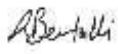
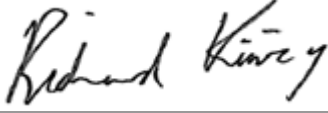




# **CORNUBIA NORTH: VEGETATION AND ECOLOGICAL ASSESSMENT**

## **Draft Report**

**ISSUE DATE:** APRIL 2014  
**REVISION NO.:** 1  
**PROJECT NO.:** 12267

Date:	April 2014
Document Title:	Cornubia North: Vegetation and Ecological Assessment. Draft Report
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Revision Number:	1
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#### Declaration

I, Dr. Richard Grant Kinvig, declare that I –

- act as an independent consultant in the field of Ecology and Botany and have undertaken the **Ecological and Vegetation Assessment** for the site identified for assessment for the proposed development known as Cornubia North, Ethekewini Municipality.
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2006;
- have and will not have any vested interest in the proposed activity proceeding;
- have no, and will not engage in, conflicting interests in the undertaking of the activity;
- undertake to disclose, to the competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the Environmental Impact Assessment Regulations, 2006; and
- will provide the competent authority with access to all information at our disposal regarding the application, whether such information is favourable to the applicant or not.

# CORNUBIA NORTH: VEGETATION AND ECOLOGICAL ASSESSMENT DRAFT REPORT

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# **CORNUBIA NORTH: VEGETATION AND ECOLOGICAL ASSESSMENT DRAFT REPORT**

## **1. INTRODUCTION**

**SiVEST Environmental Division** was appointed by **Tongaat Hulett Developments (THD) PTY (Ltd)** to undertake an Ecological Assessment of the land holding north of the Ohlanga River, known as Cornubia North.

The purpose of the assessment is to consider the potential impacts that may be imparted as a result of development that is proposed for the site. Currently the detail relating to what exactly is to be proposed is still not known. However, consideration of the receiving environment, particularly the non-cultivated areas, which are a mix of indigenous vegetation and alien vegetation, depending on the position of these areas within the site boundary, is to be undertaken.

## **2. PROJECT DESCRIPTION & MOTIVATION**

The Cornubia North Land holding is proposed to be converted from its current use; agriculture to some form of development. The development will see the establishment of top structures of varying sizes and magnitudes as well as infrastructure, such as; roads, storm water, potable water, sewer reticulation, electrical reticulation and communication infrastructure.

Decisions regarding the exact number and building typology of the development are yet to be finalised. Therefore the reasoning to undertake this assessment is to provide information on sensitive environments and ensure that the development is undertaken in a way which considers these environments and is sustainable.

## **3. TERMS OF REFERENCE**

The following terms of reference were provided for this assessment:

- Assess the vegetation within the non-cultivated areas;
- Identify potential rare and / or threatened species that may occur within the property;
- Identify vegetation “hotspots” which are of value from a biodiversity and conservation perspective;
- Evaluate the continuity of the vegetation and assess its potential to add value to the ecological functioning on the site;
- Identify potential generic impacts which may be imparted on the site, and;
- Provide potential mitigation measures for the generic impacts.

## 4. REGULATIONS GOVERNING THIS REPORT & LEGISLATION

Further to the Terms of Reference, the following protocol is extracted from the National Environmental Management Act, Act 108 of 1998 (NEMA). The relevant Section is **Section 32** and is included below for your ease of reference:

### 32. Specialist reports and reports on specialised processes

- (1) An applicant or the EAP managing an application may appoint a person who is independent to carry out a specialist study or specialised process.
- (2) The Person referred to in sub-regulation (1) must comply with the requirements of Regulation 17.
- (3) A specialist report or a report on a specialised process prepared in terms of these Regulations must contain –
  - (a) details of –
    - (i) the person who prepared the report; and
    - (ii) the expertise of that person to carry out the specialist study or specialised process;
  - (b) a declaration that the person is independent in a form as may be specified by the competent authority;
  - (c) an indication of the scope of, and the purpose for which, the report was prepared;
  - (d) a description of the methodology adopted in preparing the report or carrying out the specialised process;
  - (e) a description of any assumptions made and any uncertainties or gaps in knowledge;
  - (f) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment;
  - (g) recommendations in respect of any mitigation measures that should be considered by the applicant and the competent authority;
  - (h) a description of any consultation process that was undertaken during the course of carrying out the study;
  - (i) a summary and copies of any comments that were received during any consultation process; and
  - (j) any other information requested by the competent authority.

