</sup> Open access to South Africa's biodiversity data:

- Occurrence records: 2 120 409
- Animal and plant checklists: 3
- Data partners: 17
- Image records: 194 863
- Species of plants, animals and fungi: 85 878
- Planning and ecosystem assessment spatial layers: 551

<sup>4</sup> The standardisation and cataloguing of plant names are critical in various fields of biology, including biodiversity, biogeography, and vegetation research. The WFO Plant List is the most comprehensive and authoritative list of the world's plants, maintained by the global community of taxonomic experts as a free and open-access resource.



## **2.5 Habitat and Sensitivity Mapping**

All botanical features, including various vegetation and habitat types as well as the specific distributions of plant species were deemed necessary, within the study area were comprehensively considered. Delineation of different habitat types or floral communities was conducted utilising a Global Positioning System (GPS). Subsequently, areas of increased sensitivity and conservation importance were identified and correlated with the delineated habitats. A Geographic Information System (GIS) was used to project these features onto satellite imagery, and the sensitivity levels of the resultant features were systematically mapped.

The various habitat types were assigned SEI categories (SANBI, 2020) based on their functional integrity, conservation value, the presence of SCCs and their resilience to disturbances. Refer to **Appendix A** for a breakdown of the SEI methodology.

Maps were produced using ArcMap (ESRI, 2020), supported by additional Geographic Information System (GIS) tools for various stages of analysis:

- Google Earth Pro (Google Earth Pro, 2025): used for planning and initial delineation of habitat boundaries;
- Global Mapper (Blue Marble Geographics, 2023): used for data processing and integration; and
- ArcMap (ESRI, 2020): used for visual analysis, map creation, and report-ready outputs.

## **2.6 Species of Conservation Concern (SCC) Assessment**

An assessment of the presence of any floral SCCs, as well as suitable habitat to support any such species, was undertaken. As part of the SCC assessment, the following classes were considered (Box 1 - 3):



**BOX 1: THREATENED SPECIES**

In terms of Section 56(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA), threatened species are RDL species falling into the following categories of ecological status: critically endangered (CR), endangered (EN), and vulnerable (VU) in terms of the NEMBA Threatened or Protected Species (TOPS) Regulations (Government Notice (GN) R152 of 2007, as amended). Near threatened (NT) species are not considered RDL species; however, are still considered to be of increased conservation importance and are thus also included in the threatened species assessments. Removal, translocation, and/or destruction of these species require authorisation from, and consultation with, the DFFE.

In addition to species triggered by the screening tool, site-specific and Quarter Degree Square (QDS)-specific Red Listed floral species were provided to STS by the Gauteng Department: Agriculture, Rural Development and Environment (GDARDE).

**BOX 2: NATIONALLY PROTECTED SPECIES**

Protected species in terms of the NEMBA TOPS Regulations (GN R152 of 2007, as amended), i.e., species that have a least concern (LC) threat status but are still protected under the TOPS regulations. The List of Protected Tree Species (GN 1935) as published in the Government Gazette 46094 dated 25 March 2022, as it relates to the National Forest Act, 1998 (Act No. 10 of 1998) (NFA), was also considered for the SCC assessment.

**BOX 3: PROVINCIALLY PROTECTED SPECIES**

Species that are deemed important from a provincial biodiversity perspective include, e.g., species listed in the Transvaal Nature Conservation Ordinance, 1983 (Ordinance No. 12 of 1983) (TNCO) includes provincially protected plants under Schedule 11 (Protected Plants) and Schedule 12 (Specially Protected Species). Permits for removing, harming, or destroying species on the TNCO list will require permits from the GDARDE.

To compile a list of potentially occurring SCCs (both threatened and protected) for the study area—an essential step before conducting the field assessment—several methods were utilised, including the screening tool, iNaturalist, and various national and provincial legislations as outlined in Box 1 above. A Probability of Occurrence (POC) assessment forms part of the floral assessment, and a POC score is assigned to SCCs that are located within or have the potential to be within the study area. This POC score indicates the likelihood of a species being present in the study area, and for each potential floral SCC, the POC is detailed as follows:

- “Confirmed”: if observed during the survey;
- “High”: if within the species’ known distribution range and suitable habitat is available;
- “Medium”: if either within the known distribution range of the species or if suitable habitat is present; or
- “Low”: if the habitat is not suitable and falls outside the distribution range of the species.

The accuracy of the POC is based on the available knowledge about the species in question, as many of these species lack in-depth habitat research.



### 3 RESULTS OF THE PLANT SPECIES ASSESSMENT

This section provides a description and discussion of the baseline data collected during the floral site assessment.

#### 3.1 *Vegetation Types and Fine-Scale Habitats*

The study area is characterised by a single vegetation type, according to SANBI (2024), namely the **Egoli Granite Grassland**. According to the 2022 Red List of Ecosystems (RLE) database (SANBI, 2022a; 2022b), this vegetation type has a CR threat status. At a broad landscape scale, the Egoli Granite Grassland vegetation type was used as the reference state against which floral communities were compared to ascertain habitat integrity and deviance from, and/or similarity to, the expected state.

The study area has undergone transformation and modification over the years, resulting in the loss of the original reference grassland vegetation type, namely the Egoli Granite Grassland (mentioned earlier). Currently, the southern section of the study area is built up, forming part of the TLC Stables. The property comprises stables, workshops, houses, soil dumps, grass lawns, and other agricultural impacts such as small vegetable gardens. The central section of the study area includes a freshwater system and an artificial dam, whereas the northern section of the study area includes a patch of open veld used by the horses. In this area, the grassland is considered both modified, comprising areas historically disturbed by nearby construction activities (Figure 1), and secondary, consisting of a small, fragmented patch of grassland that has experienced significant alteration from its original ecological state, with notable differences in species composition, vegetation structure, and ecological function compared to the reference condition (further discussions are provided in the sections below).





**Figure 1: Areas of disturbance (indicated by yellow arrows on the pictures) within the remaining patch of natural grassland north of the freshwater system (tributary of the Jukskei river). In 2004, which is the earliest available Google Satellite Imagery, the northern patch was still unaffected. In 2008, the western section was used as a dump site. In 2018, the eastern section was physically disturbed (dumping, etc.), and by 2025, the disturbance was still present.**

Three habitat units (Figures 2 and 3) were delineated within the study area based on vegetation structure and the dominant plant groups observed in the vegetation communities, as well as on habitat integrity and the ecological processes the habitats support. The delineated habitat units included:

- Freshwater Habitat (1.23 ha);
- Modified Habitat (6.27 ha); and
- Secondary Grassland (1.11 ha).

The deviance of each vegetation type from its reference state, including the ecological condition of each of the habitat units, is further described and discussed in the dashboards below under Tables 1 – 3.

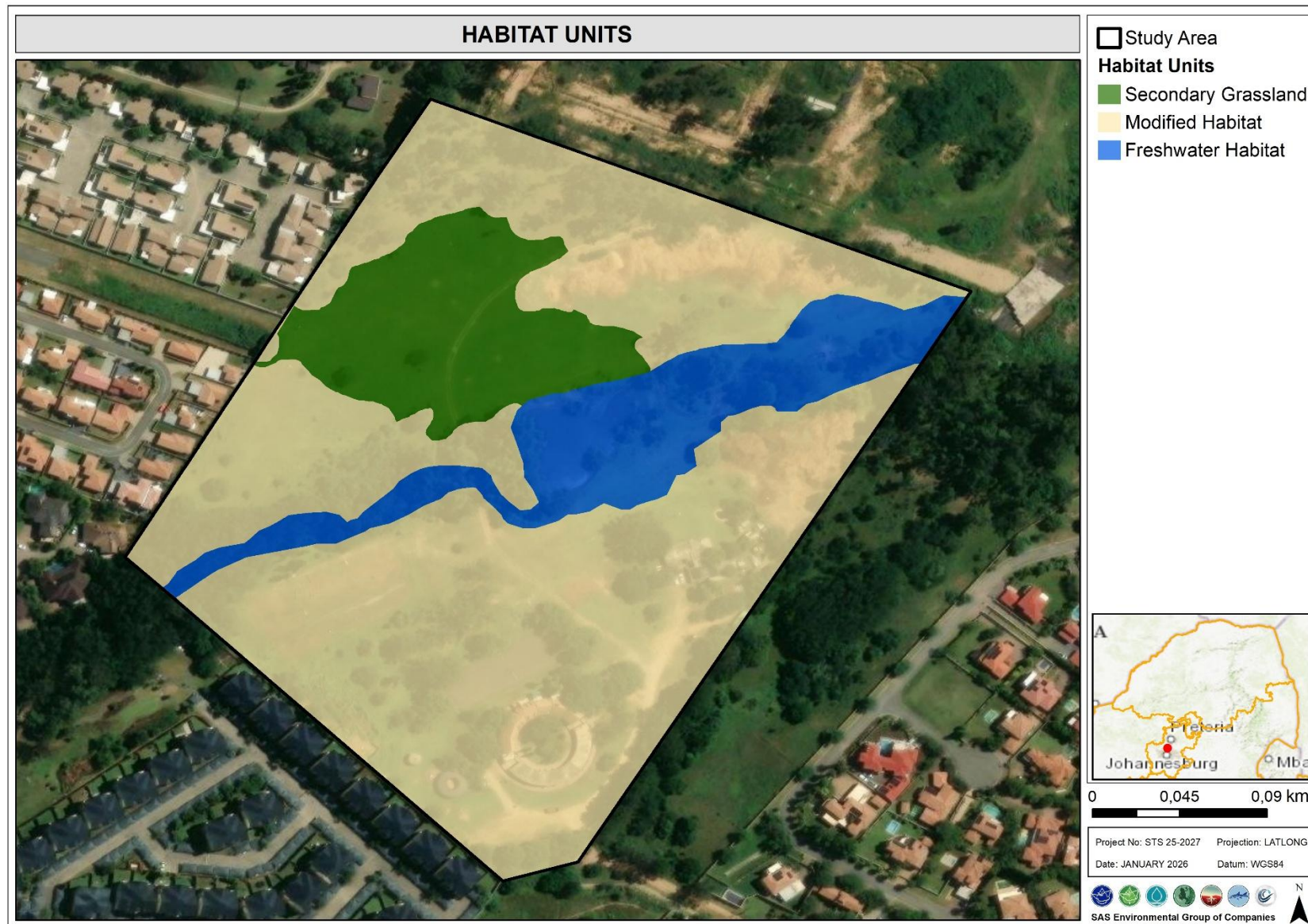


Figure 2: Conceptual illustration of the habitat units within the study area.



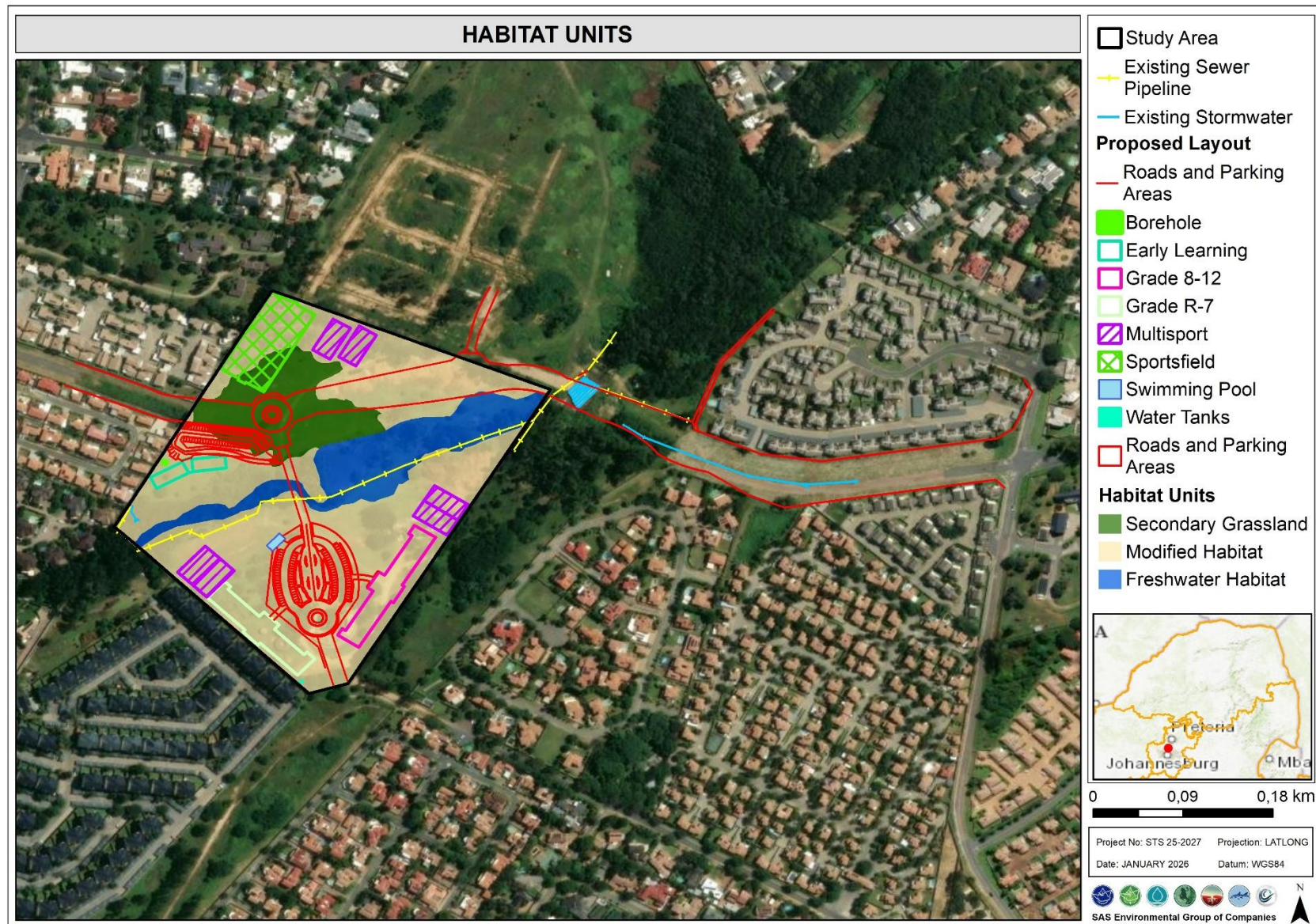


Figure 3: Conceptual illustration of the habitat units within the study area.



**Table 1: Freshwater Habitat.****REPRESENTATIVE HABITAT PHOTOGRAPHS**

Photographs of the artificial dam in the central sections of the study area (various angles of the Freshwater Habitat depicted).



Representative photographs of the Freshwater Habitat, i.e., an unnamed tributary of the Jukskei River. The left photograph depicts a more herbaceous and graminoid-dominated habitat upstream of the artificial dam. In contrast, the middle and left photographs depict the Freshwater Habitat downstream of the artificial dam, where the river largely lacks a floral species composition typical of a river system, especially considering the significant encroachment of alien and invasive plant (AIP) trees.



| HABITAT & SPECIES OVERVIEW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                               |
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| <p>A tributary of the Jukskei River runs diagonally through the centre of the assessed study area. In the central part of the Freshwater Habitat, an artificial dam was constructed prior to 2004. This dam is part of a series of artificial dams along this system, both upstream and downstream of the study area. Such dams typically alter the system's overall hydrological function by altering the natural flow and sedimentation, thereby increasing the risk of riverbed and bank erosion. This was a notable impact on the downstream sections of the Freshwater Habitat. Floristically, the tributary has been significantly altered in the sections downstream of the artificial dam, where the vegetation mainly consists of AIP trees, with <i>Eucalyptus camaldulensis</i> and <i>Populus × canescens</i> being the most prominent. The riverbed and banks were mostly devoid of vegetation, apart from a few herbaceous AIPs. Upstream of the dam, the Freshwater Habitat was more floristically diverse, although it remained heavily modified in species composition. Some parts of the habitat upstream of the dam were also associated with large stands of <i>Eucalyptus camaldulensis</i> and <i>Populus × canescens</i> trees, but these were outside the property boundary. In contrast, the section of the Freshwater Habitat within the property boundary was characterised by a graminoid and herbaceous species composition.</p> <p>Main impacts on the floral communities associated with the Freshwater Habitat include:</p> <ul style="list-style-type: none"> <li>➤ Riverbank erosion;</li> <li>➤ Invasion of herbaceous AIPs and significant encroachment of AIP trees;</li> <li>➤ Poor water quality; and</li> <li>➤ Increased litter loads.</li> </ul> <p>The Freshwater Habitat is in <b>poor ecological condition</b>, characterised by areas that are severely or irreversibly modified and where ecological function has been compromised, in addition to the structure and composition of the habitat. The vegetation structure of the Freshwater Habitat can be described as a <b>tall, closed woodland</b> (as per Diagram A1 in Appendix A) within the sections where AIP trees are dominant, with a <b>short, closed grassland</b> structure elsewhere.</p> <p>Floristically, the Freshwater Habitat has a low species richness, much of which is characterised by AIPs. The vegetation is neither representative of the reference vegetation type nor typical of a healthy vegetation cover for rivers. Examples of species observed in the Freshwater Habitat include (refer also to Appendix B):</p> <ul style="list-style-type: none"> <li>➤ <u>AIP species</u>: <i>Acacia</i> sp., <i>Achyranthes aspera</i>, <i>Araujia sericifera</i>, <i>Bidens pilosa</i>, <i>Eucalyptus camaldulensis</i>, <i>Flaveria bidentis</i>, <i>Melia azedarach</i>, <i>Populus × canescens</i>, <i>Solanum chenopodioides</i>, and <i>Solanum mauritianum</i> (to name a few). Refer also to Section 3.2 of this report;</li> <li>➤ <u>Forb component</u>: <i>Leonotis nepetifolia</i>, <i>Persicaria cf. decipiens</i>, <i>Plantago lanceolata</i>, and <i>Ranunculus multifidus</i>;</li> <li>➤ <u>Graminoid component</u>: <i>Cynodon dactylon</i>, <i>Juncus effusus</i>, and <i>Typha capensis</i>;</li> <li>➤ <u>Succulent component</u>: None, and none anticipated for this habitat given the increased moisture levels therein; and</li> <li>➤ <u>Woody component</u>: <i>Asparagus laricinus</i>, <i>Celtis Africana</i>, <i>Searsia lancea</i>, and <i>Vachellia karroo</i>.</li> </ul> |                                                                                                                                                                                                                                                                                                               |
| SPECIES OF CONSERVATION CONCERN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                               |
| Protected Species (refer also to Appendix C).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | The Freshwater Habitat is not important for populations of protected plant species. Although some TNCO-listed species have the potential to be present, the incidence of these species in the Freshwater Habitat would be very low. Refer to the outcomes of the SCC assessments for the habitat units below. |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p><b>Protected species under the NEMBA TOPS Regulations (GN R152 of 2007):</b></p> <ul style="list-style-type: none"> <li>➤ None were recorded, and none are anticipated to be present. No suitable habitat for TOPS-protected species is associated with the Freshwater Habitat.</li> </ul>                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p><b>Protected trees on the NFA List of Protected Tree Species (GN 1935 of 2022):</b></p> <ul style="list-style-type: none"> <li>➤ None were recorded, and none are anticipated to be present.</li> </ul>                                                                                                    |



|                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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|                                                                                                                                                                                                                                                                                                                                                                                                | <b>Specially Protected and Protected Species (TNCO-protected):</b> <ul style="list-style-type: none"> <li>➤ <i>Gladiolus</i> spp. (Status = Species-specific. POC = High); and</li> <li>➤ <i>Kniphofia</i> spp. (Status = Species-specific. POC = Medium).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Threatened species</b>                                                                                                                                                                                                                                                                                                                                                                      | None anticipated. Refer to section 5.1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>BIODIVERSITY PRIORITY AREAS<sup>5</sup>/ CONSERVATION SIGNIFICANCE</b>                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| The biodiversity importance and conservation significance of the study area are primarily determined by the triggering features identified in the screening tool (Terrestrial Biodiversity Theme) and by additional provincial and national datasets presented in Part A. The conservation features and their relation to the habitat units identified for the study area are presented below. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>CR ecosystem: Egoli Granite Grassland</b>                                                                                                                                                                                                                                                                                                                                                   | Not applicable to the Freshwater Habitat. Refer to Table 3 for a discussion on the CR Egoli Granite Grassland.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>CBAs<sup>6</sup> and ESAs<sup>7</sup></b>                                                                                                                                                                                                                                                                                                                                                   | <p>The 2024 Gauteng Conservation Plan (C-Plan) indicates that the study area is associated with a CBA 1. The CBA triggers cannot be fully discounted; however, when evaluated against the criteria in the C-Plan technical document, the habitat is more indicative of ESA habitat than of CBA habitat.</p> <p>Refer to the breakdown below of the triggers and how these relate to the Freshwater Habitat:</p> <ul style="list-style-type: none"> <li>➤ <b>The presence of a ridge (Gauteng Ridges 2023).</b> A small portion of the northern and south-eastern sections of the study area intersects with two Class 4 Ridges (as per the 2023 Gauteng Ridges dataset). The Freshwater Habitat does not form part of the ridge, and the CBA criterion is not met in this case.</li> <li>➤ <b>The presence of a life zone,</b> which is an ecologically meaningful buffer around wetlands and rivers, making provision for species that utilise both aquatic and terrestrial habitats. An ecologically relevant buffer has been determined by a qualified freshwater ecologist (Scientific Aquatic Services, 2026), consisting of a 15 m buffer around the Freshwater Habitat and a 10 m buffer around the artificial dam. This buffer qualifies as a semi-natural life zone, which, according to the C-Plan technical document, is the qualifying criterion for an ESA 1.</li> </ul> <p>Based on the discussions above, the Freshwater Habitat does not contain any biodiversity features of irreplaceable value that would constitute the presence of CBA habitat. However, the Freshwater Habitat and the ecological buffer meet the criteria of an ESA 1.</p> |

<sup>5</sup> Features in the landscape or seascape that are important for conserving a representative sample of ecosystems and species, for maintaining ecological processes, or for the provision of ecosystem services. They include the following categories, most of which are identified based on systematic biodiversity planning principles and methods: protected areas, Critically Endangered and Endangered ecosystems, Critical Biodiversity Areas and Ecological Support Areas, Freshwater Ecosystem Priority Areas, high water yield areas, flagship free-flowing rivers, priority estuaries, focus areas for land-based protected area expansion, and focus areas for offshore protection.