In addition there are various Sections of the legislation that would be applicable to the proposed development and / or the land as it currently is.

### 4.1. *National Environmental Management Act, Act No. 107 of 1998 (NEMA)*

NEMA requires, *inter alia*, that:

- *“Development must be socially, environmentally, and economically sustainable”*,
- *“Disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied.”*
- *“A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions”*,

NEMA also states that;

*“The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people’s common heritage.”*

#### **4.2. National Water Act (Act 36 of 1998)**

##### **Water use**

21. For the purposes of this Act water use includes—

- a. taking water from a water resource;
- b. storing water;
- c. impeding or diverting the flow of water in a watercourse;
- d. engaging in a stream flow reduction activity contemplated in section 36;
- e. engaging in a controlled activity identified as such in section 37( 1 ) or declared under section 38(1):
- f. discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- g. disposing of waste in a manner which may detrimentally impact on a water resource;
- h. disposing in any manner of water which contains waste from or which has been heated in any industrial or power generation process;
- i. altering the bed, banks course or characteristics of a watercourse;
- j. removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people: and
- k. using water for recreational purposes,

#### **4.3. National Forests Act (Act No. 84 of 1998)**

According to this act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. The prohibitions provide that;

*“No person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister.”*

Any disturbance, removal, pruning or transplanting of this species would require a licence from the administrators of the National Forests Act, who are an extension of the Department of Agriculture, Forestry and Fisheries (DAFF) based in Pietermaritzburg.

#### **4.4. National Environmental Management: Biodiversity Act (Act No. 10 of 2004)**

In terms of the Biodiversity Act, the developer has a responsibility for:

- The conservation of endangered ecosystems and restriction of activities according to the categorisation of the area (not just by listed activity as specified in the EIA regulations).
- Promote the application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all development



within the area are in line with ecological sustainable development and protection of biodiversity.

- Limit further loss of biodiversity and conserve endangered ecosystems.

#### **4.5. Conservation of Agricultural Resources (Act No. 43 of 1983) as amended in 2001**

Declared Weeds and Invaders in South Africa are categorised according to one of the following categories:

- **Category 1** *plants: are prohibited and must be controlled.*
- **Category 2** *plants: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread.*
- **Category 3** *plants: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the flood line of watercourses and wetlands.*

#### **4.6. Permit / Licence requirements**

In terms of the National Forests Act, 1998 (Act No. 84 of 1998) and Government Notice 1339 of 6 August 1976 (promulgated under the Forest Act, 1984 (Act No. 122 of 1984) for protected tree species), the removal, relocation or pruning of any protected plants will require a license.

Protected indigenous plants in general are controlled under the relevant provincial Ordinances or Acts dealing with nature conservation. In KZN the relevant statute is the 1974 Provincial Nature Conservation Ordinance. In terms of this Ordinance, a permit must be obtained from *Ezemvelo* KZN Wildlife to remove or destroy any plants listed in the Ordinance.

Of the vegetation that was recorded during our field survey only five (5) plant species which are protected by Provincial Legislation were recorded at the site and one (1) rare species was recorded along the cliff faces. The herbaceous plant species that fall under the protection of the KwaZulu-Natal Nature Conservation Management Act are listed below and fall within two Families, namely the Amaryllidaceae (*Haemanthus albiflos*, *Scadoxus membranaceus* and *Scadoxus puniceus*) and the Hyacinthaceae (*Resnova humifusa*). One tree species protected under the provincial legislation was also recorded on site namely, *Millettia grandis*. A rare succulent plant was also found on site along the cliff faces, namely *Crassula meyeri*. No forest<sup>1</sup> will be impacted upon by the proposed site development, with existing cane land and alien scrub being the only woody vegetation community that may potentially be impacted upon.

---

<sup>1</sup> (xx) "natural forest" means a group of indigenous trees -  
(a) whose crowns are largely contiguous: or  
(b) which have been declared by the Minister to be a natural forest under section 7(2): (xxviii) 15

Provincially Protected Species:

- *Haemanthus albiflos*
- *Millettia grandis*
- *Resnova humifusa*
- *Scadoxus membranaceus*
- *Scadoxus puniceus*

Two tree species protected under the National Forests Act fall within the drainage lines on the site. The plant species in this latter category were: *Barringtonia racemosa* and *Sideroxylon inerme* subsp. *inerme*.

Nationally Protected Species:

- *Barringtonia racemosa*
- *Sideroxylon inerme* subsp. *inerme*

Rare Species:

- *Crassula foveata*<sup>2</sup>

## 5. ASSUMPTIONS & LIMITATIONS

Given the receiving environment a number of assumptions and limitations are required to be recorded.

- Given the size of the property only areas which were identified in the desktop assessment as potentially having any indigenous vegetation were considered for assessment.
- Cultivation was the dominant land form and therefore these areas were not sampled in any detail;
- Many of the areas which contained indigenous vegetation are inaccessible at two levels;
  - Firstly, many of the areas are wetlands and therefore access is restricted to the periphery;
  - Secondly, certain areas were cliff faces and without the assistance of climbing equipment assessment was not possible or practical;
- The assessments could only be undertaken at a reconnaissance level given the size, access issues and the time and budgetary constraints. However, it is the specialists' opinion that this level of assessment is sufficient and provides enough information for the Competent Authority to make an informed decision thereon.
- All areas of high significance identified during the field survey have been mapped;
- The assessment was undertaken during March and April with a total of two full days being spent assessing the vegetation;
- For the areas not accessed we assumed that from being able to view them from a distance that they were of similar character to the assessed areas.

---

<sup>2</sup> Red Listed as Rare. The SANBI SIBIS website shows no records for KZN and it was described in more recent times from the Mbashe River gorge, Eastern Cape Province. It was first recorded in 2007 by D. Styles in the Inanda Valley. This is then the second record for KZN.

## 6. METHODOLOGY

### 6.1. Vegetation Sampling

The vegetation sampling was carried out over a two day split sampling period. The vegetation was identified and recorded per zone. Due to the nature of the assessment and the premise that this report will feed into the greater EIA Process the vegetation components/ areas for the most part follow the wetland nomenclature. The basis for this is that the wetland delineation and HGM Unit determination was undertaken prior to the vegetation and ecological assessment.

The majority of the species that were encountered have been identified to species, however, there are a number of plant species that were encountered, especially on the cliff faces which were not able to be fully resolved as they were not able to be assessed and / or collected by the author for identification purposes. These species have been marked with an asterisk in the species list.

### 6.2. Conservation Importance Assessment

Within the context of this vegetation assessment, conservation importance is broadly defined as the importance of the encountered vegetation communities (vegetation fragment) as a whole, in terms of the role these areas will fulfill in the preservation and maintenance of biodiversity in the local area.

Biodiversity maintenance / importance are a function of the specific biodiversity attributes and noteworthiness of the vegetation communities in question and the biotic integrity and future viability of these features.

The biodiversity noteworthiness of the system is a function of the following:

- species richness/diversity;
- rarity of the system;
- conservation status of the system;
- habitat (real or potential) for Red Data Species; and
- presence of unique and/or special features,

The integrity and future viability of the system is a function of the following:

- Extent of buffer around the system;
- Connectivity of system to other natural areas in the landscape;
- Level of alteration to indigenous vegetation communities within the system;
- Level of invasive and pioneer species encroachment system; and
- Presence of hazardous and/or obstructive boundaries to fauna.