<sup>6</sup> **Critical Biodiversity Areas (CBAs)** are the parts of the landscape we want to keep natural and are required for meeting biodiversity targets. CBAs can also be defined as areas required to meet biodiversity targets for ecosystems, species or ecological processes, as identified in a systematic biodiversity plan. These areas may be terrestrial or aquatic.

<sup>7</sup> **Ecological Support Areas (ESAs)** support the ecological functioning of CBAs and/or provide ecosystem services. ESAs need to stay functional in order to maintain the integrity of the CBAs, but do not need to be maintained in a natural state to do so as long as their natural function is retained. As a consequence, land use and management differ between CBAs and ESAs. ESAs play an important role in supporting the ecological functioning of one or more CBA or in delivering ecosystem services. These areas may be terrestrial or aquatic.



**Table 2: Modified Habitat.**

| REPRESENTATIVE HABITAT PHOTOGRAPHS                                                                                                                                                                                                                                                                                                                                  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| <div>    </div> <p>Photographs of dump sites in the study area.</p>                                           |  |  |
| <div>    </div> <p>Representative photographs of the built-up sections associated with the study area.</p> |  |  |





AIP tree stands in the study area: *Eucalyptus camaldulensis* (left), *Populus x canescens* (middle), and *Pinus* sp. (right).

#### HABITAT & SPECIES OVERVIEW

The Modified Habitat includes areas where natural vegetation no longer exists due to habitat conversion. Refer to the below for an indication of the various ways in which modification has taken place:

- Alien and ornamental tree stands: Represented by the garden trees (i.e., ornamental) around the houses within the study area. Additionally, there are larger stands of AIP trees, such as denser stands of *Pinus* sp. and *Eucalyptus camaldulensis*, which surround the built-up areas and occur along the boundaries of the study area and Freshwater Habitat;
- Grass lawns: Several sections in the southern parts of the study area include stretches of open grass lawns composed of various grasses, but predominantly the non-native grass *Cenchrus clandestinus*;
- Modified grassland: These areas have experienced historical disturbance (as depicted in Figure 1 earlier in the report) and are now mainly composed of herbaceous AIPs; and
- Transformed habitat: Sections that have been converted into houses, workshops, and stables for the horses.

The Modified Habitat is in **poor ecological condition**, characterised by an anthropogenic landscape, with low floral diversity and poor representation of native floral species. As the habitat is not considered natural, no vegetation structure is assigned to this habitat unit.

Examples of species observed in the Modified Habitat include (refer also to Appendix B):

- AIP species: *Alternanthera pungens*, *Amaranthus cf. hybridus*, *Bidens pilosa*, *Cestrum cf. parqui*, *Flaveria bidentis*, *Ipomoea purpurea*, *Malva* sp., *Melia azedarach*, *Morus alba*, *Quercus robur*, *Robinia pseudoacacia*, *Tecoma stans*, and *Ulmus parvifolia*;
- Forb component: Very species-poor. Only *Cucumis metuliferus* and *Leonotis martinicensis* were noted during the site assessment. Several indigenous garden plants are present, but not listed here, as they are not naturally occurring in the area;
- Graminoid component: Mainly non-native grasses like *Cenchrus clandestinus* and *Eragrostis minor*, but native grasses like *Chloris pycnothrix* were also observed; and
- Woody component: *Asparagus larinicus*, *Gomphocarpus fruticosus*, *Searsia lancea*, and *Vachellia karroo*.



| SPECIES OF CONSERVATION CONCERN                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Protected Species (refer also to Appendix C).                                                                                                                                                                                                                                                                                                                                                  | <p>No protected species are anticipated to occur in this habitat unit, apart from one protected under the TNCO for the AIP tree stands.</p> <p><b>Specially Protected and Protected Species (TNCO-protected):</b></p> <ul style="list-style-type: none"> <li>➤ <i>Scadoxus</i> spp. (Status = Species-specific. POC = Medium).</li> </ul> |
| Threatened species                                                                                                                                                                                                                                                                                                                                                                             | None anticipated. Refer to section 5.1.                                                                                                                                                                                                                                                                                                   |
| BIODIVERSITY PRIORITY AREAS/ CONSERVATION SIGNIFICANCE                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                           |
| The biodiversity importance and conservation significance of the study area are primarily determined by the triggering features identified in the screening tool (Terrestrial Biodiversity Theme) and by additional provincial and national datasets presented in Part A. The conservation features and their relation to the habitat units identified for the study area are presented below. |                                                                                                                                                                                                                                                                                                                                           |
| CR ecosystem: Egoli Granite Grassland                                                                                                                                                                                                                                                                                                                                                          | The Modified Habitat is not representative of the CR ecosystem.                                                                                                                                                                                                                                                                           |
| CBAs and ESAs                                                                                                                                                                                                                                                                                                                                                                                  | No CBAs or ESAs are associated with or verified in the Modified Habitat.                                                                                                                                                                                                                                                                  |



**Table 3: Secondary Grassland.**

| REPRESENTATIVE HABITAT PHOTOGRAPHS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| <div data-bbox="219 304 1111 815" data-label="Image"> </div> <div data-bbox="1120 304 2011 815" data-label="Image"> </div> <div data-bbox="678 818 1561 850" data-label="Caption"> <p>Photographic overview of the Secondary Grassland (north of the Freshwater Habitat).</p> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| HABITAT & SPECIES OVERVIEW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <p>It is recognised that the assessment took place outside of the optimal season for vegetation assessments in Gauteng, and especially for those conducted in grasslands. However, during the site assessment, it was evident that the grassland patch no longer represents the reference Egoli Granite Grassland (as discussed below). The study area as a whole has been subjected to numerous impacts, including direct transformation, AIP encroachment, and habitat fragmentation.</p> <p>The fragmentation of the grassland habitat is largely attributable to the surrounding urban context, as the study area is almost entirely immediately surrounded by residential development. A small undeveloped but degraded area occurs in the north-eastern portion of the site; however, this area is also fully enclosed by surrounding urban land uses. Consequently, the Secondary Grassland represents the last remaining patch of natural veld on the property and within an approximate 5–6 km radius and is therefore significantly isolated.</p> <p>In addition, the Secondary Grassland is currently utilised for horse grazing, and evidence of grazing pressure was observed, particularly in the predominantly short-grassland structure.</p> <p>The significant deviation of the Secondary Grassland from the reference state was most clearly observed in the notable modifications to the species composition and vegetation structure of the Secondary Grassland. Bredenkamp et al. (2006) provide the most detailed description of the Egoli Granite Grassland in Gauteng, and by comparing key aspects of the “<b>original Egoli Granite Grassland</b>” – as phrased by Bredenkamp et al. (2006) – the grassland community in the study area falls short. Firstly, the original Egoli Granite Grassland is recognised as a diverse ecosystem with several endemic forb and grass species. However, the species composition of the Secondary Grassland in the study area was low and mainly consisted of common, hardy</p> |



species typically found in disturbed areas or widespread across most highveld grasslands (i.e., generalists<sup>8</sup>). Furthermore, several indicators suggest that the Secondary Grassland is a degraded grassland that no longer supports any essential aspects of the Egoli Granite Grassland, namely:

- The presence of AIPs;
- The overall scarcity of fauna – populations of grassland-dependent animals, particularly birds and butterflies, are sparse or absent, highlighting the decline in ecological integrity; and
- The highly fragmented condition of the grassland and the ongoing edge effects experienced by the grassland community due to its proximity to anthropogenic activities (e.g., increased AIPs and a notable absence of geophytes, which are typically abundant in thriving grassland systems).

The Secondary Grassland is in **fair ecological condition**, characterised by moderately modified, semi-natural habitats. Although the ecological function is somewhat maintained, the species composition and vegetation structure have been compromised. The vegetation structure of the Secondary Grassland can be described as a **medium-tall to short, semi-closed grassland** (as per Diagram A1 in Appendix A).

Floristically, the Secondary Grassland has a moderately low species richness. The vegetation is neither representative of the reference vegetation type nor typical of a healthy grassland ecosystem. Examples of species observed in the Secondary Grassland include (refer also to Appendix B):

- AIP species: *Bidens pilosa*, *Erigeron cf. bonariensis*, *Glandularia aristigera*, *Richardia brasiliensis* (abundant), *Robinia pseudoacacia*, *Schkuhria pinnata*, and *Trifolium repens*. Refer also to Section 3.2 of this report;
- Forb component: *Cucumis metuliferus*, *Helichrysum nudifolium* var. *nudifolium*, *Helichrysum rugulosum*, *Hilliardiella elaeagnoides*, *Plantago lanceolata*, and *Sida cf. dregei*;
- Graminoid component: *Aristida congesta* subsp. *congesta*, *Cymbopogon caesius*, *Eragrostis gummiflua*, *Eragrostis plana* (abundant), *Hyparrhenia hirta*, *Sporobolus africanus* (abundant), and *Themeda triandra*;
- Succulent component: None, which is uncharacteristic of the original Egoli Granite Grassland; and
- Woody component: *Felicia muricata*, *Searsia lancea*, and *Seriphium* sp.

#### SPECIES OF CONSERVATION CONCERN

|                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Protected Species (refer also to Appendix C).</b> | <p>The Secondary Grassland is not important for populations of protected plant species. Although some TNCO-listed species may be present, their incidence in this habitat would be very low. Refer to the outcomes of the SCC assessments for the habitat units below.</p> <p><b>Protected species under the NEMBA TOPS Regulations (GN R152 of 2007):</b></p> <ul style="list-style-type: none"> <li>➤ None were recorded, and none are anticipated to be present. No suitable habitat for TOPS-protected species is associated with the Secondary Grassland.</li> </ul> <p><b>Protected trees on the NFA List of Protected Tree Species (GN 1935 of 2022):</b></p> <ul style="list-style-type: none"> <li>➤ None were recorded, and none are anticipated to be present.</li> </ul> <p><b>Specially Protected and Protected Species (TNCO-protected):</b></p> <ul style="list-style-type: none"> <li>➤ <i>Eucomis</i> spp. (Status = Species-specific. POC = Medium); and</li> <li>➤ <i>Gladiolus</i> spp. (Status = Species-specific. POC = High).</li> </ul> |
| <b>Threatened species</b>                            | <p>None anticipated. Refer to section 5.1.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

<sup>8</sup> Plant species are generally categorised as either generalists or specialists, depending on how they use resources and habitat preferences. Generalists can survive in many different environments and make use of a variety of resources. In contrast, specialists are limited to specific habitats or depend on particular resources..



| BIODIVERSITY PRIORITY AREAS/ CONSERVATION SIGNIFICANCE                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The biodiversity importance and conservation significance of the study area are primarily determined by the triggering features identified in the screening tool (Terrestrial Biodiversity Theme) and by additional provincial and national datasets presented in Part A. The conservation features and their relation to the habitat units identified for the study area are presented below. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>CR ecosystem: Egoli Granite Grassland</b>                                                                                                                                                                                                                                                                                                                                                   | As discussed above, the Secondary Grassland no longer resemble the reference state. The lack of indicators of healthy grasslands (per SANBI, 2013), the lower than anticipated diversity of floral species, the fragmentation from other healthy representative patches of Egoli Granite Grassland, and the lack of natural fire and herbivory regimes to maintain ecological functioning and integrity of the Secondary Grassland have resulted in a significant shift from the reference state (both structurally and compositionally).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>CBAs and ESAs</b>                                                                                                                                                                                                                                                                                                                                                                           | <p>The 2024 Gauteng C-Plan indicates that the study area is associated with a CBA 1. The CBA triggers cannot be fully discounted; however, following the criteria outlined in the C-Plan technical document, the habitat may more accurately be classified as ESA habitat rather than CBA habitat. Please refer to the detailed breakdown below of the triggers and their reduced relevance to the habitat associated with the Secondary Grassland:</p> <ul style="list-style-type: none"> <li>➤ <b>The presence of a ridge (Gauteng Ridges 2023).</b> A small part of the northern and south-eastern sections of the study area intersects with two Class 4 Ridges (according to the 2023 Gauteng Ridges dataset). The Secondary Grassland marginally intersects with one of the ridges but mostly occurs outside of it. Therefore, the CBA criteria in this case are not verified.</li> <li>➤ <b>The presence of a life zone,</b> an ecologically meaningful buffer around wetlands and rivers, provides habitat for species that utilise both aquatic and terrestrial habitats. Table 1 describes the ecological buffer around the Freshwater Habitat that would apply to this criterion. The Secondary Grassland, however, is outside of this buffer, and therefore, the CBA criterion in this instance is not verified.</li> </ul> <p>Based on the discussions above, the Secondary Grassland does not host any biodiversity features of irreplaceable value that would constitute the presence of CBA habitat.</p> |



## 3.2 Alien and Invasive Plant (AIP) Species

South Africa is home to an estimated 759 naturalised or invasive terrestrial plant species (Richardson et al., 2020), with 327 plant species, most of which are invasive, listed in national legislation<sup>9</sup>. Many introduced species are beneficial, e.g., almost all agricultural and forestry production relies on alien species, and they are also widely used in industries such as horticulture. However, some of these species manage to “escape” from their original locations, spread and become invasive. Although only a small proportion of introduced species become invasive (~0.1–10%), those that do proceed to negatively impact biodiversity and the services that South Africa’s diverse natural ecosystems provide (from ecotourism to harvesting food, cut flowers, and medicinal products) (van Wilgen and Wilson, 2018).

### 3.2.1 Legal Context

South Africa has released several articles of legislation that are applicable to the control of alien species. Currently, invasive species are controlled by the NEMBA – Alien and Invasive Species Regulations, 2020, in Government Gazette 43735 dated 25 September 2020. AIPs defined in terms of NEMBA are assigned a category and listed within the NEMBA List of Alien and Invasive Species (2020) in accordance with Section 70(1)(a) of the NEMBA:

- **Category 1a** species are those targeted for urgent national eradication;
- **Category 1b** species must be controlled as part of a national management programme, and cannot be traded or otherwise allowed to spread;
- **Category 2** species are the same as category 1b species, except that permits can be issued for their usage (e.g., invasive tree species can still be used in commercial forestry, providing a permit is issued that specifies where they may be grown and that permit holders “*Unless otherwise specified in the Notice, any species listed as a Category 2 Listed Invasive Species that occurs outside the specified area contemplated in sub-regulation (1), must, for purposes of these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to Regulation 3*”); and
- **Category 3** are listed invasive species that can be kept without permits, although they may not be traded or further propagated, and must be considered a Category 1b species if they occur in riparian zones.

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<sup>9</sup> Government Notice (GN) number 1003: Alien and Invasive Species Lists, 2020, in Government Gazette 43726 dated 18 September 2020, as it relates to the National Environmental Management Biodiversity Act, 2004 (Act No 10 of 2004).



Duty of Care, or responsibilities, regarding listed invasive species are mentioned in Section 73 of NEMBA<sup>10</sup>. Both environmental and economic considerations drive the motivation for this duty of care. The management of alien species in South Africa is estimated to cost at least ZAR 2 billion (approximately US\$142 million) annually, which is the amount currently allocated by the national government's DFFE, specifically the Working for Water programme (van Wilgen, 2020). Managing AIPs early on will ultimately reduce clearing costs.

### 3.2.2 Site Results

The study area has a wide variety of AIPs, with the highest abundance in the Modified Habitat and the Freshwater Habitat. The Secondary Grassland is not associated with many AIPs, but it is certainly not devoid of AIPs. In total, 36 AIPs were recorded during the 2025 site assessment, 12 of which are listed as Category 1b invaders, two are listed as Category 2 invaders, two are listed as Category 3 invaders, and the remaining species are not currently listed. Species such as *Bidens pilosa* and *Tagetes minuta* are not listed on the NEMBA list of invasive species, but they tend to become problematic and proliferate in areas with increased disturbance. The abundance of *Richardia brasiliensis*, which is also not currently listed, within the Secondary Grassland (forming an almost continuous herbaceous mat beneath the grasses) can prevent the establishment of native forbs and is evidence of grazing pressure in this habitat unit. Managing AIPs is essential and highly recommended for the study area.

Refer to Table 4 below for more information on the AIPs recorded within the various habitat units.

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<sup>10</sup> Section 73(2): A person who is the owner of land on which a listed invasive species occurs must-

- a) notify any relevant competent authority, in writing, of the listed invasive species occurring on that land;
- b) take steps to control and eradicate the listed invasive species and to prevent it from spreading; and
- c) take all the required steps to prevent or minimise harm to biodiversity.



**Table 4: AIP species recorded in the study area.**

| Scientific name                        | Common name                                   | Country or place of origin                                                | NEMBA status                                  | Modified / Transformed | Freshwater Habitat | Secondary Grassland |
|----------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------|------------------------|--------------------|---------------------|
| <b>WOODY SPECIES</b>                   |                                               |                                                                           |                                               |                        |                    |                     |
| <i>Acacia</i> sp.                      | Wattle                                        | Australia                                                                 | 2                                             | x                      | x                  |                     |
| <i>Cestrum</i> cf. <i>parqui</i>       | Chilean cestrum                               | Central and South America                                                 | 1b                                            | x                      |                    |                     |
| <i>Eucalyptus camaldulensis</i>        | Red river gum                                 | Australia                                                                 | 1b within- (i) riparian areas                 | x                      | x                  |                     |
| <i>Melia azedarach</i>                 | Seringa                                       | From Asia to Australia, the form in southern Africa is an Indian cultivar | 1b (within a watercourse)<br>3 in urban areas | x                      | x                  |                     |
| <i>Morus alba</i>                      | White mulberry, Common mulberry               | Asia                                                                      | 3                                             | x                      | x                  |                     |
| <i>Pinus</i> sp.                       | Pine                                          | Species-dependent                                                         | Species-dependent                             | x                      |                    |                     |
| <i>Populus</i> × <i>canescens</i>      | Grey poplar                                   | Uncertain. This is a hybrid species.                                      | 2                                             | x                      | xx                 |                     |
| <i>Quercus robur</i>                   | English oak                                   | Native to most of Europe and western Asia                                 | Not listed                                    | x                      |                    |                     |
| <i>Robinia pseudoacacia</i>            | Black locust                                  | North America                                                             | 1b                                            | x                      | x                  | x                   |
| <i>Solanum mauritianum</i>             | Bugweed                                       | South America                                                             | 1b                                            | x                      | x                  |                     |
| <i>Tecoma stans</i>                    | Yellow bells                                  | Mexico and Southern America                                               | 1b                                            | x                      | x                  |                     |
| <i>Ulmus parvifolia</i>                | Chinese elm                                   | Eastern Asia                                                              | Not Listed                                    | x                      |                    |                     |
| <b>FORB SPECIES</b>                    |                                               |                                                                           |                                               |                        |                    |                     |
| <i>Achyranthes aspera</i>              | Burweed                                       | Of uncertain origin. Probably indigenous to South-East Asia and Africa.   | Not Listed                                    | x                      | x                  |                     |
| <i>Alternanthera pungens</i>           | Creeping chaffweed                            | South America                                                             | Not Listed                                    | x                      |                    |                     |
| <i>Amaranthus</i> cf. <i>hybridus</i>  | Smooth pigweed                                | Originally from the Americas                                              | Not Listed                                    | x                      |                    |                     |
| <i>Araujia sericifera</i>              | Moth catcher                                  | South America                                                             | 1b                                            | x                      | x                  |                     |
| <i>Bidens pilosa</i>                   | Common blackjack                              | Cosmopolitan weed native to South and Central America                     | Not Listed                                    | x                      | x                  | x                   |
| <i>Datura stramonium</i>               | Common thorn apple                            | Tropical America.                                                         | 1b                                            | x                      | x                  |                     |
| <i>Erigeron</i> cf. <i>bonariensis</i> | Flax-leaf fleabane                            | Americas                                                                  | Not Listed                                    |                        | x                  | x                   |
| <i>Flaveria bidentis</i>               | Smelter's bush                                | South America                                                             | 1b                                            | x                      | x                  |                     |
| <i>Glandularia aristigera</i>          | Fine-leaved verbena                           | South America                                                             | Not Listed                                    |                        |                    | x                   |
| <i>Heliotropium amplexicaule</i>       | Blue Heliotrope                               | South America                                                             | Not Listed                                    | x                      |                    |                     |
| <i>Ipomoea purpurea</i>                | Purple morning glory;<br>Common morning glory | Tropical America                                                          | 1b                                            | x                      |                    |                     |



| Scientific name               | Common name                               | Country or place of origin                                                                                                                               | NEMBA status                                | Modified / Transformed | Freshwater Habitat | Secondary Grassland |
|-------------------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|------------------------|--------------------|---------------------|
| <i>Malva cf. parviflora</i>   | Small mallow                              | Europe and Asia                                                                                                                                          | Not Listed                                  | x                      |                    |                     |
| <i>Plantago major</i>         | Broad-leaved plantain                     | Eurasia                                                                                                                                                  | Not Listed                                  |                        | x                  |                     |
| <i>Richardia brasiliensis</i> | Mexican richardia                         | Ecuador to North Argentina                                                                                                                               | Not Listed                                  | x                      |                    | xx                  |
| <i>Schkuhria pinnata</i>      | Dwarf marigold                            | South America                                                                                                                                            | Not Listed                                  | x                      |                    | x                   |
| <i>Solanum chenopodioides</i> | Whitetip nightshade or Velvety nightshade | South America                                                                                                                                            | Not Listed                                  |                        | x                  |                     |
| <i>Tagetes minuta</i>         | Khaki bush, Khaki weed                    | South and North America                                                                                                                                  | Not Listed                                  | x                      | x                  |                     |
| <i>Trifolium repens</i>       | White Clover                              | Mediterranean region of Asia Minor and is indigenous to the whole of Europe, Central Asia west of Lake Baikal, and to small areas in Morocco and Tunisia | Not Listed                                  |                        | x                  |                     |
| <i>Verbena bonariensis</i>    | Tall verbena                              | South America                                                                                                                                            | 1b                                          |                        | x                  | x                   |
| <i>Zinnia peruviana</i>       | Peruvian zinnia                           | Mexico to Brazil, Peru and Bolivia                                                                                                                       | Not Listed                                  |                        |                    | x                   |
| <b>SUCCULENT SPECIES</b>      |                                           |                                                                                                                                                          |                                             |                        |                    |                     |
| <i>Yucca cf. aloifolia</i>    | Aloe yucca                                | The Atlantic and Gulf Coasts of the United States                                                                                                        | Not Listed                                  | x                      |                    |                     |
| <b>GRAMINOID SPECIES</b>      |                                           |                                                                                                                                                          |                                             |                        |                    |                     |
| <i>Cenchrus clandestinus</i>  | Kikuyu grass                              | East Africa                                                                                                                                              | Category 1b in protected areas and wetlands | x                      | x                  |                     |
| <i>Eragrostis minor</i>       | Little lovegrass or Smaller stinkgrass    | Native to most of the subtropical and warm temperate Old World                                                                                           | Not Listed                                  | x                      |                    |                     |
| <i>Paspalum urvillei</i>      | Vasey grass                               | Argentina and Uruguay                                                                                                                                    | Not Listed                                  | x                      | x                  |                     |



### **3.3 Medicinal Plant Species**

In developing countries, plants provide people with fuel, food, medicines, and materials for construction and craft. Having knowledge of which plant species are useful for different aspects of everyday life thus plays an important role in the daily lives of thousands of people across South Africa. Such knowledge, hereafter “traditional knowledge”, is important for two main reasons: i) it plays a role in retaining cultural identity, and ii) it aims to achieve unattainable natural resource management (Maroyi, 2017).