The scores for each function of biodiversity maintenance were determined according to the scoring system shown in **Table 3** below. The scores were totaled and averaged to determine the biodiversity maintenance services score. Thereafter, the overall scores were rated according to the rating scale in **Table 4** below.

**Table 1. Biodiversity maintenance services score sheet (Template and Description)**

Biodiversity Noteworthiness	Scores				
	0	1	2	3	4
Diversity	Low	Med-Low	Medium	Med-High	High
Rarity	Low	Med-Low	Medium	Med-High	High
Conservation Status	Least Concern	Near-Threatened	Vulnerable	Endangered	Critically Endangered
Red Data	No	-	-	-	Yes
Uniqueness / Special features	None	Med-Low	Medium	Med-High	High
Integrity & Future Viability	0	1	2	3	4
Buffer	Low	Med-Low	Medium	Med-High	High
Connectivity	Low	Med-Low	Medium	Med-High	High
Alteration	>50%	25-50%	5-25%	1-5%	<1%
Invasive/pioneers	>50%	25-50%	5-25%	1-5%	<1%
Size	<1 ha	1 – 2 ha	3 - 10 ha	10 – 15 ha	>15 ha

**Table 2. Rating Scale for Biodiversity Maintenance services based on Assessment scores**

Score:	0-0.8	0.9-1.6	1.7-2.4	2.5-3.2	3.3-4.0
Rating of the likely extent to which a service is being performed	Low	Moderately Low	Intermediate	Moderately High	High

### 6.3. Biodiversity Assessment

In terms of assessing the impacts of a proposed development on the receiving environment, it is imperative that the current state of the environment is assessed and the level at which it contributes currently is considered and recorded.

It is bearing this in mind that we have developed an assessment matrix which will assist in determining the current biodiversity and conservation value of the various landscape (vegetation types) that were encountered during the field survey. In addition we need to consider the biodiversity noteworthiness of the receiving environment (i.e. does the environment hold any rare species, protected species and unique landscape features) as well as the functional integrity and future sustainability of the vegetation types in the immediate footprint of the proposed development zone.

The final condition score of each near natural feature is calculated adding the Biodiversity noteworthiness score with the Functional integrity and Sustainability score. It must be noted that the two scores are weighted 40:60% respectively. The Functional integrity and Sustainability score is assigned a greater weight, as the probability of impact is likely and the ability to mitigate future decline of the integrity of the site is desired.

## 7. DATABASE INTERROGATION / DESKTOP ANALYSIS

One of the major advantages that technology has provided is the access to information. As a result of this and the ongoing pursuance of environmental knowledge, databases which can be interrogated to provide general information regarding the site have been developed.

This information in turn potentially records what may occur on the site and the sites value from a regional / provincial perspective in terms of conservation and biodiversity. The caveat here is that the majority of these databases are created at the landscape level. In addition, the factors which are often utilized to determine many of the outputs are related to abiotic characteristics, such as rainfall, temperature, soil types, underlying geology, elevation and aspect. The result therefore is the development of a database that provides a high level assessment of the area, which requires substantial ground-truthing to illustrate the various components that comprise the landscape. The field survey will highlight areas of conservation significance and biodiversity richness as well as provide information regarding the *status quo* and what will be required in terms of management to ensure improvement in the *status quo* and ensure the limited long term impacts being imparted. A number of databases have been interrogated in the process of undertaking the Desktop Analysis. A summary of the methodology utilised for the generation of each of the databases, as well as the pertinent results for each are included below under the various titled sub-sections.