Medicinal plant species are not necessarily restricted to indigenous species; many medicinally important species in South Africa are regarded as AIPs. The medicinal species identified for the study area are generally commonly occurring and are not necessarily confined to the study area. The table below (Table 5) presents a list of plant species with traditional medicinal value, as well as the plant parts traditionally used, and the main applications thereof.



**Table 5: Dominant traditional medicinal floral species identified during the field assessment. Medicinal applications and application methods are also presented (van Wyk, Oudtshoorn, Gericke, 2009). Alien species indicated with an asterisk (\*).**

| Species                      | Name                                         | Plant parts used                         | Medicinal uses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------|----------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| * <i>Achyranthes aspera</i>  | Burweed                                      | Roots                                    | Expectorant; inflammation of the mouth; hypotonic, diuretic, uterus contactant.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| * <i>Bidens pilosa</i>       | Blackjack                                    | Herb                                     | Astringent, diuretic, inflammation of the digestive tract; antidiarrheal.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| * <i>Datura stramonium</i>   | Common thorn apple                           | Leaves and seed (rarely the green fruit) | Traditionally used to relieve asthma and relieve pain. The elderly also use the plant as a hypnotic, while adults use it as an aphrodisiac. This is a toxic plant.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| * <i>Ipomoea purpurea</i>    | Common Morning Glory                         | Seeds                                    | The seed is anthelmintic, diuretic and laxative. It is used in the treatment of oedema, oliguria, ascariasis and constipation. The seed contains small quantities of the hallucinogen. This has been used medicinally in the treatment of various mental disorders.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| * <i>Melia azederach</i>     | Syringa                                      | Leaves, roots, bark, seeds, and fruit    | <p>An aqueous extract reduces the intensity of asthmatic attacks. The leaf juice is anthelmintic, antilithic, diuretic and emmenagogue. A decoction is astringent and stomachic. A decoction is used to treat diarrhoea. The leaves are used externally to treat skin conditions such as scabies and itch. A decoction is used as a gargle to treat tooth problems and strengthen the gums. The leaves are harvested during the growing season and can be used fresh or dried. The flowers and leaves are applied as a poultice in the treatment of neuralgia and nervous headache. The stem bark is anthelmintic, astringent and bitter tonic. It is used as a tonic in India. It can be harvested at any time of the year and is used fresh or dried.</p> <p>The root bark is emetic, emmenagogue, purgative and vermifuge. It is highly effective against ringworm and other parasitic skin diseases. It can be harvested at any time of the year and is used fresh or dried. The fruit is antiseptic and febrifuge. The pulp is used as a vermifuge. The fruit is harvested in the autumn when it is fully ripe and can be used fresh or dried. The seed is antirheumatic. It is used externally. Some consider a gum that exudes from the tree to have aphrodisiac properties. This plant should be used with caution, preferably under the supervision of a qualified practitioner. Excess causes diarrhoea, vomiting and symptoms of narcotic poisoning. Source: <a href="http://tropical.theferns.info/viewtropical.php?id=Melia+azedarach">http://tropical.theferns.info/viewtropical.php?id=Melia+azedarach</a></p> |
| * <i>Morus alba</i>          | White mulberry, Silkworm mulberry            | Leaves, fruit, and bark                  | Food for silkworms; expectorant; colds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| * <i>Plantago major</i>      | Greater plantain                             | Leaves                                   | Used widely since ancient times, it has been employed to manage a wide range of diseases, including constipation, coughs, and wounds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| * <i>Populus x canescens</i> | Grey poplar                                  | Bark                                     | The bark is anodyne, anti-inflammatory and febrifuge. It is used especially in treating rheumatism and fevers, and also to relieve the pain of menstrual cramps.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| * <i>Quercus robur</i>       | Common oak, Pedunculate oak, or European oak | Bulb                                     | Anti-diarrhoeal; astringent; anti-microbial.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| * <i>Schkuhria pinnata</i>   | Dwarf Mexican marigold                       | The whole plant                          | The plant has a wide variety of medical uses including the following: antibiotic, anti-inflammatory, digestive upset, coughs, diuretic, diabetes, kidney and liver problems, malaria, allergies, varicose                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |



| Species                           | Name                                     | Plant parts used                             | Medicinal uses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------|------------------------------------------|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                   |                                          |                                              | veins, fungal (yeast) infections, obesity, prostate inflammation, bloating, diarrhoea, rheumatism, skin conditions (acne, dermatitis, and eczema). Tea is also taken to regulate hormones, urinary tract infections and kidney pain, as well as to help digestion (antispasmodic actions).                                                                                                                                                                                                                                                                                     |
| <i>*Tagetes minuta</i>            | Khaki bush, Khaki weed, African marigold | Leaves, stalks and flowers                   | It is also grown commercially in South Africa, France and North America for its essential oil. The oil is very effective for wounds and a wide variety of infections.                                                                                                                                                                                                                                                                                                                                                                                                          |
| <i>*Ulmus parvifolia</i>          | Chinese elm                              | Root bark                                    | Used traditionally for the treatment of wounds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <i>Cynadon dactylon</i>           | Couch grass                              | A decoction of the whole plant               | The plant has long been used in traditional medicines to treat various ailments such as anasarca, cancer, convulsions, cough, cramps, diarrhoea, dropsy, dysentery, epilepsy, headache, haemorrhage, hypertension, hysteria, measles, rubella, snakebite, sores, stones, tumours, urogenital disorders, warts and wounds. The plant shows biological activities such as antiviral and antimicrobial properties.                                                                                                                                                                |
| <i>Gomphocarpus fruticosus</i>    | Milkweed, Wild Cotton                    | Leaves are mainly used, sometimes the roots. | Leaves are used as snuff and as a sedative in the treatment of headache and tuberculosis. Roots are used to relieve stomach pain and general aches in the body.                                                                                                                                                                                                                                                                                                                                                                                                                |
| <i>Helichrysum</i> sp.            | Everlastings                             | Leaves and twigs, sometimes roots.           | Many ailments are treated, including coughs, colds, fever, headache and menstrual pain and also used in wound dressing.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <i>Hermannia</i> sp.              | Doll's Roses                             | Leaves, Roots                                | Many members of the genus are used medicinally, for anything ranging from respiratory diseases, coughs and internal aches, as stimulants or purgatives, to soothing wounds and cuts.                                                                                                                                                                                                                                                                                                                                                                                           |
| <i>Hilliardiella elaeagnoides</i> | Groenamara                               | Leaves and twigs                             | Infusions are taken as stomach bitters to treat abdominal pain and colic.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <i>Plantago lanceolata</i>        | Ribwort Plantain                         | Leaves and herbs                             | Anti-inflammatory; expectorant.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <i>Typha capensis</i>             | Bulrush                                  | Rhizomes                                     | Used for venereal diseases during pregnancy to ensure an easy delivery, and for dysmenorrhoea, diarrhoea, dysentery, and to enhance male potency and libido.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <i>Vachellia karroo</i>           | Sweet thorn                              | Bark, leaves, roots, and gum                 | The sweet thorn has many medicinal uses, ranging from wound poultices to eye treatments and cold remedies. The bark, leaves and gum are usually used. It is also used to treat cattle that have tulip poisoning ( <i>Homeria /Moraee</i> spp), which are bulbous plants that are poisonous to stock.<br><br>A root infusion is taken by local people to treat pain in the alimentary canal, rheumatism, convulsions, gonorrhoea and as an aphrodisiac. Root powder is applied to the penile sores for treating syphilis. A bark decoction is an emetic for treating diarrhoea. |



## 4 SITE ECOLOGICAL IMPORTANCE (SEI) AND AREAS OF CONCERN

This section aims to (1) present the sensitivity of the receptors identified within the study area (e.g., SCC, the vegetation/fauna community or habitat type present on the site), and (2) clearly define and map areas where avoidance mitigation is strongly recommended if significant, negative residual impacts are to be avoided (and to prevent potential fatal flaws).

Based on the criteria provided in Appendix A of this report, all habitats within the study area were allocated an importance category, i.e., SEI category. SEI is a function of the biodiversity importance (BI) of the receptor and its resilience to impacts (receptor resilience [RR]). BI, in turn, is a function of conservation importance (CI) and the functional integrity (FI) of the receptor. For an SEI of “Very High” and “High”, avoidance mitigation is recommended (see development constraints section of Table 6). Table 6 indicates the individual SEI scoring for each habitat unit/receptor. Figures 4 and 5 illustrate the SEI for the receptors identified in the study area.



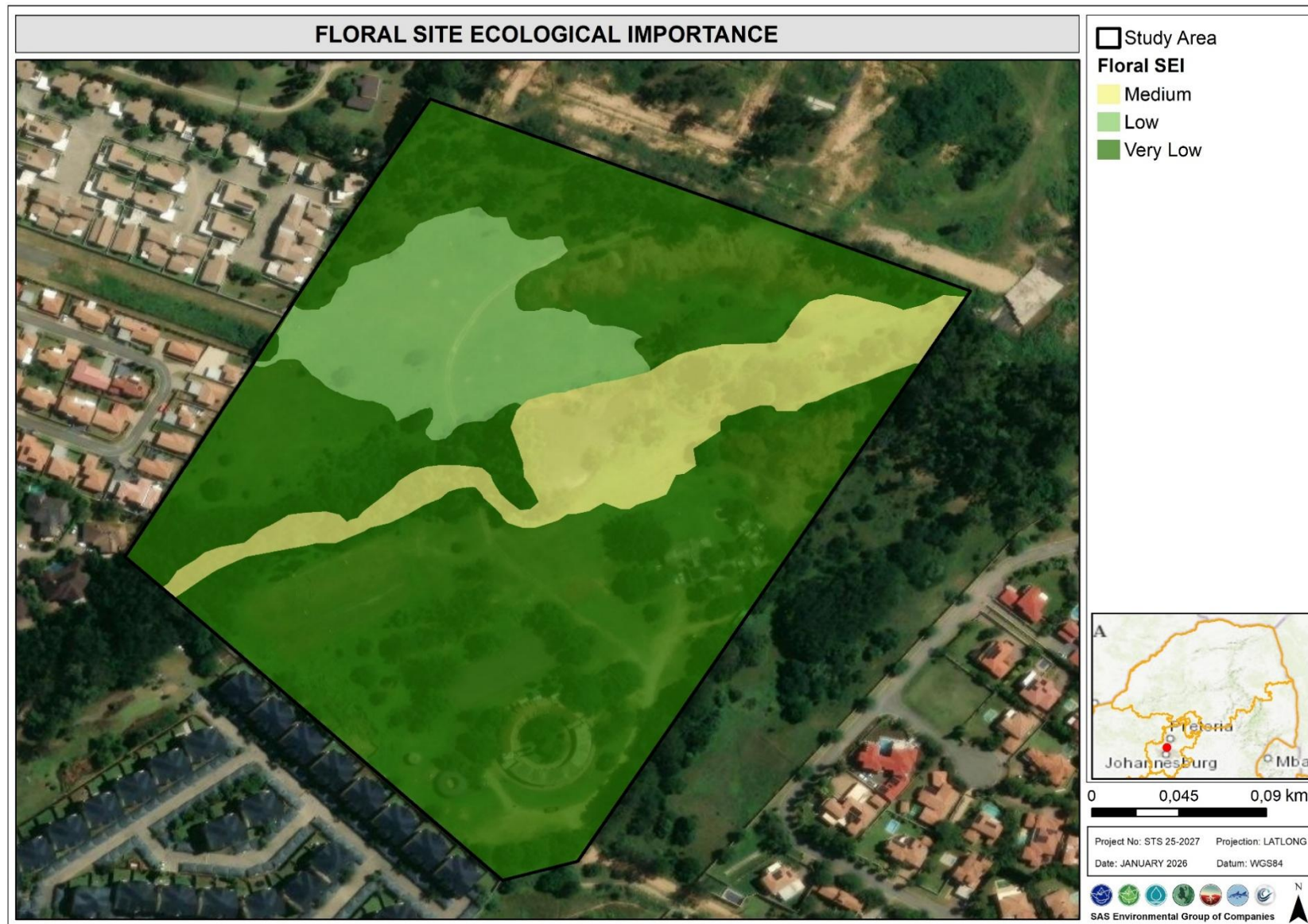


Figure 4: Conceptual illustration of the floral SEIs within the study area.



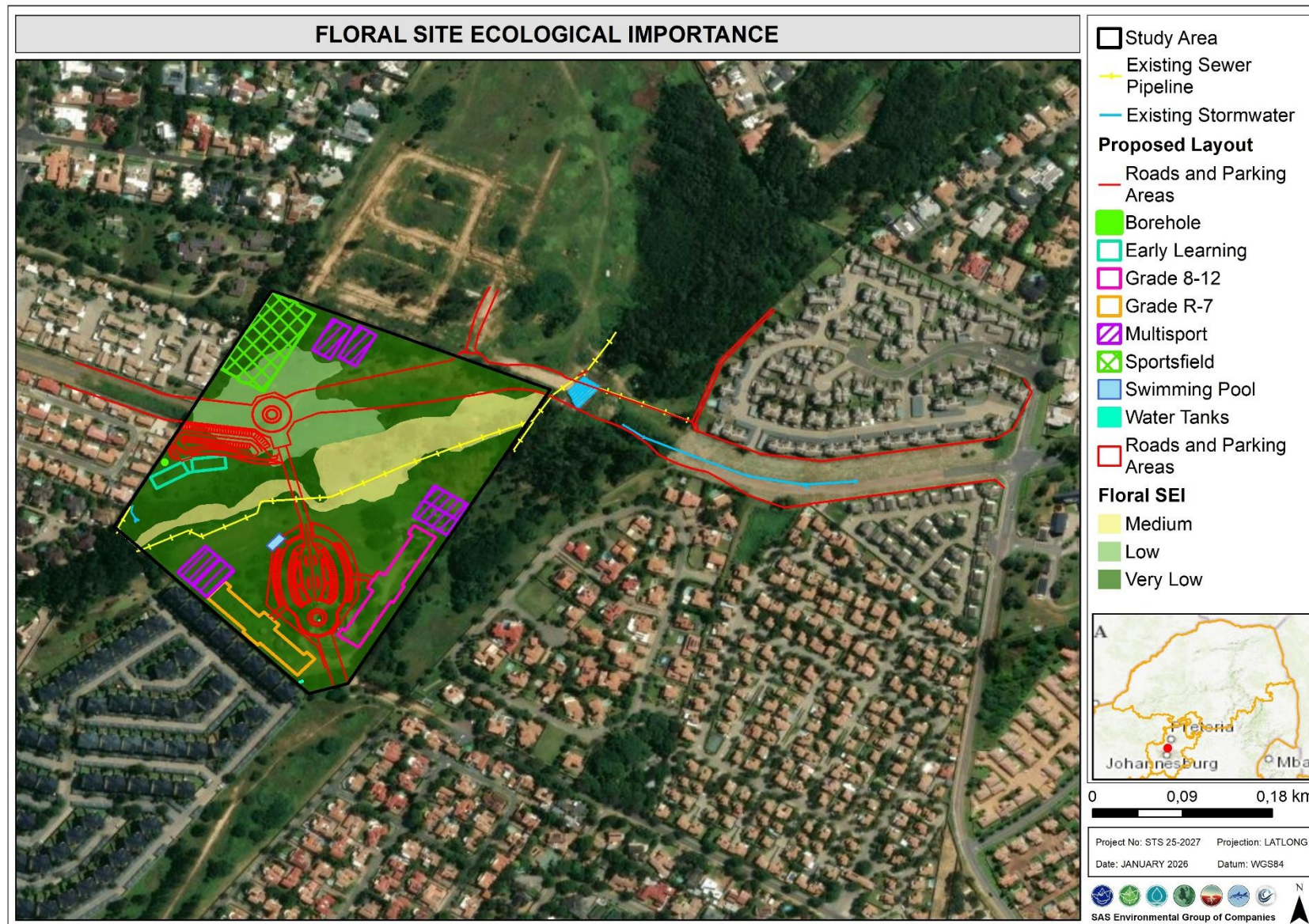


Figure 5: Conceptual illustration of the proposed layout superimposed onto the floral SEIs within the study area.



**Table 6: SEI importance for the different habitat units (i.e., receptors) in the study area. Acronyms in the table header row include BI = biodiversity importance, CI = conservation importance, FI = functional integrity, RR = receptor resilience, and SEI = Site Ecological Importance.**

| Habitat Unit        | CI                                                               | FI                                                                                                                                                                                                                                                             | BI              | RR                                                                                                                                                                                                                                                                                                           | SEI             | Development Constraints                                                                                                                                        |
|---------------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Freshwater Habitat  | <b>Low</b><br>*No confirmed or highly likely populations of SCC. | <b>Low</b><br>*Low rehabilitation potential.<br><br>*Several minor and significant current negative ecological impacts.                                                                                                                                        | <b>Low</b>      | <b>Low</b><br>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.                                                                                                     | <b>Medium</b>   | <b>Minimisation and restoration mitigation</b> – medium- to high-impact development activities are acceptable, followed by appropriate restoration activities. |
| Modified Habitat    | <b>Low</b><br>*No confirmed or highly likely populations of SCC. | <b>Very Low</b><br>*Several significant current negative ecological impacts.                                                                                                                                                                                   | <b>Very Low</b> | <b>Very High</b><br>Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality. Species in this habitat have a very high likelihood of returning to a site once the disturbance or impact has been removed. | <b>Very Low</b> | <b>Minimisation mitigation</b> – medium- to high-impact development activities are acceptable, and restoration activities may not be required.                 |
| Secondary Grassland | <b>Low</b><br>*No confirmed or highly likely populations of SCC. | <b>Medium</b><br>*Semi-intact area for any conservation status of ecosystem type.<br><br>*Mostly minor current negative ecological impacts with some significant impacts and a few signs of minor past disturbance.<br><br>*Moderate rehabilitation potential. | <b>Low</b>      | <b>Medium</b><br>Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor. Species in this habitat have a moderate likelihood of returning to a site once the disturbance or impact has been removed.                               | <b>Low</b>      | <b>Minimisation and restoration mitigation</b> – medium- to high-impact development activities are acceptable, followed by appropriate restoration activities. |



## 5 IMPACT ASSESSMENT AND IMPACT STATEMENT

This section provides:

1. A compliance statement confirming the verified low sensitivity of the Plant Species Theme (Section 5.1), in accordance with the GN 1150 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant Species (Government Gazette No. 43855 of 30 October 2020, as amended by GN 3717 of 2023); and
2. A comprehensive impact assessment and discussion on potential residual impacts informing the Terrestrial Biodiversity Theme (Section 5.2 & 5.3), in accordance with the GN 320 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity as published in Government Gazette 43110 dated 20 March 2020.

The proposed project footprint is confined to the delineated study area of approximately 102 ha.

### 5.1 Plant Species Compliance Statement

The triggered screening tool species, namely *Melolobium subspicatum* (VU) and Sensitive species 1248 (VU), were not present within the study area. These species are also not anticipated to occur within the study area as the vegetation and habitat conditions are not considered suitable. Table 7 presents an overview of the SCCs triggered by the screening tool, along with species provided by GDARDE that have previously been recorded within 5 - 20 km of the study area.

**Table 7: Floral SCC that may occur within the study area (including POC calculations).**

| Scientific Name                                       | Threat Status (National) | Suitable Habitat                                                                                                                                                                                                        | POC | Motivation for disputing the presence of the triggered species                                                                               |
|-------------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Bowiea volubilis</i> subsp. <i>volubilis</i>       | VU                       | Shady places, steep rocky slopes and in open woodland, under large boulders in bush or low forest. This subspecies is under severe pressure from medicinal plant harvesting over most of its range in South Africa.     | Low | No steep rocky slopes or open woodlands in the study area, nor any large boulders in the bush or low forest that would support this species. |
| <i>Cheilanthes deltoidea</i> subsp. <i>silicicola</i> | VU                       | Southwest-facing soil pockets and rock crevices in chert rock. Subpopulations were recently discovered between Centurion and Irene in Gauteng that differ markedly in morphology and habitat from other subpopulations. | Low | No southwest-facing soil pockets or rock crevices that could support the species.                                                            |



| Scientific Name                       | Threat Status (National) | Suitable Habitat                                                                                                                                                                                   | POC    | Motivation for disputing the presence of the triggered species                                                                                                                                |
|---------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Cineraria austrotransvaalensis</i> | NT                       | Amongst rocks on steep slopes of hills and ridges, as well as at the edge of thick bush or under trees; on all aspects and on a range of rock types: quartzite, dolomite and shale; 1400 – 1700 m. | Low    | No rocky environment for the species to grow in.                                                                                                                                              |
| <i>Cleome conrathii</i>               | NT                       | Stony quartzite slopes, usually in red sandy soil, grassland or open to closed deciduous woodland, all aspects.                                                                                    | Low    | The study area is not associated with stony quartzite slopes, nor red sandy soil, nor open to closed deciduous woodlands.                                                                     |
| <i>Delosperma leendertziae</i>        | NT                       | Rocky ridges; on rather steep south facing slopes of quartzite in mountain grassveld.                                                                                                              | Low    | No rocky ridges are associated with the study area.                                                                                                                                           |
| <i>Dicliptera magaliesbergensis</i>   | VU                       | Forest, savanna (Riverine Forest and bush).                                                                                                                                                        | Low    | No suitable wooded habitat for this species is associated with the study area.                                                                                                                |
| <i>Drimia sanguinea</i>               | NT                       | Open veld and scrubby woodland in a variety of soil types.                                                                                                                                         | Medium | Habitat possibly suitable, but the disturbed conditions and already lack of forbs within the study area render this species highly unlikely to be present or to establish viable populations. |
| <i>Habenaria barbertoni</i>           | NT                       | In grassland on rocky hillsides.                                                                                                                                                                   | Low    | No rocky hillsides within the study area that could support this species.                                                                                                                     |
| <i>Habenaria kraenzliniana</i>        | NT                       | Terrestrial in stony, grassy hillsides, recorded from 1000 to 1400m.                                                                                                                               | Low    | No rocky hillsides within the study area that could support this species.                                                                                                                     |
| <i>Habenaria mossii</i>               | EN                       | Open grassland on dolomite or in black sandy soil.                                                                                                                                                 | Low    | No suitable habitat within the study area.                                                                                                                                                    |
| <i>Holothrix randii</i>               | NT                       | Grassy slopes and rock ledges, usually southern aspects.                                                                                                                                           | Low    | No prominent rock ledges within the study area that could support this species.                                                                                                               |
| <i>Khadia beswickii</i>               | VU                       | Open areas on shallow surfaces over rocks in grassland.                                                                                                                                            | Low    | The site was not rocky and this species, therefore, is unlikely to be present in the study area.                                                                                              |



| Scientific Name                                                             | Threat Status (National) | Suitable Habitat                                                                                                                                                                          | POC | Motivation for disputing the presence of the triggered species                   |
|-----------------------------------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------------|
| <i>Lithops lesliei</i> subsp. <i>lesliei</i> ; & subsp. <i>rubrobrunnea</i> | NT                       | Primary habitat appears to be the arid grasslands in the interior of South Africa where it usually occurs in rocky places, growing under the protection of surrounding forbs and grasses. | Low | No prominent rocky places within the study area that could support this species. |
| <i>Melolobium subspicatum</i>                                               | VU                       | A rare and localised species endemic to Gauteng Province in South Africa. It grows exclusively in grassland on dolomite and is known from only three localities.                          | Low | Outside of the known localities.                                                 |

The proposed development of the Vorna Valley Spark School is in an area where no threatened plant species are present, and none are anticipated, given the absence of suitable habitat for such species. The proposed activities will therefore not impact any SCCs, and no mitigation measures related to SCCs are required. However, general mitigation measures related to vegetation integrity and terrestrial biodiversity, relevant to the broader ecological impacts of the proposed development, are addressed in Section 5.2 & 5.3.

## 5.2 Terrestrial Biodiversity Theme Impact Assessment

The sections below outline the significance of the perceived impacts arising from the proposed activities within the study area, as described in Part A.

Sections 5.2 and 5.3 present the assessment and discussion of potential impacts across the i) pre-construction, ii) construction, and iii) operation and maintenance phases. All mitigation measures required to minimise these impacts are provided in Section 5.2. Table 8 outlines the perceived risks to floral species linked to the proposed developments.

**Table 8: Activities and Aspects likely to impact on the floral resources of the study area.**

| ACTIVITY AND IMPACT PHASES    | IMPACT DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Pre-Construction Phase</b> | <ul style="list-style-type: none"> <li>➤ Inappropriate timing of vegetation clearance during peak growing or flowering seasons may increase impacts on indigenous flora and reduce rehabilitation success.</li> <li>➤ Inadequate planning, infrastructure placement, or survey timing may lead to the avoidable loss of Freshwater Habitat and the associated (verified) ESA, as well as increase edge effects on habitats outside the approved development footprint.</li> <li>➤ A poorly developed stormwater management plan at design stage may fail to account for post-development hydrology, resulting in future erosion, altered surface runoff patterns, and downstream sedimentation, ultimately reducing the quality and extent of remaining natural areas.</li> <li>➤ The use of existing wetland (i.e., Freshwater Habitat) crossings as part of the proposed layout presents a risk of avoidable wetland degradation if upgrades are not informed by site-specific hydrological and ecological assessments, potentially resulting in unnecessary loss of wetland function, increased fragmentation, and reduced or degraded ESA functions (e.g. surface water conveyance, ecological connectivity, and sediment retention).</li> <li>➤ Failure to identify or relocate provincially protected plant species prior to construction.</li> </ul> |



|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                           | <ul style="list-style-type: none"> <li>➤ Lack of pre-construction permitting (e.g., GDARDE flora permits) for the removal, destruction, or translocation of protected species may lead to non-compliance and avoidable biodiversity loss.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Construction Phase</b>                 | <p><b>Vegetation clearance and direct habitat loss</b></p> <ul style="list-style-type: none"> <li>➤ Site clearing and vegetation removal will directly result in the loss of natural habitat and may eliminate individuals of common species.</li> <li>➤ Inadequate layout optimisation or poor footprint control during earthworks may result in clearing that exceeds the authorised footprint, causing unnecessary loss of natural vegetation and increasing edge effects.</li> <li>➤ Failure to carry out rescue and relocation of protected flora individuals immediately before vegetation clearing, following the approved method and permit requirements, may result in the loss of protected species.</li> </ul> <p><b>Encroachment into sensitive habitats (buffers and no-go areas)</b></p> <ul style="list-style-type: none"> <li>➤ Incorrectly demarcated or poorly maintained environmental buffers (e.g. wetland buffers and “no-go” areas) may allow machinery, stockpiles, lay-down areas, informal tracks, and worker movement to unintentionally encroach into Freshwater Habitat (i.e. ESA habitat).</li> <li>➤ An increased human presence may result in opportunistic collection, removal, or trampling of indigenous flora.</li> <li>➤ Informal footpaths created by construction personnel or subsequent site users may result in trampling of indigenous vegetation, soil compaction, and progressive widening of disturbance into buffer and ESA areas.</li> </ul> <p><b>AIP introduction and spread</b></p> <ul style="list-style-type: none"> <li>➤ Introduction of plant pathogens or AIP propagules through contaminated equipment or soil, with spread via machinery, soil disturbance, temporary stockpiles, or dumped materials, outcompeting indigenous flora.</li> <li>➤ Failure to implement the AIP Management Plan across all construction zones may lead to rapid proliferation of AIPs associated with soil movement, disturbed substrates, and construction activities.</li> <li>➤ Poorly designed or incorrectly implemented landscaping plans, particularly those reliant on non-native species, may further reduce indigenous biodiversity and create conditions favourable to AIP establishment.</li> <li>➤ Disturbance corridors left unrehabilitated may become pathways for AIP invasion, further altering habitat integrity and reducing ecological functionality within ESA and adjacent habitats.</li> </ul> <p><b>Edge effects, soil disturbance, and degradation of habitat integrity</b></p> <ul style="list-style-type: none"> <li>➤ Poorly managed edge effects, including excessive disturbance, dust deposition, AIP spread, and soil compaction, may substantially reduce habitat integrity adjacent to the development footprint.</li> <li>➤ Poor edge management may result in erosion, gully, or sedimentation, particularly where soils remain exposed or compacted, while inadequate rehabilitation of disturbed areas reduces vegetation cover and compromises soil stability.</li> </ul> <p><b>Habitat fragmentation and ecological connectivity</b></p> <ul style="list-style-type: none"> <li>➤ Habitat fragmentation associated with road crossings and the proposed school development may locally reduce ecological connectivity and compromise ESA functioning, particularly within freshwater-linked habitats.</li> </ul> |
| <b>Operational and Maintenance Phases</b> | <ul style="list-style-type: none"> <li>➤ Permanent transformation of floral habitat may occur where post-construction rehabilitation is inadequate or fails to establish a stable indigenous vegetation cover, leading to persistent bare patches, soil disturbance, and reduced ecological function.</li> <li>➤ Poorly controlled AIP re-establishment may continue to degrade natural vegetation surrounding the development.</li> <li>➤ Long-term erosion and stormwater-related degradation may occur where stormwater systems are undersized, poorly maintained, or fail to include appropriate energy dissipation structures (e.g., berms, contour trenches, dissipaters). Concentrated runoff may cause gully, channel incision, or sedimentation in wetlands, leading to irreversible habitat loss.</li> <li>➤ Poor maintenance of stormwater culverts, drains, and retention structures may result in the alteration of natural hydrological processes. This may cause wetland desiccation, prolonged waterlogging, or localised flooding, all of which degrade floral habitat and contribute to long-term fragmentation, particularly within ESA habitat.</li> <li>➤ Continued human presence within the development may lead to opportunistic removal or harvesting of indigenous flora (including medicinal species, geophytes, and protected species), contributing to declining species diversity and further habitat degradation.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |



### 5.2.1 Terrestrial Biodiversity Impact Tables

Tables 9 - 11 indicate the perceived risks to the floral ecology associated with all phases of the proposed development. The tables also present the findings of the impact assessment undertaken on the perceived impacts before and after the implementation of mitigation measures. Key integrated mitigation measures for the proposed project are presented in the tables below and are required to effectively manage and mitigate the ecological impacts associated with all phases of the proposed activities.

The mitigated results of the impact assessment have been calculated on the premise that all mitigation measures as stipulated in this report are adhered to and implemented. Should such actions not be adhered to, post-mitigation impact scores will likely increase.

The impact assessment distinguishes between impact categories, namely 1) impact on floral habitat and diversity (both direct and indirect impacts considered) and 2) impacts on floral SCCs and/or their associated habitat, as well as 3) ecological connectivity and ecosystem services.



**Table 9: Planning Phase impacts** on the floral habitat, diversity, and significant biodiversity features from the proposed development activities. Required mitigation measures are presented at the bottom of the table.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Probability | Sensitivity | Severity | Spatial Scale | Duration | Likelihood | Consequence | Significance   | Probability | Sensitivity | Severity | Spatial Scale | Duration | Likelihood | Consequence | Significance   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|----------|---------------|----------|------------|-------------|----------------|-------------|-------------|----------|---------------|----------|------------|-------------|----------------|
| Freshwater Habitat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3           | 3           | 3        | 3             | 2        | 6          | 8           | 48<br>Low      | 1           | 3           | 2        | 2             | 1        | 4          | 5           | 20<br>Very low |
| Modified Habitat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 3           | 1           | 1        | 1             | 2        | 4          | 4           | 16<br>Very low | 1           | 1           | 1        | 1             | 1        | 2          | 3           | 6<br>Very low  |
| Secondary Grassland                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3           | 2           | 2        | 1             | 2        | 5          | 5           | 25<br>Very low | 1           | 2           | 2        | 1             | 1        | 3          | 4           | 12<br>Very low |
| Protected flora                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3           | 2           | 2        | 2             | 1        | 5          | 5           | 25<br>Very low | 2           | 2           | 1        | 1             | 1        | 4          | 3           | 12<br>Very low |
| <b>Mitigation Measures for perceived impacts on habitat and species diversity</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |             |             |          |               |          |            |             |                |             |             |          |               |          |            |             |                |
| <ul style="list-style-type: none"> <li>➤ Ensure sound environmental management is implemented at all times during the pre-construction phase, including active supervision by an Environmental Control Officer (ECO) or suitably qualified environmental professional.</li> <li>➤ Minimise loss of natural vegetation through effective planning: <ul style="list-style-type: none"> <li>○ Restrict the development footprint strictly to approved areas;</li> <li>○ Where possible, minimise impervious surfaces to reduce habitat loss and increase on-site stormwater infiltration; and</li> <li>○ Ensure layout designs comply with all relevant legislation, and take reasonable precautions to prevent spills, leaks, or other contamination.</li> </ul> </li> <li>➤ An AIP Management/Control Plan should be compiled by a qualified professional and implemented prior to construction activities. No uncertified chemical control of AIPs to occur without a trained professional, nor within or close to the Freshwater Habitat.</li> <li>➤ Erosion and stormwater control: design appropriate rehabilitation<sup>11</sup> measures, erosion control, and stormwater management at all times to prevent habitat degradation during the construction and operational phases.</li> <li>➤ Conduct pre-construction floral walkdowns during peak flowering/seed-setting seasons, where feasible, to identify all TNCO-protected plant species requiring permitting, relocation, or avoidance.</li> <li>➤ Where feasible, minimise fragmentation during the design phase by clustering development and limiting linear infrastructure through natural habitat patches.</li> </ul> |             |             |          |               |          |            |             |                |             |             |          |               |          |            |             |                |

<sup>11</sup> Rehabilitation in this context refers to surface stabilisation, erosion control, and the re-establishment of a basic indigenous groundcover to prevent further degradation and AIP species establishment, rather than full ecological restoration.



**Table 10: Construction Phase impacts on the floral habitat, diversity, and significant biodiversity features from the proposed development activities. Required mitigation measures are presented at the bottom of the table.**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Probability | Sensitivity | Severity | Spatial Scale | Duration | Likelihood | Consequence | Significance     | Probability | Sensitivity | Severity | Spatial Scale | Duration | Likelihood | Consequence | Significance     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|----------|---------------|----------|------------|-------------|------------------|-------------|-------------|----------|---------------|----------|------------|-------------|------------------|
| Freshwater Habitat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 5           | 3           | 2        | 3             | 4        | 8          | 9           | 72<br>Medium-low | 5           | 3           | 1        | 2             | 4        | 8          | 7           | 56<br>Medium-low |
| Modified Habitat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 5           | 1           | 2        | 2             | 4        | 6          | 8           | 48<br>Low        | 5           | 1           | 1        | 1             | 4        | 6          | 6           | 36<br>Low        |
| Secondary Grassland                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 5           | 2           | 2        | 2             | 4        | 7          | 8           | 56<br>Medium-low | 5           | 2           | 1        | 1             | 4        | 7          | 6           | 42<br>Low        |
| Protected flora                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 5           | 2           | 2        | 1             | 4        | 7          | 7           | 49<br>Low        | 2           | 2           | 2        | 1             | 2        | 4          | 5           | 20<br>Very low   |
| Habitat Connectivity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 5           | 3           | 2        | 2             | 4        | 8          | 8           | 64<br>Medium-low | 5           | 3           | 2        | 1             | 4        | 8          | 7           | 56<br>Medium-low |
| ESA degradation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 5           | 3           | 3        | 2             | 4        | 8          | 9           | 72<br>Medium-low | 3           | 3           | 2        | 2             | 4        | 6          | 8           | 48<br>Low        |
| <b>Mitigation Measures for perceived impacts on habitat and species diversity</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |             |             |          |               |          |            |             |                  |             |             |          |               |          |            |             |                  |
| <ul style="list-style-type: none"> <li>➤ Removal of vegetation must be restricted to what is absolutely necessary and should remain within the approved development footprint – manage footprint creep to surrounding areas.</li> <li>➤ Clearly demarcate all construction areas and regularly inspect boundaries to prevent footprint creep into surrounding natural habitats.</li> <li>➤ Construction rubble and/or cleared alien vegetation must be disposed of in a sustainable and environmentally responsible manner; no material is to be left on site or in the surrounding natural habitat.</li> <li>➤ A rehabilitation plan must be prepared and implemented, and all rehabilitation actions adhered to, mitigating edge effects on the receiving environment.</li> <li>➤ Ensure no unnatural preferential flow paths are created; implement appropriate stormwater management and erosion prevention.</li> <li>➤ All areas outside of the planned footprint impacted by construction must be rehabilitated and reseeded with an indigenous seed mix.</li> <li>➤ Manage the spread of AIP species to prevent colonisation of remaining natural habitat.</li> <li>➤ To prevent indirect impacts on vegetation integrity (e.g. fire damage, soil compaction), vehicles must be restricted to designated roadways.</li> <li>➤ No collection of indigenous floral species by construction personnel.</li> <li>➤ Stockpiled topsoil must be kept free of AIPs and stored in a manner that preserves the indigenous soil seed bank, where applicable.</li> <li>➤ Spills must be cleaned up immediately; spill kits should be kept on-site; vehicle maintenance to prevent hydrocarbon ingress into soil.</li> <li>➤ No illicit fires permitted during construction.</li> <li>➤ Retain and protect wetland buffers to maintain hydrological functions, flood attenuation, and habitat connectivity.</li> <li>➤ Monitor edge effects to ensure connectivity is not compromised; rehabilitate disturbed areas and prevent the spread of AIPs.</li> <li>➤ TNCO-protected species that were marked during site walkdowns must be relocated to suitable areas prior to the commencement of construction activities (unless destruction permits are granted); relocated species must be monitored for up to three years or until successful establishment has been demonstrated.</li> </ul> |             |             |          |               |          |            |             |                  |             |             |          |               |          |            |             |                  |



**Table 11: Operation and Maintenance Phase impacts** on the floral habitat, diversity, and significant biodiversity features from the proposed development activities. Required mitigation measures are presented at the bottom of the table.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Probability | Sensitivity | Severity | Spatial Scale | Duration | Likelihood | Consequence | Significance     | Probability | Sensitivity | Severity | Spatial Scale | Duration | Likelihood | Consequence | Significance   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|----------|---------------|----------|------------|-------------|------------------|-------------|-------------|----------|---------------|----------|------------|-------------|----------------|
| Freshwater Habitat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3           | 3           | 3        | 3             | 4        | 6          | 10          | 60<br>Medium-low | 3           | 3           | 2        | 2             | 4        | 6          | 8           | 48<br>Low      |
| Modified Habitat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2           | 1           | 1        | 1             | 4        | 3          | 6           | 18<br>Very low   | 1           | 1           | 1        | 1             | 4        | 2          | 6           | 12<br>Very low |
| Secondary Grassland                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 4           | 2           | 2        | 1             | 4        | 6          | 7           | 42<br>Low        | 3           | 2           | 2        | 1             | 4        | 5          | 7           | 35<br>Low      |
| Protected flora                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 3           | 2           | 2        | 2             | 4        | 5          | 8           | 40<br>Low        | 2           | 2           | 1        | 1             | 4        | 4          | 6           | 24<br>Very low |
| <b>Mitigation Measures for perceived impacts on habitat and species diversity</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |             |             |          |               |          |            |             |                  |             |             |          |               |          |            |             |                |
| <ul style="list-style-type: none"> <li>➤ No dumping of litter or construction material on-site or within surrounding natural habitats.</li> <li>➤ Strictly manage edge effects arising from the development, such as erosion, soil compaction, and the proliferation of AIPs, to minimise impacts on adjacent natural areas. Particular attention should be given to AIPs listed in the NEMBA Alien Species Lists (2020) in accordance with the NEMBA Alien and Invasive Species Regulations (2020).</li> <li>➤ Implement ongoing AIP monitoring and control throughout the operational and maintenance phase, with a focus on roads, open spaces, and landscaped areas where AIPs could spread into adjacent natural habitats.</li> <li>➤ Landscaping within the development footprint must prioritise locally indigenous plant species and avoid species listed under NEMBA or known to be invasive in the region.</li> <li>➤ Irrigation practices must be managed to prevent artificial wetting of adjacent natural habitats, which may promote AIP establishment.</li> <li>➤ Maintain buffer zones around sensitive habitats, including Freshwater Habitat and ESA habitats, to preserve vegetation structure and ecological function.</li> <li>➤ Prohibit the collection or removal of protected species within adjacent natural habitats outside of the development footprint.</li> <li>➤ Monitor relocated species for a minimum of three years, or until establishment is confirmed; and</li> <li>➤ Compile and submit SCC monitoring reports.</li> </ul> |             |             |          |               |          |            |             |                  |             |             |          |               |          |            |             |                |



## 5.2.2 Impact Assessment Discussion

The proposed activities will result in the loss of floral habitat, primarily impacting habitats of low and very low SEI, with restricted impacts expected on habitats of medium SEI. The sections below provide a detailed discussion of the impact assessment outcome.

### 5.2.2.1 Impacts on Floral Diversity and Habitat Integrity

The impact assessment indicates that the proposed development will result in predominantly **medium-low to low significance negative impacts** on biodiversity receptors, with very low residual impacts in some cases following mitigation. Higher-sensitivity receptors, particularly the Freshwater Habitat and ESA components, exhibit greater pre-mitigation significance; however, these impacts are reduced to acceptable levels through the application of the mitigation hierarchy. Where feasible, impacts on Freshwater Habitat and associated ESA components will be avoided through layout optimisation and the use of existing disturbed crossings, with disturbance limited to what is strictly necessary.

Most of the impacts therefore occur within areas classified as low to very low SEI, i.e., habitat that is not floristically important. These include impacts on Modified Habitats, Secondary Grassland, protected flora (where present at low incidence), and habitat connectivity, which are generally assessed as **low to medium-low significance**, reflecting their reduced ecological sensitivity. These impacts are readily manageable through footprint control, avoidance where feasible, and rehabilitation. In accordance with the applicable SANBI development guidelines, medium- to high-impact development activities are acceptable within low and very low SEI areas, provided that appropriate minimisation measures are implemented. In the case of very low SEI habitats, restoration may not be required, although basic site stabilisation and rehabilitation remain good practice.

The development or upgrading of road crossings over the Freshwater Habitat will result in limited impacts on medium-SEI habitats. For medium-SEI habitats, the guidelines require a stronger application of the mitigation hierarchy, with an emphasis on impact minimisation during construction and operation, followed by appropriate restoration activities to reinstate ecological function where disturbance is unavoidable. Given the association with a watercourse, it will be important to implement the recommended mitigation measures as proposed by the appointed Freshwater Ecologist to ensure no significant impacts to the Freshwater Habitat and associated ESA functions.

Overall, the significance ratings indicate that the proposed development is acceptable from a biodiversity perspective, provided effective mitigation and monitoring are implemented.



#### **5.2.2.2 Impacts on Floral SCC: TNCO-protected species**

No TNCO-protected species were recorded during the site assessment, and, if present, such species are unlikely to constitute large populations. Nevertheless, species from the genera *Eucomis*, *Gladiolus*, and *Kniphofia* may occupy sections of the Secondary Grassland and Freshwater Habitat within the study area, and since these are protected by the TNCO, a walkdown of the site will be required prior to vegetation clearance. This necessitates walkdowns during the summer when these species are more easily detectable. Permits to remove, harm, or destroy species on the TNCO list will require permits from the GDARDE.

#### **5.2.2.3 Impact on CBAs, ESAs, Threatened Vegetation and Protected Areas**

The proposed project activities will not impact threatened ecosystems or CBAs. However, the proposed development may affect the ESA associated with the Freshwater Habitat. The impact is limited to upgrading road crossings, which, if properly undertaken, will result in limited fragmentation of ESA habitat and minor effects on ecological processes and drivers within the landscape. With adequate implementation of mitigation measures, the impacts on the ESA habitat will be of low significance, an acceptable level, and will not result in any significant negative residual impacts on the ESA or the functions it provides.

#### **5.2.2.4 Probable Residual Impacts**

No significant negative residual impacts on terrestrial biodiversity have been identified for the proposed project. However, even with extensive mitigation, residual impacts on the receiving floral ecological environment are possible. The residual impacts listed below represent worst-case outcomes should mitigation measures not be fully implemented or maintained:

- Permanent loss of and altered floral species diversity;
- Edge effects such as further habitat fragmentation and ongoing AIP proliferation; and
- Disturbed areas not rehabilitated to an ecologically functioning state, with resulting loss of floral habitat, species diversity, and protected floral species, likely to be permanent.

#### **5.2.2.5 Cumulative Impacts**

To assess potential cumulative impacts on vegetation and plant species associated with the proposed activities, consideration was given to past, present, and future (known) projects and natural drivers that affect these aspects. Two areas of concern were identified:

- Habitat fragmentation: The proposed project will result in landscape fragmentation; however, movement corridors will not be entirely impeded; and



- Spread of AIPs: Disturbances associated with construction, edge effects, and inadequate AIP management could contribute to the introduction or spread of AIPs, resulting in a cumulative decline in habitat quality within the study area, as well as along the Freshwater Habitat and downstream habitats.

Given that most of the study area has already undergone substantial modification, significant cumulative impacts are unlikely, with potential cumulative effects largely limited to localised patches of the Freshwater Habitat and downstream natural vegetation. Adequate mitigation, rehabilitation, and long-term management will help ensure that residual cumulative effects remain minor. Given the highly modified urban context and the absence of large, intact natural habitat blocks, cumulative impacts are not expected to operate at a landscape scale.

## 6 CONCLUSION AND RECOMMENDATIONS

The proposed project activities are not expected to significantly impact important or sensitive floral resources. In terms of both the Plant Species Theme and Terrestrial Biodiversity Theme, the impact on flora is expected to be medium-low to very low. Consequently, the specialist believes that the project can be approved from a strictly botanical and terrestrial biodiversity standpoint. In summary, the proposed development is considered acceptable from a terrestrial floral biodiversity perspective, provided that the recommended mitigation, monitoring, and rehabilitation measures are implemented and maintained.

This study provides the relevant information necessary to implement Integrated Environmental Management (IEM) and ensure the optimal long-term use of ecological resources in the study area, in support of the principle of sustainable development. The findings, results, observations, conclusions, and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information.



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## APPENDIX A: Floral Method of Assessment

The methods outlined in this document are aligned with the assessment guidelines provided by the South African National Biodiversity Institute (SANBI) (SANBI, 2020). SANBI is the regulatory body within South Africa that is responsible for ensuring sustainable development through facilitating access to biodiversity data, generating information and knowledge, building capacity, providing policy advice, and showcasing and conserving biodiversity in respective botanical and zoological gardens.

As the regulatory body for biological data, SANBI provides assessment and reporting protocols. These protocols provide a minimum set of assessment and reporting criteria that must form the basis of specialist investigations required for many of the country's environmental processes. As such, the proposed methodology, as described below, is in accordance with in-country standardised field assessment methodologies.

### ***Vegetation Surveys***

Various field sampling methods are available for the purpose of collecting floristic data. Generally, the selection of chosen field methods is dependent on several factors, including the size of the area to be assessed, the heterogeneity of the vegetation/habitat present, time and budget allocated for field assessments, the scale and magnitude of potential project impacts, and the scope of work to be assessed.

When planning the timing of a floristic survey, it is important to remember that the primary objective is not an exhaustive species list but rather to ensure that sufficient data are collected to describe all the vegetation communities present in the area of interest, to optimise the detection of SCC and to assess habitat suitability for other potentially occurring species of conservation concern (SCC) (SANBI, 2020). An understanding of the location and extent of vegetation types of increased sensitivity, and the location of areas of increased importance for various species of SCC, will focus efforts for the identification and marking of SCC during detailed pre-construction walkdown efforts.

Given the restricted time frames in which the proposed field surveys need to be conducted and the combined objective of accurately demarcating sensitive habitats within the area of interest, the method chosen needs to allow for:

- I. Rapid, accurate data collection; and
- II. The optimisation of time spent in habitats that are likely to sustain SCC.

Several survey methods, known as rapid biological assessments (Larsen, 2016)<sup>12</sup>, can be employed. Example of rapid biological assessments include plot-based assessments or transect-based assessments. SANBI (2020) recommends the use of a transect-based approach, namely timed-meander searches (TMS; Goff et al., 1982<sup>13</sup>). The vegetation surveys presented below are a modified version of the TMS methods (hereafter referred to as modified-meander searches (MMS)). The TMS and MMS are subjective sampling methods which employs techniques where the specialist chooses specific sample sites within the area of interest, based on their professional experience in the area and background research done prior to the site visit. This allows representative recordings of floral communities and optimal detection of SCC.

The difference in the TMS and MMS is that the MMS is not timed. The below list presents the reasons for selection of a modified approach:

- Time, access, and safety constraints are often unpredictable and cannot be planned for prior to a site assessment, especially within remote areas and areas where local communities may not provide consent to specialist to survey their lands. As such, a timed approach may result in disproportionate efforts in some pre-defined habitats.

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<sup>12</sup> Larsen, T.H. ed., 2016. Core standardized methods for rapid biological field assessment. Conservation International.

<sup>13</sup> Goff, F.G., Dawson, G.A. and Rochow, J.J., 1982. Site examination for threatened and endangered plant species. *Environmental Management*, 6(4), pp.307-316.

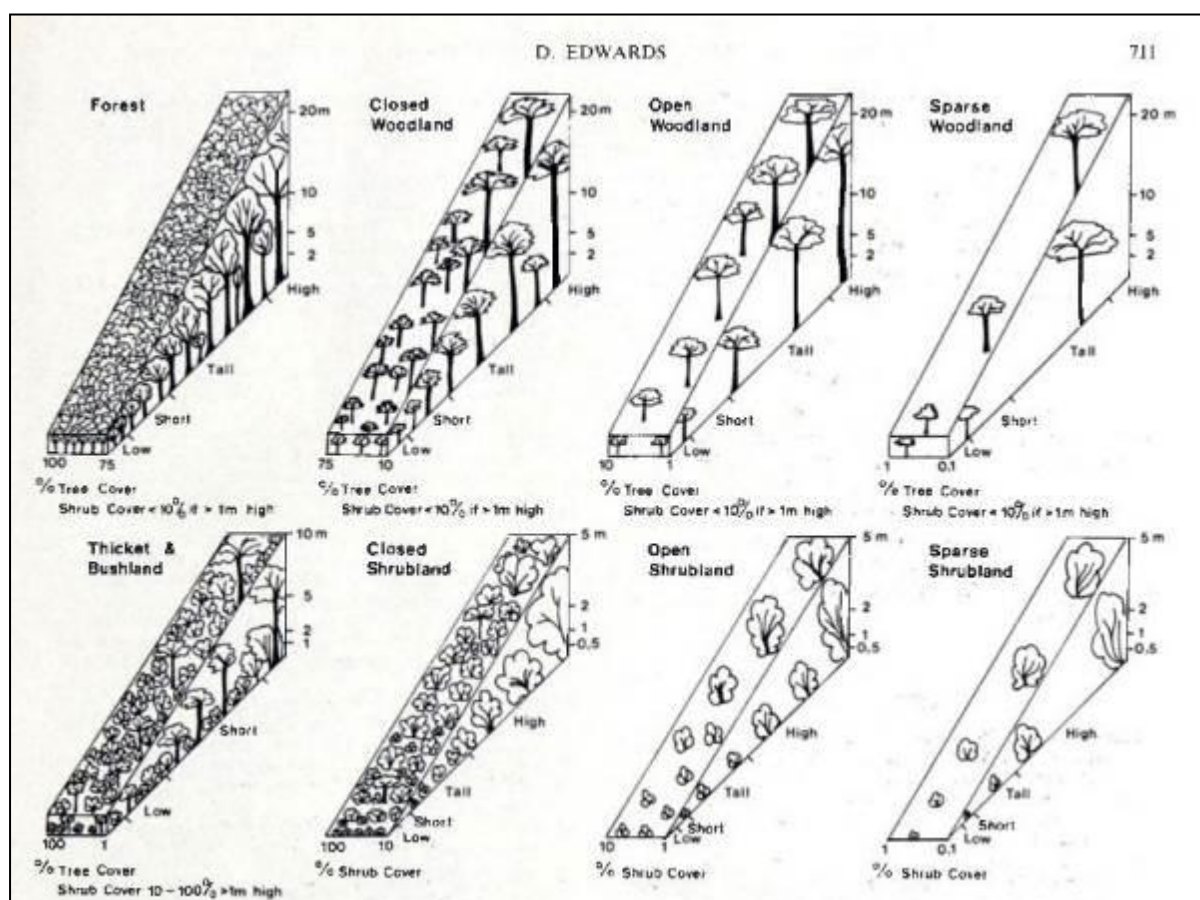


- Vegetation surveys are conducted at the same time as the SCC assessments which limits the potential for timed assessments as SCC often occur either sporadically, or are difficult to detect and hence, longer surveys in certain areas are necessary (skewing the timed approach). Micro habitats where SCC are often found, are often difficult to detect on digital satellite imagery. As such, timing the surveys according to unverified field data will increase the risk of overlooking importance SCC data or habitat integrity features.
- Subjective decisions need to be made on-site that would otherwise interfere with a times-meander approach.

The employment of the presented field methods is beneficial because they allow for rapid data collection and subjective placement (based on professional experience and previous fieldwork knowledge) of the MMSs in habitats that have a higher likelihood of sustaining SCC. Furthermore, this method allows for extensive coverage of the subject property, thus increasing the probability of SCC and micro habitat detection. Extensive coverage of the area of interest will also be advantageous where properties are of large extents that need to be assessed.

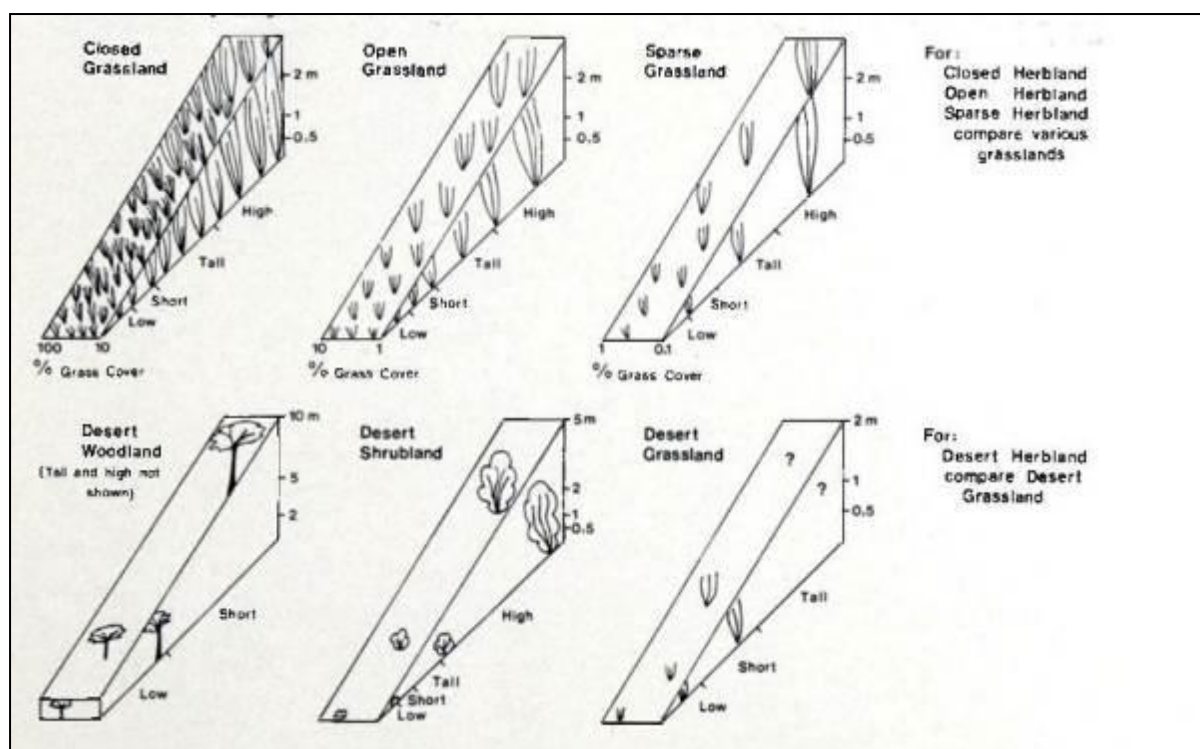
Based on the broad habitat units delineated before going to site and the pre-identified points of interest, which is updated based on on-site observations and access constraints, the selected sample areas are surveyed on foot, following the subjective MMT, to identify the occurrence of the dominant plant species and habitat diversities, but also to detect SCC which tend to be sparsely distributed. Photographs are taken of each vegetation community that is representative of typical vegetation structure of that community, as well as photos of all detected SCC (sensitive species will not be presented in the report).

Vegetation structure has been described following the guideline in Edwards (1983). Refer to Figure A1 below:



**Figure A1: Diagrammatic representation of structural groups and formation classes. Only dominant growth forms are shown.**





**Figure A1 (continued): Diagrammatic representation of structural groups and formation classes. Only dominant growth forms are shown.**

## Floral Species of Conservation Concern Assessment

Prior to the site visit, a record of floral SCC and their habitat requirements was developed for the study area, which includes consulting the National Web-based Environmental Screening Tool. Because not all SCC have been included in the Screening Tool layers (e.g., near-threatened (NT) and Data Deficient (DD) taxa), it remains important for the specialist to be on the lookout for additional SCC. For this study, two several sources were consulted and are described below.

### The National Web-Based Environmental Screening Tool

The Screening Tool was accessed to obtain a list of potentially occurring species of conservation concern for the study area. Each of the themes in the Screening Tool consists of theme-specific spatial datasets which have been assigned a sensitivity level namely, “low,” “medium,” “high” and “very high” sensitivity. The four levels of sensitivity are derived and identified in different ways, e.g., for **confirmed** areas of occupied habitat for SCC a Very High and High Sensitivity is assigned and for areas of suitable habitat where SCC may occur based on spatial models only, a Medium Sensitivity is assigned. The different sensitivity ratings pertaining to the Plant [and Animal] Protocols are described below<sup>14</sup>:

- **Very High:** Habitat for species that are endemic to South Africa, where all the known occurrences of that species are within an area of 10 square kilometres (km<sup>2</sup>) are considered Critical Habitat, as all remaining habitat is irreplaceable. Typically, these include species that qualify under Critically Endangered (CR), Endangered (EN), or Vulnerable (VU) D criteria of the IUCN or species listed as Critically/ Extremely Rare under South Africa’s National Red

<sup>14</sup> More details on the use of the Screening Tool for Species of Conservation Concern can be found in the below resources:

- South African National Biodiversity Institute (SANBI). 2020. Draft Species Environmental Assessment Guideline. Guidelines for the implementation of the Terrestrial Flora (3c) & Terrestrial Fauna (3d) Species Protocols for environmental impact assessments in South Africa. South African National Biodiversity Institute, Pretoria. Version 1.0.
- The National Web based Environmental Screening Tool website: <https://screening.environment.gov.za/screeningtool/#/pages/welcome>



List Criteria. For each species reliant on a Critical Habitat, all remaining suitable habitat has been manually mapped at a fine scale.

- **High:** Recent occurrence records for all threatened (CR, EN, VU) and/or rare endemic species are included in the high sensitivity level. Spatial polygons of suitable habitat have been produced for each species by intersecting recently collected occurrence records (those collected since the year 2000) that have a spatial confidence level of less than 250 metre (m) with segments of remaining natural habitat.
- **Medium:** Model-derived suitable habitat areas for threatened and/or rare species are included in the medium sensitivity level. Two types of spatial models have been included. The first is a simple rule-based habitat suitability model where habitat attributes such as vegetation type and altitude are selected for all areas where a species has been recorded to occur. The second is a species distribution model which uses species occurrence records combined with multiple environmental variables to quantify and predict areas of suitable habitat. The models provide a probability-based distribution indicating a continuous range of habitat suitability across areas that have not been previously surveyed. A probability threshold of 75 percent (%) for suitable habitat has been used to convert the modelled probability surface and reduce it into a single spatial area which defines areas that fall within the medium sensitivity level.
- **Low:** Areas where no SCC are known or expected to occur.

## IUCN RED LIST OF THREATENED SPECIES

The IUCN Red List of Threatened Species (IUCN, 2024), the world's most comprehensive information source on the global conservation status of animal, fungi and plant species, was accessed to obtain a list of all SCCs previously recorded in the area. Using the advanced search option, a list of known SCCs for the area was generated. The IUCN Red List Categories and Criteria are intended to be an easily and widely understood system for classifying species at high risk of global extinction. It divides species into nine categories: Not Evaluated (NE), Data Deficient (DD), Least Concern (LC), Near Threatened (NT), Vulnerable (VU), Endangered (EN), Critically Endangered (CR), Extinct in the Wild (EW) and Extinct (EX).

## iNATURALIST

iNaturalist, a crowdsourced species identification system and an organism occurrence recording tool, was utilised to determine whether any SCCs were recorded within and/or surrounding the study area and to gauge the habitat types in which such species were previously recorded (primarily used before the site assessment as part of field preparation).

## NEMBA TOPS SPECIES

The National Environmental Management: Biodiversity Act, 2004 (Act No.10 of 2004) (NEMBA) Threatened or Protected Species (TOPS) list (Government Gazette [GN] 29657, as amended in GN R1187 in Government Gazette 30568 of 2007).

## LIST OF PROTECTED TREE SPECIES (GOVERNMENT GAZETTE NO. 41887, NOTICE 536 OF 2018) LIST OF PROTECTED TREE SPECIES (GOVERNMENT GAZETTE NO. 41887, NOTICE 536 OF 2018) UNDER THE NATIONAL FORESTS ACT, 1998 (ACT NO. 84 OF 1998) (NFA)

In terms of section 15(1) of the NFA, 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 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. As these species are considered important, listed trees formed part of the SCC assessment.

## GDARD SPECIES STATUS REPORT FOR THE QDS 2528CC

The Gauteng Department of Agriculture and Rural Development (GDARD) provided data on SCC recorded within the QDS 2528CC. This dataset includes confirmed recordings of SCC and provides details of how far from the study area the species were recorded. Exact localities are not provided.



## SPECIALLY PROTECTED AND PROTECTED SPECIES

The Transvaal Nature Conservation Ordinance, 1983 (Ordinance No. 12 of 1983) (TNCO) provides a list of provincially protected plants under Schedule 11 (Protected Plants) and Schedule 12 (Specially Protected Species). These species formed part of the SCC assessment. The list is available online at the following link: <https://cer.org.za/wp-content/uploads/2017/01/North-West-Biodiversity-Management-Act.pdf>

### Determining the likelihood of a species occurring within the assessment area

Throughout the floral assessment, special attention was paid to the identification of any of these SCC as well as the identification of suitable habitat that could potentially support these species.

The Probability of Occurrence (POC) for each floral SCC is described:

- **“Confirmed”**: if observed during the survey;
- **“High”**: if within the species’ known distribution range and suitable habitat is available;
- **“Medium”**: if either within the known distribution range of the species or if suitable habitat is present; or
- **“Low”**: if the habitat is not suitable and falls outside the distribution range of the species.

| Low POC | Medium POC | High POC | Confirmed |
|---------|------------|----------|-----------|
|---------|------------|----------|-----------|

The accuracy of the POC is based on the available knowledge about the species in question, with many of the species lacking in-depth habitat research.

### Consideration and application of the precautionary approach

The precautionary principle is defined by Tickner & Raffensperger (1999) as follows:

*“When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause-and-effect relationships are not fully established scientifically”.*

Given time and resource constraints within the field, it is not always feasible to definitively state the presence or absence of particular Species of Conservation Concern (SCC) or sensitive habitats. In such instances, the precautionary principle should be applied (SANBI, 2020). By applying such principles, preventative action is taken in the face of uncertainty. Furthermore, for cryptic species that are often difficult to detect, it is not always easy to provide undeniable proof that a species occurs within a particular area within a subject property. As such, if a suitable habitat is identified within the subject property and there is potential evidence to suggest the species did or can occur within the subject property (i.e., confirmed sightings in adjacent properties), then the precautionary principle will be to assume that the species does indeed occur within the area of interest. Appropriate mitigation and management efforts would then need to follow accordingly.

## Floral Site Ecological Importance (SEI)

SEI is considered to be a function of the biodiversity importance (BI) of the receptor (e.g., Species of Conservation Concern, the vegetation/fauna community or habitat type present on the site<sup>15</sup>) and its resilience to impacts (receptor resilience [RR]) as follows:

$$SEI = BI + RR$$

SEI can be derived from a simple matrix of BI and RR as follows:

<sup>15</sup> Note that the habitat type may be independent of the vegetation community and that it may even be artificial, e.g., excavated rock quarries that provide crucial breeding habitat for cliff-nesting species such as Bald Ibis.



**Table A1: Matrix of CI and FI to determine BI.**

| Site Ecological Importance (SEI) |           | Biodiversity Importance |           |          |          |          |
|----------------------------------|-----------|-------------------------|-----------|----------|----------|----------|
|                                  |           | Very high               | High      | Medium   | Low      | Very low |
| Receptor Resilience              | Very low  | Very high               | Very high | High     | Medium   | Low      |
|                                  | Low       | Very high               | Very high | High     | Medium   | Very low |
|                                  | Medium    | Very high               | High      | Medium   | Low      | Very low |
|                                  | High      | High                    | Medium    | Low      | Very low | Very low |
|                                  | Very high | Medium                  | Low       | Very low | Very low | Very low |

Interpretation of the SEI in the context of the proposed development is provided below.

**Table A2: Guidelines for interpreting SEI in the context of the proposed development activities.**

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

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

$$BI = CI + FI$$

BI can be derived from a simple matrix of CI and FI as follows:

**Table A3: Matrix of CI and FI to determine BI.**

| Biodiversity importance |           | Conservation importance |           |          |          |          |
|-------------------------|-----------|-------------------------|-----------|----------|----------|----------|
|                         |           | Very high               | High      | Medium   | Low      | Very low |
| Functional Integrity    | Very high | Very high               | Very high | High     | Medium   | Low      |
|                         | High      | Very high               | High      | Medium   | Medium   | Low      |
|                         | Medium    | High                    | Medium    | Medium   | Low      | Very low |
|                         | Low       | Medium                  | Medium    | Low      | Low      | Very low |
|                         | Very low  | Medium                  | Low       | Very low | Very low | Very low |

**Conservation importance (CI)** is evaluated in accordance with recognised established internationally acceptable principles and criteria for the determination of biodiversity-related value, including the IUCN Red List of Species, Red List of Ecosystems and Key Biodiversity Areas (KBA; IUCN [2016]).

Conservation importance is defined here as:

*'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.'*

These criteria are defined as follows:

- IUCN threatened and Near Threatened species (CR, EN, VU and NT) are defined as either the global or national assessments of the risk of extinction as evaluated by a dedicated panel of



species specialists according to the criteria of the International Union for The Conservation of Nature ([www.iucnredlist.org](http://www.iucnredlist.org)). Where the global and national assessments differ for the same taxon, the national evaluation of status<sup>16</sup> should be used in calculating SEI unless the global assessment is both more recent and of a more threatened category. It is important to note that the specialist is required to have a firm understanding of the IUCN Red List Categories and Criteria (IUCN 2012) in order to appropriately apply these for the evaluation of SEI. This criterion can be assessed using confirmed occurrences of species or the suitability of the habitat to support these species. Rare species are those included on South Africa's National Red List as Rare or Critically Rare or Extremely Rare. These are highly restricted species that are currently not declining. However, should any development impact on a population of these species they will immediately qualify under one of the IUCN categories of threat. y Range-restricted species – the presence of terrestrial flora, vertebrate and invertebrate fauna with a global population extent of occurrence (EOO) of 10 000 km<sup>2</sup> or less.

- Globally significant populations of congregatory species – a roughly estimated proportion (%) of the global population of a fauna species that congregate for breeding/feeding/hibernation/other reasons. y Significant areas of threatened vegetation types – this is a function of both the area (size) being considered in relation to the total extent of that vegetation type (i.e., proportion) and how threatened (CR, EN, VU) the vegetation types are.
- Natural processes – natural unmanaged areas with low levels of ecological disturbance have largely intact natural processes such as pollination, seed dispersal and migration, and thus have greater intrinsic conservation importance than those that are modified through ecological disturbance.

While most of the features that will be included in the CI will be provided by the screening tool, it is important to note that CI is evaluated at a much finer spatial scale and based on fieldwork data collection and comprehensive desktop analyses performed by the specialist during the EA process. As a minimum requirement, CI needs to be determined for each identified habitat within the project footprint, but best practice recommendation is that it should be determined for all habitats within the entire PAOI<sup>17</sup>.

Fulfilling criteria to evaluate CI do not rely on a single specific threshold for each of the above defining characteristics but can act in combination or in isolation, providing a more robust evaluation of CI (Table A4). Furthermore, while CI is most likely to be assessed based on data collected during the fieldwork survey, it can also be an assessment of the suitability of the receptor to support populations conforming to the fulfilling criteria. As can be seen from the worked example below, each of these evaluations of the fulfilling criteria demand necessary justification.

**Table A4: Conservation importance (CI) criteria.**

| Conservation importance | Fulfilling criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Very high               | <ul style="list-style-type: none"> <li>- Confirmed or highly likely occurrence of CR, EN, VU or Extremely Rare<sup>18</sup> or Critically Rare<sup>19</sup> species that have a global EOO of &lt; 10 km<sup>2</sup>.</li> <li>- Any area of natural habitat<sup>20</sup> of a CR ecosystem type or large area (&gt; 0.1% of the total ecosystem type extent<sup>21</sup>) of natural habitat of EN ecosystem type.</li> <li>- Globally significant populations of congregatory species (&gt; 10% of global population).</li> </ul> |

<sup>16</sup> <http://speciesstatus.sanbi.org/>. For mammals: <https://www.ewt.org.za/wp-content/uploads/2020/04/2020-updated-2016-Red-List-of-Mammals-of-South-Africa-Lesotho-Swaziland-Summary-Listings.xlsx>; for plants: <http://redlist.sanbi.org>.

<sup>17</sup> Because CI needs to be assigned to a receptor (e.g., the vegetation/fauna community or habitat type), it is customary to use the flora community delineation developed for a PAOI by a botanical specialist. However, such delineation is often too fine scaled to define fauna-specific habitats, which are generally more structural than phytosociological in nature. Where this is the case, the fauna specialist should merge two or more relevant floral communities to correlate with the specific fauna habitat type that is characteristic of a particular taxon assemblage. In certain cases, the faunal specialist will have to demarcate habitats that have not been classified by the botanical specialist; a pertinent example is the presence of cliffs, which are frequently important breeding habitat for some bird SCC.

<sup>18</sup> For butterflies, as per Armstrong *et al.* (2013).

<sup>19</sup> For plants, as per Raimondo *et al.* (2009).

<sup>20</sup> This excludes areas of transformed habitat within a defined ecosystem even if these are partially restored, e.g., Highveld grasslands that have been converted to maize fields and then abandoned so that some form of functional grassland is restored; this is not natural habitat as it does not and will not in the future have species composition representative of the original natural habitat.

<sup>21</sup> This can be calculated from the threatened ecosystem of South Africa shapefile available from the SANBI (current available version 2011: <http://bgis.sanbi.org/Projects/Detail/49>).



| Conservation importance | Fulfilling criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High                    | <ul style="list-style-type: none"> <li>- Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of &gt; 10 km<sup>2</sup>. 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 &lt; 10 000 mature individuals remaining.</li> <li>- Small area (&gt; 0.01% but &lt; 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (&gt; 0.1%) of natural habitat of VU ecosystem type.</li> <li>- Presence of Rare species.</li> <li>- Globally significant populations of congregatory species (&gt; 1% but &lt; 10% of global population).</li> </ul> |
| Medium                  | <ul style="list-style-type: none"> <li>- 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.</li> <li>- Any area of natural habitat of threatened ecosystem type with status of VU.</li> <li>- Presence of range-restricted species.</li> <li>- &gt; 50% of receptor contains natural habitat with potential to support SCC.</li> </ul>                                                                                                                                                                                                                                                   |
| Low                     | <ul style="list-style-type: none"> <li>- No confirmed or highly likely populations of SCC.</li> <li>- No confirmed or highly likely populations of range-restricted species.</li> <li>- &lt; 50% of receptor contains natural habitat with limited potential to support SCC.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Very low                | <ul style="list-style-type: none"> <li>- No confirmed and highly unlikely populations of SCC.</li> <li>- No confirmed and highly unlikely populations of range-restricted species.</li> <li>- No natural habitat remaining.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

**Functional integrity (FI)** of the receptor (e.g., the vegetation/fauna community or habitat type) is defined here as the receptors' current ability to maintain the structure and functions that define it, compared to its known or predicted state under ideal conditions. Simply stated, FI is:

*'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.'*

These criteria can be defined as:

- Connectivity to other natural areas – connectivity, which can also be measured conversely as the degree of habitat fragmentation, refers to how connected habitat patches are to each other, which has a significant influence on numerous ecological processes, such as migration and dispersal opportunities of biota and therefore genetic exchange between populations. Connectivity to other similar habitats becomes more important as the remaining intact and functional area of a habitat decreases, mainly because population sizes decrease and are therefore at greater risk from ecological perturbations and inbreeding effects. The degree of connectivity between habitat patches varies greatly with the dispersal ability of the taxon or taxon group (e.g., fossorial reptiles) in question.
- Degree of current persistent negative ecological impacts – persistent negative impacts such as uncontrolled spread of alien and invasive flora effectively decreases both the remaining intact area and ecosystem functioning of a particular habitat. Persistent ecological disruptors must not include components that landowners are legally obliged to address or that should be addressed as norm for best practice. Wilful neglect of these legal obligations or the presence of invasive alien species that can practically be controlled through management actions should not negatively influence the FI score to a major extent.
- Remaining intact and functional area – the proportion of the receptor that supports natural habitat with intact ecological processes – small areas are less likely to withstand ecological degradation compared to large areas, and the latter are therefore better able to maintain structure and function allowing for intact ecological processes.

Ecological processes can be considered to be mostly intact and functional if the receptor area has low levels of current ecological disruptors, has good connectivity to other areas and is a relatively large area. As for CI, the fulfilling criteria to evaluate FI do not rely on a single specific threshold for each of the above defining characteristics but can act in combination or in isolation (Table A5) and will require justification by the specialist.



**Table A5: Functional integrity (FI) criteria.**

| Functional integrity | Fulfilling criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Very high</b>     | <ul style="list-style-type: none"> <li>- Very large (&gt; 100 ha) intact area for any conservation status of ecosystem type or &gt; 5 ha for CR ecosystem types.</li> <li>- High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches.</li> <li>- No or minimal current negative ecological impacts with no signs of major past disturbance (e.g. ploughing).</li> </ul>                                                                                                                                                       |
| <b>High</b>          | <ul style="list-style-type: none"> <li>- Large (&gt; 20 ha but &lt; 100 ha) intact area for any conservation status of ecosystem type or &gt; 10 ha for EN ecosystem types.</li> <li>- Good habitat connectivity with potentially functional ecological corridors and a regularly used road network between intact habitat patches.</li> <li>- 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.</li> </ul>                                                     |
| <b>Medium</b>        | <ul style="list-style-type: none"> <li>- Medium (&gt; 5 ha but &lt; 20 ha) semi-intact area for any conservation status of ecosystem type or &gt; 20 ha for VU ecosystem types.</li> <li>- Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches.</li> <li>- 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.</li> </ul> |
| <b>Low</b>           | <ul style="list-style-type: none"> <li>- Small (&gt; 1 ha but &lt; 5 ha) area.</li> <li>- 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.</li> <li>- Several minor and major current negative ecological impacts.</li> </ul>                                                                                                                                                                                                                 |
| <b>Very low</b>      | <ul style="list-style-type: none"> <li>- Very small (&lt; 1 ha) area.</li> <li>- No habitat connectivity except for flying species or flora with wind-dispersed seeds.</li> <li>- Several major current negative ecological impacts.</li> </ul>                                                                                                                                                                                                                                                                                                                                                |

Ecological processes can be considered to be mostly intact and functional if the receptor area has low levels of current ecological disruptors, has good connectivity to other areas and is a relatively large area. As for CI, the fulfilling criteria to evaluate FI do not rely on a single specific threshold for each of the above defining characteristics but can act in combination or in isolation (Table 8.2) and will require justification by the specialist (see worked example below).

**Receptor resilience (RR)** is defined here as:

*'The intrinsic capacity of the receptor to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention.'*

The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor (Table A4) and will require justification by the specialist. The specialist needs to bear in mind that resilience will often be linked to a particular disturbance or impact, or even time of year, and needs to be described in relation to these factors. For example, large birds of prey have different levels of resilience to noise disturbance depending on whether they are breeding or not; these species would have low resilience to noise disturbance such as construction of a road adjacent to a nest site during the breeding season but a higher resilience to lodge construction in an area with limited breeding habitat outside of the breeding season.

Receptor resilience needs to be evaluated by the specialist and justification for each evaluation must be provided in the report (see worked example below). Finally, after the successful evaluation of both BI and RR as described above, it is possible to evaluate SEI from the final matrix as follows:

SEI should be described in the above manner for each impact receptor within the area of influence and clearly mapped in relation to the proposed development activities and infrastructure. Interpretation of SEI in the context of the proposed development activities (Table A1) must be provided by the specialist. **It is very important to note that SEI is specific to the proposed development activities and cannot be meaningfully compared between different proposed projects with different associated activities on the same spatial location. However, SEI for the same proposed development with multiple alternative layouts and/or locations may be compared within the same study.**



**Table A6: Resilience criteria.**

| Resilience | Fulfilling criteria                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Very high  | Habitat that can recover rapidly (~ less than 5 years) to restore > 75% <sup>28</sup> 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.                                                                                                                                                                                            |



## APPENDIX B: Floral Species List

**Table B1: Floral species encountered during the field assessment. Alien species observed during the field assessment are indicated with an asterisk (\*). Species protected under the TNCO, NFA, TOPS, or that are threatened are emboldened in the table below.**

| Scientific name                                      | Modified / Transformed | Freshwater Habitat | Secondary Grassland |
|------------------------------------------------------|------------------------|--------------------|---------------------|
| <b>WOODY SPECIES</b>                                 |                        |                    |                     |
| * <i>Acacia</i> sp.                                  | x                      | x                  |                     |
| * <i>Cestrum</i> cf. <i>parqui</i>                   | x                      |                    |                     |
| * <i>Eucalyptus camaldulensis</i>                    | x                      | x                  |                     |
| * <i>Melia azedarach</i>                             | x                      | x                  |                     |
| * <i>Morus alba</i>                                  | x                      | x                  |                     |
| * <i>Pinus</i> sp.                                   | x                      |                    |                     |
| * <i>Populus</i> × <i>canescens</i>                  | x                      | xx                 |                     |
| * <i>Quercus robur</i>                               | x                      |                    |                     |
| * <i>Robinia pseudoacacia</i>                        | x                      | x                  | x                   |
| * <i>Solanum mauritianum</i>                         | x                      | x                  |                     |
| * <i>Tecoma stans</i>                                | x                      | x                  |                     |
| * <i>Ulmus parvifolia</i>                            | x                      |                    |                     |
| <i>Asparagus laricinus</i>                           | x                      | x                  |                     |
| <i>Celtis africana</i>                               | x                      | x                  |                     |
| <i>Felicia muricata</i>                              |                        |                    | x                   |
| <i>Gomphocarpus fruticosus</i>                       | x                      | x                  |                     |
| <i>Searsia lancea</i>                                | x                      | x                  | x                   |
| <i>Seriphium</i> sp.                                 |                        |                    | x                   |
| <i>Vachellia karroo</i>                              | x                      | x                  | x                   |
| <b>HERBACEOUS SPECIES</b>                            |                        |                    |                     |
| * <i>Achyranthes aspera</i>                          | x                      | x                  |                     |
| * <i>Alternanthera pungens</i>                       | x                      |                    |                     |
| * <i>Amaranthus</i> cf. <i>hybridus</i>              | x                      |                    |                     |
| * <i>Araujia sericifera</i>                          | x                      | x                  |                     |
| * <i>Bidens pilosa</i>                               | x                      | x                  | x                   |
| * <i>Datura stramonium</i>                           | x                      | x                  |                     |
| * <i>Erigeron</i> cf. <i>bonariensis</i>             |                        | x                  | x                   |
| * <i>Flaveria bidentis</i>                           | x                      | x                  |                     |
| * <i>Glandularia aristigera</i>                      |                        |                    | x                   |
| * <i>Heliotropium amplexicaule</i>                   | x                      |                    |                     |
| * <i>Ipomoea purpurea</i>                            | x                      |                    |                     |
| * <i>Malva</i> sp.                                   | x                      |                    |                     |
| * <i>Plantago major</i>                              |                        | x                  |                     |
| * <i>Richardia brasiliensis</i>                      | x                      |                    | xx                  |
| * <i>Schkuhria pinnata</i>                           | x                      |                    | x                   |
| * <i>Solanum chenopodioides</i>                      |                        | x                  |                     |
| * <i>Tagetes minuta</i>                              | x                      | x                  |                     |
| * <i>Trifolium repens</i>                            |                        | x                  |                     |
| * <i>Verbena bonariensis</i>                         |                        | x                  | x                   |
| * <i>Zinnia peruviana</i>                            |                        |                    | x                   |
| <i>Cucumis metuliferus</i>                           | x                      |                    | x                   |
| <i>Helichrysum nudifolium</i> var. <i>nudifolium</i> |                        |                    | x                   |
| <i>Helichrysum rugulosum</i>                         |                        |                    | x                   |
| <i>Hilliardiella elaeagnoides</i>                    |                        |                    | x                   |



| Scientific name                                    | Modified / Transformed | Freshwater Habitat | Secondary Grassland |
|----------------------------------------------------|------------------------|--------------------|---------------------|
| <i>Leonotis martinicensis</i>                      | x                      |                    |                     |
| <i>Leonotis nepetifolia</i>                        |                        | x                  |                     |
| <i>Persicaria cf. decipiens</i>                    |                        | x                  |                     |
| <i>Plantago lanceolata</i>                         |                        | x                  | x                   |
| <i>Ranunculus multifidus</i>                       |                        | x                  |                     |
| <i>Sida cf. dregei</i>                             |                        |                    | x                   |
| <b>SUCCULENT SPECIES</b>                           |                        |                    |                     |
| * <i>Yucca</i> sp.                                 | x                      |                    |                     |
| <b>GRAMINOID SPECIES</b>                           |                        |                    |                     |
| * <i>Cenchrus clandestinus</i>                     | x                      | x                  |                     |
| * <i>Eragrostis minor</i>                          | x                      |                    |                     |
| * <i>Paspalum urvillei</i>                         | x                      | x                  |                     |
| <i>Aristida congesta</i> subsp. <i>barbicollis</i> |                        |                    | x                   |
| <i>Aristida congesta</i> subsp. <i>congesta</i>    |                        |                    | x                   |
| <i>Chloris pycnothrix</i>                          | x                      |                    |                     |
| <i>Cymbopogon caesius</i>                          |                        |                    | x                   |
| <i>Cynodon dactylon</i>                            | x                      | x                  |                     |
| <i>Eragrostis chloromelas</i>                      |                        |                    | x                   |
| <i>Eragrostis gummiflua</i>                        |                        |                    | x                   |
| <i>Eragrostis plana</i>                            |                        |                    | xx                  |
| <i>Eragrostis racemosa</i>                         |                        |                    |                     |
| <i>Hyparrhenia hirta</i>                           |                        |                    | x                   |
| <i>Juncus effusus</i>                              |                        | x                  |                     |
| <i>Sporobolus africanus</i>                        |                        |                    | xx                  |
| <i>Themeda triandra</i>                            |                        |                    | x                   |
| <i>Typha capensis</i>                              |                        | x                  |                     |



## APPENDIX C: Floral SCC

South Africa uses the internationally endorsed [IUCN Red List Categories and Criteria](#) in the Red List of South African plants. This scientific system is designed to measure species' risk of extinction. The purpose of this system is to highlight those species that are most urgently in need of conservation action. Due to its strong focus on determining risk of extinction, the IUCN system does not highlight species that are at low risk of extinction but may nonetheless be of high conservation importance. Because the Red List of South African plants is used widely in South African conservation practices such as systematic conservation planning or protected area expansion, we use an amended system of categories designed to highlight those species that are at low risk of extinction but of conservation concern.

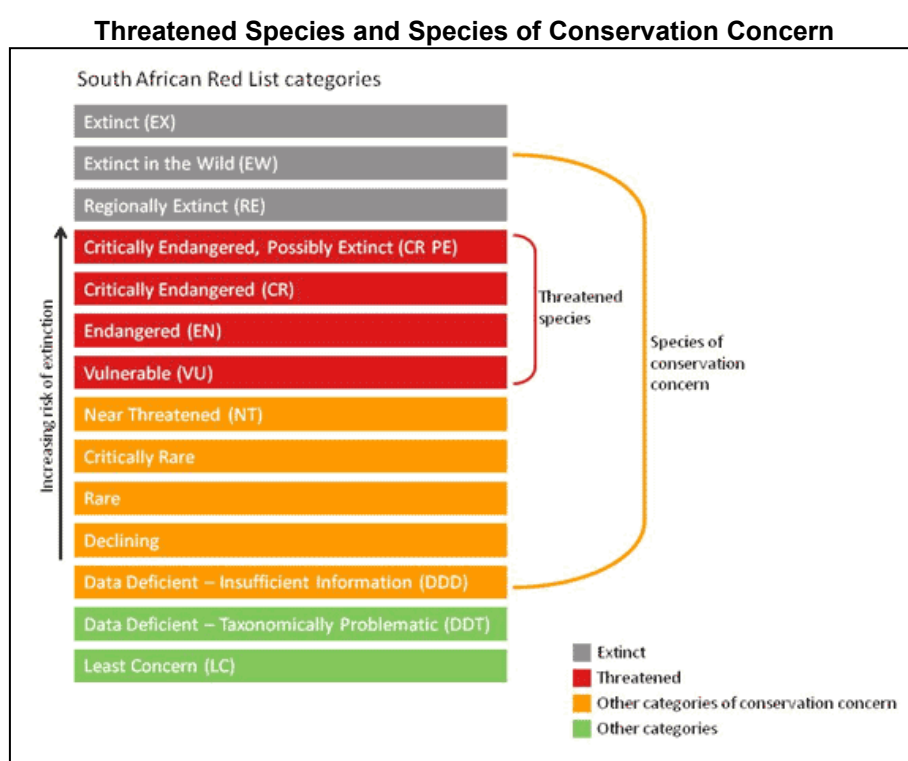
### Definitions of the national Red List categories

Categories marked with <sup>N</sup> are non-IUCN, national Red List categories for species not in danger of extinction but considered of conservation concern. The IUCN equivalent of these categories is Least Concern (LC).

- **Extinct** A species is Extinct when there is no reasonable doubt that the last individual has died. Species should be classified as Extinct only once exhaustive surveys throughout the species' known range have failed to record an individual.
- **Extinct in the Wild (EW)** A species is Extinct in the Wild when it is known to survive only in cultivation or as a naturalized population (or populations) well outside the past range.
- **Regionally Extinct** A species is Regionally Extinct when it is extinct within the region assessed (in this case South Africa), but wild populations can still be found in areas outside the region.
- **Critically Endangered, Possibly Extinct** Possibly Extinct is a special tag associated with the category Critically Endangered, indicating species that are highly likely to be extinct, but the exhaustive surveys required for classifying the species as Extinct has not yet been completed. A small chance remains that such species may still be rediscovered.
- **Critically Endangered (CR)** A species is Critically Endangered when the best available evidence indicates that it meets at least one of the five IUCN criteria for Critically Endangered, indicating that the species is facing an extremely high risk of extinction.
- **Endangered (EN)** A species is Endangered when the best available evidence indicates that it meets at least one of the five IUCN criteria for Endangered, indicating that the species is facing a very high risk of extinction.
- **Vulnerable (VU)** A species is Vulnerable when the best available evidence indicates that it meets at least one of the five IUCN criteria for Vulnerable, indicating that the species is facing a high risk of extinction.
- **Near Threatened (NT)** A species is Near Threatened when available evidence indicates that it nearly meets any of the IUCN criteria for Vulnerable and is therefore likely to become at risk of extinction in the near future.
- <sup>N</sup>**Critically Rare** A species is Critically Rare when it is known to occur at a single site but is not exposed to any direct or plausible potential threat and does not otherwise qualify for a category of threat according to one of the five IUCN criteria.
- <sup>N</sup>**Rare** A species is Rare when it meets at least one of four South African criteria for rarity but is not exposed to any direct or plausible potential threat and does not qualify for a category of threat according to one of the five IUCN criteria. The four criteria are as follows:
  - Restricted range: Extent of Occurrence (EOO) <500 km<sup>2</sup>, OR
  - Habitat specialist: Species is restricted to a specialised microhabitat so that it has a very small Area of Occupancy (AOO), typically smaller than 20 km<sup>2</sup>, OR
  - Low densities of individuals: Species always occurs as single individuals or very small subpopulations (typically fewer than 50 mature individuals) scattered over a wide area, OR
  - Small global population: Less than 10 000 mature individuals.
- **Least Concern (LC)** A species is Least Concern when it has been evaluated against the IUCN criteria and does not qualify for any of the above categories. Species classified as Least Concern are considered at low risk of extinction. Widespread and abundant species are typically classified in this category.



- **Data Deficient - Insufficient Information (DDD)** A species is DDD when there is inadequate information to make an assessment of its risk of extinction, but the species is well defined. Listing of species in this category indicates that more information is required, and that future research could show that a threatened classification is appropriate.
- **Data Deficient - Taxonomically Problematic (DDT)** A species is DDT when taxonomic problems hinder the distribution range and habitat from being well defined, so that an assessment of risk of extinction is not possible.
- **Not Evaluated** A species is Not Evaluated when it has not been evaluated against the criteria. The national Red List of South African plants is a comprehensive assessment of all South African indigenous plants, and therefore all species are assessed and given a national Red List status. However, some species included in [Plants of southern Africa: an online checklist](#) are species that do not qualify for national listing because they are naturalized exotics, hybrids (natural or cultivated), or synonyms. These species are given the status Not Evaluated and the reasons why they have not been assessed are included in the assessment justification.



## Screening Tool Species

**Table C1: POC assessment outcome (scores, threat status, species habitat requirements, etc.) for the RDL species obtained from the SANBI Biodiversity Advisor, National Web Based Screening Tool, as well as from iNaturalist and GBIF (where applicable). Information on species distributions, conservation status, and habitat type were derived from 1) the Red List of South African Plants website (<http://redlist.sanbi.org/index.php>), the 2) SANBI Biodiversity Advisor (<https://biodiversityadvisor.sanbi.org/>), 3) various hardcopy resources such as Saunders et al. (2021), and 4) where deemed necessary, sites such as JSTOR (<https://www.jstor.org/>) was used.**

| Scientific Name                                       | Threat Status (National) | Suitable Habitat                                                                                                                                                                                                        | POC    | Motivation for disputing the presence of the triggered species                                                                                                                                |
|-------------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Bowiea volubilis</i> subsp. <i>volubilis</i>       | VU                       | Shady places, steep rocky slopes and in open woodland, under large boulders in bush or low forest. This subspecies is under severe pressure from medicinal plant harvesting over most of its range in South Africa.     | Low    | No steep rocky slopes or open woodlands in the study area, nor any large boulders in bush or low forest that would support this species.                                                      |
| <i>Cheilanthes deltoidea</i> subsp. <i>silicicola</i> | VU                       | Southwest-facing soil pockets and rock crevices in chert rock. Subpopulations were recently discovered between Centurion and Irene in Gauteng that differ markedly in morphology and habitat from other subpopulations. | Low    | No southwest-facing soil pockets or rock crevices that could support the species.                                                                                                             |
| <i>Cineraria austrotransvaalensis</i>                 | NT                       | Amongst rocks on steep slopes of hills and ridges, as well as at the edge of thick bush or under trees; on all aspects and on a range of rock types: quartzite, dolomite and shale; 1400 – 1700 m.                      | Low    | No rocky environment for the species to grow in.                                                                                                                                              |
| <i>Cleome conrathii</i>                               | NT                       | Stony quartzite slopes, usually in red sandy soil, grassland or open to closed deciduous woodland, all aspects.                                                                                                         | Low    | The study area is not associated with stony quartzite slopes, nor red sandy soil, nor open to closed deciduous woodlands.                                                                     |
| <i>Delosperma leendertziae</i>                        | NT                       | Rocky ridges; on rather steep south facing slopes of quartzite in mountain grassveld.                                                                                                                                   | Low    | No rocky ridges are associated with the study area.                                                                                                                                           |
| <i>Dicliptera magaliesbergensis</i>                   | VU                       | Forest, savanna (Riverine Forest and bush).                                                                                                                                                                             | Low    | No suitable wooded habitat for this species is associated with the study area.                                                                                                                |
| <i>Drimia sanguinea</i>                               | NT                       | Open veld and scrubby woodland in a variety of soil types.                                                                                                                                                              | Medium | Habitat possibly suitable, but the disturbed conditions and already lack of forbs within the study area render this species highly unlikely to be present or to establish viable populations. |
| <i>Habenaria barbertoni</i>                           | NT                       | In grassland on rocky hillsides.                                                                                                                                                                                        | Low    | No rocky hillsides within the study area that could support this species.                                                                                                                     |



| Scientific Name                                                             | Threat Status (National) | Suitable Habitat                                                                                                                                                                          | POC | Motivation for disputing the presence of the triggered species                                   |
|-----------------------------------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------------------------------|
| <i>Habenaria kraenzliniana</i>                                              | NT                       | Terrestrial in stony, grassy hillsides, recorded from 1000 to 1400m.                                                                                                                      | Low | No rocky hillsides within the study area that could support this species.                        |
| <i>Habenaria mossii</i>                                                     | EN                       | Open grassland on dolomite or in black sandy soil.                                                                                                                                        | Low |                                                                                                  |
| <i>Holothrix randii</i>                                                     | NT                       | Grassy slopes and rock ledges, usually southern aspects.                                                                                                                                  | Low | No prominent rock ledges within the study area that could support this species.                  |
| <i>Khadia beswickii</i>                                                     | VU                       | Open areas on shallow surfaces over rocks in grassland.                                                                                                                                   | Low | The site was not rocky and this species, therefore, is unlikely to be present in the study area. |
| <i>Lithops lesliei</i> subsp. <i>lesliei</i> ; & subsp. <i>rubrobrunnea</i> | NT                       | Primary habitat appears to be the arid grasslands in the interior of South Africa where it usually occurs in rocky places, growing under the protection of surrounding forbs and grasses. | Low | No prominent rocky places within the study area that could support this species.                 |
| <i>Melolobium subspicatum</i>                                               | VU                       | A rare and localised species endemic to Gauteng Province in South Africa. It grows exclusively in grassland on dolomite and is known from only three localities.                          | Low | Outside of the known localities.                                                                 |

POC = Probability of Occurrence.



## NEMBA TOPS List for South Africa<sup>22</sup>

**Table C2: TOPS list for South Africa – plant species.**

| NEMBA TOPS LIST (PLANT SPECIES)                           |                          |     |                                                                                                                                                                                                                                                                                                                                                   |                     |
|-----------------------------------------------------------|--------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Scientific Name                                           | Common Name              | POC | Provincial Distribution                                                                                                                                                                                                                                                                                                                           | Conservation Status |
| <i>Adenia wilmsii</i>                                     | No common name           | Low | Provincial distribution: Mpumalanga<br>Range: Lydenburg to Waterval Boven<br>Description: Dolerite outcrops or red loam soil, in open woodland, 1300-1500 m.                                                                                                                                                                                      | EN; P               |
| <i>Adenium swazicum</i>                                   | Swaziland Impala Lily    | Low | Range: Kruger National Park to Swaziland along the Lebombo Mountains and adjacent areas in south-western Mozambique.                                                                                                                                                                                                                              | VU                  |
| <i>Adenium swazicum</i>                                   | Swaziland Impala Lily    | Low | Provincial distribution: Mpumalanga                                                                                                                                                                                                                                                                                                               | VU                  |
| <i>Aloe albida</i>                                        | Grass Aloe               | Low | Provincial distribution: Mpumalanga<br>Range: Aloe albida has a restricted range in the mountains south of Barberton, Mpumalanga, extending to Malolotja in north-western Swaziland.                                                                                                                                                              | NT                  |
| <i>Aloe pillansii</i> (now <i>Aloidendron pillansii</i> ) | False Quiver Tree        | Low | Provincial distribution: Northern Cape<br>Range: Richtersveld and southern Namibia.                                                                                                                                                                                                                                                               | EN                  |
| <i>Aloe simii</i>                                         | No common name           | Low | Provincial distribution: Mpumalanga<br>Range: This species is endemic to a small area in the transition area between the Mpumalanga Lowveld and Escarpment, where it occurs from Sabie southwards to White River and around Nelspruit.<br>Description: It occurs along drainage lines and in wetlands in open woodland and grassland, 600-1100 m. | EN; P               |
| <i>Clivia mirabilis</i>                                   | "Oorlogskloof" Bush Lily | Low | Provincial distribution: Northern Cape, Western Cape                                                                                                                                                                                                                                                                                              | VU; P               |
| <i>Diaphananthe millarii</i>                              | Tree Orchid              | Low | Provincial distribution: Eastern Cape, KwaZulu-Natal<br>Range: East London and Durban.                                                                                                                                                                                                                                                            | VU                  |
| <i>Disa macrostachya</i>                                  | No common name           | Low | Provincial distribution: Northern Cape                                                                                                                                                                                                                                                                                                            | EN; P               |
| <i>Disa nubigena</i>                                      | No common name           | Low | Provincial distribution: Western Cape                                                                                                                                                                                                                                                                                                             | Rare; P             |
| <i>Disa physodes</i>                                      | No common name           | Low | Provincial distribution: Western Cape                                                                                                                                                                                                                                                                                                             | CR; P               |
| <i>Disa procera</i>                                       | No common name           | Low | Provincial distribution: Western Cape                                                                                                                                                                                                                                                                                                             | EN; P               |
| <i>Disa sabulosa</i>                                      | No common name           | Low | Provincial distribution: Western Cape                                                                                                                                                                                                                                                                                                             | EN; P               |
| <i>Encephalartos aemulans</i>                             | Ngotshe Cycad            | Low | Provincial distribution: KwaZulu-Natal                                                                                                                                                                                                                                                                                                            | CR                  |
| <i>Encephalartos altensteinii</i>                         | Bread Palm               | Low | Provincial distribution: Eastern Cape, KwaZulu-Natal                                                                                                                                                                                                                                                                                              | VU; P               |
| <i>Encephalartos arenarius</i>                            | Dune Cycad               | Low | Provincial distribution: Eastern Cape                                                                                                                                                                                                                                                                                                             | EN                  |
| <i>Encephalartos brevifoliolatus</i>                      | Escarpment Cycad         | Low | Provincial distribution: Limpopo                                                                                                                                                                                                                                                                                                                  | EW                  |
| <i>Encephalartos caffer</i>                               | Breadfruit Tree          | Low | Provincial distribution: Eastern Cape, KwaZulu-Natal                                                                                                                                                                                                                                                                                              | NT; P               |
| <i>Encephalartos cerinus</i>                              | Waxen Cycad              | Low | Provincial distribution: KwaZulu-Natal                                                                                                                                                                                                                                                                                                            | CR                  |

<sup>22</sup> National Environmental Management: Biodiversity Act 10 of 2004 - Threatened or Protected Species Regulations, 2007. Government Notice R152 in Government Gazette 29657 dated 23 February 2007. Commencement date: 1 June 2007 [GN R150, Gazette no. 29657], as amended.



| NEMBA TOPS LIST (PLANT SPECIES)          |                         |     |                                                                                                                                                                       |                     |
|------------------------------------------|-------------------------|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Scientific Name                          | Common Name             | POC | Provincial Distribution                                                                                                                                               | Conservation Status |
| <i>Encephalartos cupidus</i>             | Blyde River Cycad       | Low | Provincial distribution: Limpopo, Mpumalanga<br>Description: Grassland, on steep, rocky slopes, or cliffs and sometimes near seepage areas bordering gallery forests. | CR                  |
| <i>Encephalartos dolomiticus</i>         | Wolkberg Cycad          | Low | Provincial distribution: Limpopo                                                                                                                                      | CR                  |
| <i>Encephalartos dyerianus</i>           | Lowveld Cycad           | Low | Provincial distribution: Limpopo                                                                                                                                      | CR; P               |
| <i>Encephalartos eugene-maraisii</i>     | Waterberg Cycad         | Low | Provincial distribution: Limpopo                                                                                                                                      | EN                  |
| <i>Encephalartos friderici-guilielmi</i> | No common name          | Low | Provincial distribution: Eastern Cape, KwaZulu-Natal                                                                                                                  | NT; P               |
| <i>Encephalartos ghellinckii</i>         | No common name          | Low | Provincial distribution: Eastern Cape, KwaZulu-Natal                                                                                                                  | VU; P               |
| <i>Encephalartos heenanii</i>            | Woolly Cycad            | Low | Provincial distribution: Mpumalanga<br>Description: Open areas of montane grasslands amidst scarp forest in deep valleys and ravines.                                 | CR                  |
| <i>Encephalartos hirsutus</i>            | Venda Cycad             | Low | Provincial distribution: Limpopo                                                                                                                                      | CR                  |
| <i>Encephalartos horridus</i>            | Eastern Cape Blue Cycad | Low | Provincial distribution: Eastern Cape                                                                                                                                 | EN                  |
| <i>Encephalartos humilis</i>             | No common name          | Low | Provincial distribution: Mpumalanga<br>Description: Montane and mistbelt grassland, rocky sandstone slopes.                                                           | VU; P               |
| <i>Encephalartos inopinus</i>            | Lydenburg Cycad         | Low | Provincial distribution: Limpopo                                                                                                                                      | CR                  |
| <i>Encephalartos laevifolius</i>         | Kaapsehoop Cycad        | Low | Provincial distribution: Eastern Cape, KwaZulu-Natal, Limpopo, Mpumalanga.<br>Description: Steep, rocky slopes in mistbelt grassland, 1300-1500 m.                    | CR                  |
| <i>Encephalartos lanatus</i>             | No common name          | Low | Provincial distribution: Gauteng and western Mpumalanga<br>Description: Sheltered, wooded ravines in sandstone ridges, 1200-1500 m.                                   | NT; P               |
| <i>Encephalartos latifrons</i>           | Albany Cycad            | Low | Provincial distribution: Eastern Cape                                                                                                                                 | CR                  |
| <i>Encephalartos lebomboensis</i>        | Lebombo Cycad           | Low | Provincial distribution: KwaZulu-Natal, Mpumalanga<br>Description: Cliffs and rocky ravines in the savanna and the grassland.                                         | EN                  |
| <i>Encephalartos lehmannii</i>           | No common name          | Low | Provincial distribution: Eastern Cape                                                                                                                                 | NT; P               |
| <i>Encephalartos longifolius</i>         | No common name          | Low | Provincial distribution: Eastern Cape                                                                                                                                 | NT; P               |
| <i>Encephalartos middelburgensis</i>     | Middelburg Cycad        | Low | Provincial distribution: Gauteng, Mpumalanga<br>Description: Open grasslands and in sheltered valleys.                                                                | CR                  |
| <i>Encephalartos msinganus</i>           | Msinga, Cycad           | Low | Provincial distribution: KwaZulu-Natal                                                                                                                                | CR                  |
| <i>Encephalartos natalensis</i>          | Natal Giant Cycad       | Low | Provincial distribution: Eastern Cape, KwaZulu-Natal                                                                                                                  | NT; P               |
| <i>Encephalartos ngoyanus</i>            | Ngoye Dwarf Cycad       | Low | Provincial distribution: KwaZulu-Natal                                                                                                                                | VU                  |
| <i>Encephalartos nubimontanus</i>        | Blue Cycad              | Low | Provincial distribution: Limpopo                                                                                                                                      | EW                  |
| <i>Encephalartos paucidentatus</i>       | No common name          | Low | Provincial distribution: Mpumalanga<br>Description: Forest, occurs on steep rocky slopes and alongside streams in deep gorges.                                        | VU; P               |



| NEMBA TOPS LIST (PLANT SPECIES)                         |                     |     |                                                                                                                                                                                                                                                                                                                        |                     |
|---------------------------------------------------------|---------------------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Scientific Name                                         | Common Name         | POC | Provincial Distribution                                                                                                                                                                                                                                                                                                | Conservation Status |
| <i>Encephalartos princeps</i>                           | No common name      | Low | Provincial distribution: Eastern Cape                                                                                                                                                                                                                                                                                  | VU; P               |
| <i>Encephalartos senticosus</i>                         | No common name      | Low | Provincial distribution: KwaZulu-Natal                                                                                                                                                                                                                                                                                 | VU; P               |
| <i>Encephalartos transvenosus</i>                       | Modjadje Cycad      | Low | Provincial distribution: Limpopo                                                                                                                                                                                                                                                                                       | LC; P               |
| <i>Encephalartos trispinosus</i>                        | No common name      | Low | Provincial distribution: Eastern Cape                                                                                                                                                                                                                                                                                  | VU; P               |
| <i>Encephalartos woodii</i>                             | Wood's Cycad        | Low | Provincial distribution: KwaZulu-Natal                                                                                                                                                                                                                                                                                 | EW                  |
| <i>Euphorbia clivicola</i>                              | No common name      | Low | Provincial distribution: Limpopo                                                                                                                                                                                                                                                                                       | CR; P               |
| <i>Euphorbia meloformis</i>                             | No common name      | Low | Provincial distribution: Eastern Cape                                                                                                                                                                                                                                                                                  | NT; P               |
| <i>Euphorbia obesa</i>                                  | No common name      | Low | Provincial distribution: Eastern Cape                                                                                                                                                                                                                                                                                  | EN; P               |
| <i>Harpagophytum procumbens</i>                         | Devil's Claw        | Low | Provincial distribution: Free State, Limpopo, Northern Cape, North West                                                                                                                                                                                                                                                | LC; P               |
| <i>Harpagophytum zeyherii</i>                           | Devil's Claw        | Low | Provincial distribution: Gauteng, Limpopo, Mpumalanga, North West                                                                                                                                                                                                                                                      | LC; P               |
| <i>Hoodia currorii</i>                                  | Ghaap               | Low | Provincial distribution: Limpopo                                                                                                                                                                                                                                                                                       | P                   |
| <i>Hoodia gordonii</i>                                  | Ghaap               | Low | Provincial distribution: Free State, Northern Cape, Western Cape                                                                                                                                                                                                                                                       | DDD; P              |
| <i>Jubaeopsis caffra</i>                                | Pondoland Coconut   | Low | Provincial distribution: Eastern Cape                                                                                                                                                                                                                                                                                  | EN                  |
| <i>Merwillia plumbea</i>                                | Blue Squill         | Low | Provincial distribution: KwaZulu-Natal, Mpumalanga<br>Major habitats: Grassland<br>Description: Montane mistbelt and Ngongoni grassland, rocky areas on steep, well drained slopes. 300-2500 m.                                                                                                                        | NT                  |
| <i>Newtonia hildebrandtii</i> var. <i>hildebrandtii</i> | Lebombo Wattle      | Low | Provincial distribution: KwaZulu-Natal                                                                                                                                                                                                                                                                                 | Now LC              |
| <i>Protea odorata</i>                                   | Swartland Sugarbush | Low | Provincial distribution: Western Cape                                                                                                                                                                                                                                                                                  | CR; P               |
| <i>Siphonochilus aethiopicus</i>                        | Wild Ginger         | Low | Provincial distribution: KwaZulu-Natal, Limpopo, Mpumalanga<br>Range: Sporadically from the Letaba catchment in the Limpopo Lowveld to Swaziland. Extinct in KwaZulu-Natal. Widespread elsewhere in Africa.<br>Description: Tall open or closed woodland, wooded grassland, or bushveld.                               | CR                  |
| <i>Stangeria eriopus</i>                                | No common name      | Low | Provincial distribution: Eastern Cape, KwaZulu-Natal                                                                                                                                                                                                                                                                   | VU; P               |
| <i>Warburgia salutaris</i>                              | Pepper-bark Tree    | Low | Provincial distribution: KwaZulu-Natal, Limpopo, Mpumalanga<br>Range: North-eastern KwaZulu-Natal, Mpumalanga, and Limpopo Province. Also occurs in Swaziland, Mozambique, Zimbabwe, and Malawi.<br>Description: Variable, including coastal, riverine, dune and montane forest as well as open woodland and thickets. | EN                  |
| <i>Zantedeschia jucunda</i>                             | Yellow Arum Lilly   | Low | Provincial distribution: Limpopo                                                                                                                                                                                                                                                                                       | VU                  |

CR = Critically Endangered, EN = Endangered, EW = Extinct in the Wild, NT = Near Threatened, VU = Vulnerable, P = Protected, POC = Probability of Occurrence.



## TNCO-protected Species

**Table C4: POC assessment results for Schedule 11 provincially protected floral species.**  
**\*\*Protected Plants as per the Transvaal Nature Conservation Ordinance, 1983 (Ordinance No. 12 of 1983) (TNCO), which provides a list of Protected Plants (Schedule 11) and Specially Protected Species (Schedule 12). This Ordinance will be repealed as far as it relates to the North West Province when the North West Biodiversity Management Act, 2017, comes into force. Subject to the provisions of this Ordinance, no person shall pick a protected plant, unless he is the holder of a permit which authorises him to do so.**

| Schedule 11 (Protected Plant Species)                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                  |        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------|
| Common Name                                                                                                                                                                                                                                                                                                                                                                                                                      | Scientific Name                                                                                                                                                                                                                                                                                                                                                                                                                                              | Status           | POC    |
| All species of tree moss                                                                                                                                                                                                                                                                                                                                                                                                         | <i>Porothamnium</i> , <i>Pilotrichella</i> and <i>Papillaria</i> spp.                                                                                                                                                                                                                                                                                                                                                                                        | LC               | Low    |
| All species of true ferns excluding the bracken fern                                                                                                                                                                                                                                                                                                                                                                             | Class Filicinae excluding <i>Pteridium aquilinum</i>                                                                                                                                                                                                                                                                                                                                                                                                         | LC               | Low    |
| All plants of cycads not occurring in Transvaal                                                                                                                                                                                                                                                                                                                                                                                  | All plants of the genus <i>Encephalartos</i> not occurring and the seedlings of the species of cycads in Transvaal and the seedlings of the species referred to in Schedule 12 (a) of <i>Encephalartos</i> referred to in Schedule 12 (a).<br><br>*No species of <i>Encephalartos</i> recorded on site with no suitable habitat conditions available for these species.                                                                                      | Species-specific | Low    |
| All species of yellow wood                                                                                                                                                                                                                                                                                                                                                                                                       | <i>Podocarpus</i> spp.                                                                                                                                                                                                                                                                                                                                                                                                                                       | LC               | Low    |
| All species of wild cypress                                                                                                                                                                                                                                                                                                                                                                                                      | <i>Widdringtonia</i> spp.                                                                                                                                                                                                                                                                                                                                                                                                                                    | Species-specific | Low    |
| Borassus palm                                                                                                                                                                                                                                                                                                                                                                                                                    | <i>Borassus aethiopicum</i>                                                                                                                                                                                                                                                                                                                                                                                                                                  | LC               | Low    |
| All species of arum lilies                                                                                                                                                                                                                                                                                                                                                                                                       | <i>Zantedeschia</i> spp.                                                                                                                                                                                                                                                                                                                                                                                                                                     | Species-specific | Low    |
| All species of flame lilies                                                                                                                                                                                                                                                                                                                                                                                                      | <i>Gloriosa</i> spp.                                                                                                                                                                                                                                                                                                                                                                                                                                         | LC               | Low    |
| All species of Christmas bells                                                                                                                                                                                                                                                                                                                                                                                                   | <i>Littonia</i> spp.                                                                                                                                                                                                                                                                                                                                                                                                                                         | LC               | Low    |
| All species of red-hot poker                                                                                                                                                                                                                                                                                                                                                                                                     | <i>Kniphofia</i> spp.                                                                                                                                                                                                                                                                                                                                                                                                                                        | Species-specific | Medium |
| All species of aloes excluding<br>(a) All species not occurring in the Transvaal;<br>(b) the following species: <i>Aculeata</i> , <i>Ammophilla</i> , <i>Arborescens</i> , <i>Barbertoniae</i> , <i>Castanea</i> , <i>Davyana</i> , <i>Globuligemma</i> , <i>Grandidentata</i> , <i>Grandidentata</i> , <i>Lutescens</i> , <i>Marlothii</i> , <i>Mutans</i> , <i>Parvibracteata</i> , <i>Transvaalensis</i> and <i>Wickensii</i> | All species of <i>Aloes</i> excluding<br>(a) All species not occurring in the Transvaal;<br>(b) the following species: <i>A. aculeata</i> , <i>A. ammophilla</i> , <i>A. arborescens</i> , <i>A. barbertoniae</i> , <i>A. castanea</i> , <i>A. davyana</i> , <i>A. globuligemma</i> , <i>A. grandidentata</i> , <i>A. lutescens</i> , <i>A. marlothii</i> , <i>A. mutans</i> , <i>A. parvibracteata</i> , <i>A. transvaalensis</i> , and <i>A. wickensii</i> | Species-specific | Low    |
| All species of agapanthus                                                                                                                                                                                                                                                                                                                                                                                                        | <i>Agapanthus</i> spp.                                                                                                                                                                                                                                                                                                                                                                                                                                       | Species-specific | Low    |
| blue squill                                                                                                                                                                                                                                                                                                                                                                                                                      | <i>Schilla natalensis</i> (now <i>Merwillia plumbea</i> )                                                                                                                                                                                                                                                                                                                                                                                                    | NT               | Low    |
| All species of pineapple flower                                                                                                                                                                                                                                                                                                                                                                                                  | <i>Eucomis</i> spp.                                                                                                                                                                                                                                                                                                                                                                                                                                          | Species-specific | Medium |
| All species of galtonia                                                                                                                                                                                                                                                                                                                                                                                                          | <i>Galtonia</i> spp.                                                                                                                                                                                                                                                                                                                                                                                                                                         | Species-specific | Low    |
| All species of dracaena                                                                                                                                                                                                                                                                                                                                                                                                          | <i>Dracaena</i> spp.                                                                                                                                                                                                                                                                                                                                                                                                                                         | Species-specific | Low    |
| All species of paint brush                                                                                                                                                                                                                                                                                                                                                                                                       | <i>Haemanthus</i> spp.                                                                                                                                                                                                                                                                                                                                                                                                                                       | Species-specific | Low    |
| All species of paint brush                                                                                                                                                                                                                                                                                                                                                                                                       | <i>Scadoxus</i> spp.                                                                                                                                                                                                                                                                                                                                                                                                                                         | LC               | Medium |
| All species of clivia                                                                                                                                                                                                                                                                                                                                                                                                            | <i>Clivia</i> spp.                                                                                                                                                                                                                                                                                                                                                                                                                                           | Species-specific | Low    |
| All species of nerine                                                                                                                                                                                                                                                                                                                                                                                                            | <i>Nerine</i> spp.                                                                                                                                                                                                                                                                                                                                                                                                                                           | Species-specific | Low    |



| Schedule 11 (Protected Plant Species)                                                            |                                                                                                                                                                                                                                                                                      |                  |        |
|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------|
| Common Name                                                                                      | Scientific Name                                                                                                                                                                                                                                                                      | Status           | POC    |
| Pink brunsvigia                                                                                  | <i>Brunsvigia radulosa</i>                                                                                                                                                                                                                                                           | LC               | Low    |
| All species of crinum                                                                            | <i>Crinum</i> spp.                                                                                                                                                                                                                                                                   | LC               | Low    |
| Ground lily                                                                                      | <i>Ammocharis coramica</i>                                                                                                                                                                                                                                                           | LC               | Low    |
| All species of fire lily                                                                         | <i>Cyrtanthus</i> spp.                                                                                                                                                                                                                                                               | Species-specific | Low    |
| All species of elephant's foot                                                                   | <i>Dioscorea</i> spp.                                                                                                                                                                                                                                                                | Species-specific | Low    |
| All species of irises                                                                            | <i>Dietes</i> spp.                                                                                                                                                                                                                                                                   | Species-specific | Low    |
| River lily                                                                                       | <i>Schizostylis coccinea</i> (= <i>Hesperantha coccinea</i> )                                                                                                                                                                                                                        | LC               | Low    |
| All species of hairbells                                                                         | <i>Dierama</i> spp.                                                                                                                                                                                                                                                                  | Species-specific | Low    |
| All species of babiana                                                                           | <i>Babiana</i> spp.                                                                                                                                                                                                                                                                  | Species-specific | Low    |
| All species of gladioli                                                                          | <i>Gladiolus</i> spp.                                                                                                                                                                                                                                                                | Species-specific | High   |
| All species of laparousia                                                                        | <i>Lapeirousia</i> spp.                                                                                                                                                                                                                                                              | Species-specific | Low    |
| All species of watsonias                                                                         | <i>Watsonia</i> spp.                                                                                                                                                                                                                                                                 | Species-specific | Low    |
| Wild banana                                                                                      | <i>Ensete ventricosum</i>                                                                                                                                                                                                                                                            | LC               | Low    |
| Transvaal strelitzia                                                                             | <i>Strelitzia caudata</i>                                                                                                                                                                                                                                                            | LC               | Low    |
| Wild ginger                                                                                      | <i>Kaempferia aethiopica</i> (= <i>Siphonochilus aethiopicus</i> )                                                                                                                                                                                                                   | CR               | Low    |
| Wild ginger                                                                                      | <i>Burmannia madagascariensis</i>                                                                                                                                                                                                                                                    | LC               | Low    |
| All species of orchids excluding those species not occurring in Transvaal occurring in Transvaal | Orchidaceae spp. excluding those species not occurring in Transvaal occurring in Transvaal.                                                                                                                                                                                          | Species-specific | Medium |
| All species of proteas excluding those species not occurring in Transvaal occurring in Transvaal | <i>Protea</i> spp. excluding those species not occurring in Transvaal occurring in Transvaal.                                                                                                                                                                                        | Species-specific | Low    |
| Pincushion                                                                                       | <i>Leucospermum gerrardii</i>                                                                                                                                                                                                                                                        | VU               | Low    |
| Stone plant                                                                                      | <i>Frithia pulchra</i>                                                                                                                                                                                                                                                               | Rare             | Low    |
| Stone plant                                                                                      | <i>Lithops lesliei</i>                                                                                                                                                                                                                                                               | VU               | Low    |
| Schreber's waterlily                                                                             | <i>Brasenia schreberi</i>                                                                                                                                                                                                                                                            | LC               | Low    |
| All species of waterlilies                                                                       | <i>Nymphaea</i> spp.                                                                                                                                                                                                                                                                 | Species-specific | Low    |
| Wonderplant                                                                                      | <i>Tinospora fragosum</i>                                                                                                                                                                                                                                                            | LC               | Low    |
| Black stinkwood                                                                                  | <i>Ocotea bullata</i>                                                                                                                                                                                                                                                                | EN               | Low    |
| Stinkwood                                                                                        | <i>Ocotea kenyensis</i>                                                                                                                                                                                                                                                              | VU               | Low    |
| Kiaat                                                                                            | <i>Pterocarpus angolensis</i>                                                                                                                                                                                                                                                        | LC               | Low    |
| Tamboti                                                                                          | <i>Spirostachys africana</i>                                                                                                                                                                                                                                                         | LC               | Low    |
| The following species of the genus Euphorbia:                                                    | <i>E. barnardii</i> (EN), <i>E. clivicola</i> (CR), <i>E. grandialata</i> (Rare), <i>E. groenewaldii</i> (CR), <i>E. knobelli</i> (EN), <i>E. perangusta</i> (DDT), <i>E. restricta</i> (Rare), <i>E. rowlandii</i> (NT), <i>E. tortirama</i> (LC), <i>E. waterbergensis</i> (Rare). | Species-specific | Low    |
| Baobab                                                                                           | <i>Adansonia digitata</i>                                                                                                                                                                                                                                                            | LC               | Low    |
| All species of begonias                                                                          | <i>Begonia</i> spp.                                                                                                                                                                                                                                                                  | Species-specific | Low    |
| All species of cabbage trees                                                                     | <i>Cussonia</i> spp.                                                                                                                                                                                                                                                                 | LC               | Low    |
| The following species of Ericas (heaths):<br>Alopecurus, Cerinthoides and Oatesii                | The following species of the genus <i>Erica</i> :<br><i>E. alopecurus</i> , <i>E. cerinthoides</i> and <i>E. oatesii</i>                                                                                                                                                             | LC               | Low    |
| Big leaf fever tree                                                                              | <i>Anthocleista grandiflora</i>                                                                                                                                                                                                                                                      | LC               | Low    |



| Schedule 11 (Protected Plant Species)                                                         |                                                                                                                    |                  |     |
|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------|-----|
| Common Name                                                                                   | Scientific Name                                                                                                    | Status           | POC |
| The following species of impala lilies: <i>Obesum</i> , <i>Oleifolium</i> and <i>Swazicum</i> | The following species of the genus <i>Adenium</i> : <i>A. obesum</i> , <i>A. oleifolium</i> and <i>A. swazicum</i> | Species-specific | Low |
| Kudu lily                                                                                     | <i>Pachypodium saundersii</i>                                                                                      | LC               | Low |
| All species of <i>Brachystelma</i>                                                            | <i>Brachystelma</i> spp.                                                                                           | Species-specific | Low |
| All species of <i>Ceropegia</i>                                                               | <i>Ceropegia</i> spp.                                                                                              | Species-specific | Low |
| All species of <i>Riocreuxias</i>                                                             | <i>Riocreuxia</i> spp.                                                                                             | Species-specific | Low |
| All species of Ghaap                                                                          | <i>Tavaresia</i> spp.                                                                                              | Species-specific | Low |
| All species of <i>Huerniopsis</i> and <i>Huernia</i>                                          | <i>Huerniopsis</i> and <i>Huernia</i> spp.                                                                         | Species-specific | Low |
| All species of <i>Duvalia</i>                                                                 | <i>Duvalia</i> spp.                                                                                                | Species-specific | Low |
| All species of stapeliads                                                                     | <i>Stapelia</i> spp.                                                                                               | Species-specific | Low |
| Stapeliad                                                                                     | <i>Hoodia lugardii</i>                                                                                             | LC               | Low |
| All species of <i>Orbeanthus</i>                                                              | <i>Orbeanthus</i> spp.                                                                                             | Species-specific | Low |
| All species of <i>Orbeas</i>                                                                  | <i>Orbea</i> spp.                                                                                                  | Species-specific | Low |
| All species of <i>Pachycymbiums</i>                                                           | <i>Pachycymbium</i> spp.                                                                                           | Species-specific | Low |
| All species of <i>Orbeopsis</i>                                                               | <i>Orbeopsis</i> spp.                                                                                              | Species-specific | Low |
| All species of Primulas                                                                       | <i>Streptocarpus</i> spp.                                                                                          | Species-specific | Low |

CR= Critically Endangered, EN = Endangered, LC = Least Concern; NT = Near Threatened, POC = Probability of Occurrence; VU = Vulnerable.

**Table C5: POC assessment results for Schedule 12 provincially protected floral species.**

**\*\*Protected Plants as per the Transvaal Nature Conservation Ordinance, 1983 (Ordinance No. 12 of 1983) (TNCO), which provides a list of Protected Plants (Schedule 11) and Specially Protected Species (Schedule 12). This Ordinance will be repealed as far as it relates to the North West Province when the North West Biodiversity Management Act, 2017, comes into force. Subject to the provisions of this Ordinance, no person shall pick a protected plant, unless he is the holder of a permit which authorises him to do so.**

| Schedule 12 (Specially Protected Plant Species)                                                                                                            |                           |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----|
| Common Name                                                                                                                                                | Scientific Name           | POC |
| In this schedule "seedling" means a cultivated plant of which the diameter of the trunk or bulb, either above or below the ground, does not exceed 150 mm. |                           |     |
| (a) All plants, excluding seedlings, of the following cycads of the Genus <i>Encephalartos</i> :                                                           |                           |     |
| Dolomiticus                                                                                                                                                | <i>E. dolomiticus</i>     | Low |
| Dyer                                                                                                                                                       | <i>E. dyerianus</i>       | Low |
| Middelburg                                                                                                                                                 | <i>E. middelburgensis</i> | Low |
| Eugene marais                                                                                                                                              | <i>E. eugene</i>          | Low |
| Maraisii heenan                                                                                                                                            | <i>E. heenanu</i>         | Low |
| Inopinus                                                                                                                                                   | <i>E. inopinus</i>        | Low |
| Laevifolius                                                                                                                                                | <i>E. laevifolius</i>     | Low |
| Lanatus                                                                                                                                                    | <i>E. lanatus</i>         | Low |
| Lebombo                                                                                                                                                    | <i>E. lebomboensis</i>    | Low |
| Ngoyanus                                                                                                                                                   | <i>E. ngoyanus</i>        | Low |
| Paucidentatus                                                                                                                                              | <i>E. paucidentatus</i>   | Low |
| Modjadje                                                                                                                                                   | <i>E. transvenosus</i>    | Low |
| Villosus                                                                                                                                                   | <i>E. villosus</i>        | Low |
| (b) All plants of the following cycad <i>Encephalartos</i> species:                                                                                        |                           |     |
| Cupidus                                                                                                                                                    | <i>E. cupidus</i>         | Low |
| Humilus                                                                                                                                                    | <i>E. humilus</i>         | Low |