### **7.1. Ezemvelo KZN wildlife C-Plan & SEA Database**

The C-Plan is a systematic conservation-planning package that runs with the GIS software ArcGIS, which analyses biodiversity features and landscape units. C-Plan is used to identify a national reserve system that will satisfy specified conservation targets for biodiversity features (**Lombard et al. 2003**). Biodiversity features can be land classes or species, and targets are set in area units either for land classes, or as numbers of occurrences of species for species locality data sets (**Lombard et al. 2003**). These units or measurements are used as surrogates for un-sampled data. The C-Plan is an effective conservation tool when determining priority areas at a regional level and is being used in South Africa to identify areas of high conservation value.

#### **7.1.1. Irreplaceability Analysis**

The following is referenced from **Goodman (2004)**: “The first product of the conservation planning analysis in C-Plan is an irreplaceability map of the planning area, in this case the province of KwaZulu-Natal. This map is divided into 1 by 1 km grid cells called ‘Planning Units’.

Each cell has associated with it an ‘Irreplaceability Value’, which is a reflection of the cells’ importance with respect to the conservation of biodiversity. Irreplaceability reflects the planning unit’s ability to meet set ‘targets’ for selected biodiversity ‘features’. The irreplaceability value is scaled between 0 and 1.

**Irreplaceability value – 0.** Where a planning unit has an irreplaceability value of 0, all biodiversity features recorded here are conserved to the target amount, and there is unlikely to be a biodiversity concern with the development of the site.

**Irreplaceability value – 1.** These planning units are referred to as totally irreplaceable and the conservation of the features within them is critical to meet conservation targets. (EIA very definitely required and depending on the nature of the proposal unlikely to be granted).

**Irreplaceability value > 0 but < 1.** Some of these planning units are required to meet biodiversity conservation targets. If the value is high (e.g. 0.9) then most units are required (few options available for alternative choices). If the value is low, then many options are available for meeting the

biodiversity targets. (EIA required and depending on the nature of the proposed development, permission could be granted).”

### 7.1.2. C-Plan Biodiversity Features / Species within Project Area

In terms of the desktop analysis undertaken, the site is classified as 0 - 0.2, i.e. slightly irreplaceable. The Minset analysis mirrors the C-Plan data with the irreplaceable area being deemed a Negotiated Reserve.

There is one feature present on the site which is considered to be of environmental significance and conservation importance:

Vegetation Type – Moist Coastal Forest, Thorn and Palm Veld

### 7.1.3. KZN Wildlife SEA

In terms of the SEA data generated, through the physical characteristics that are present on site, a number of groups have been identified as potentially present on the site, and these groups are wholly significant in terms of conservation significance or parts thereof. The Table below identifies which groups are significant.

**Table 3. SEA Data taken from Ezemvelo KZN Wildlife**

YES	NO
Avi-faunal	Mammals
Frogs	Vegetation - Forests
Medicinal Plants	Vegetation - Grasslands
Reptiles	Protected Plants
Invertebrates	
Vegetation - Wetlands	

## 7.2. Bio Resource Units

In terms of Camp, 1998, there are is one Bio Resource Unit for the site. The general characteristics of each are as follows:

Ya14 -

Bioresource Group 1: Moist Coastal Forest, Thorn and Palm Veld

BRG Subgroup 1.3

**Vegetation pattern:** The vegetation is primarily bushed grassland and bushland thicket.

**Indicator Species:** *Acacia karroo*, *Acacia mearnsii*, *Acacia nilotica*, *Acacia robusta*, *Acacia sieberiana*, *Albizia adianthifolia*, *Aristida junciformis*, *Combretum* spp., *Digitaria eriantha*, *Hyphaene natalensis*, *Lantana camara*, *Panicum maximum*, *Phoenix reclinata*, *Pteridium aquilinum*, *Sclerocarya birrea*, *Strelitzia nicolai*, *Syzygium cordatum*

The rainfall average is 973 mm of per annum. The mean temperature is 20.5 °C and the climate rating is C1, Local climate is favourable for good yields for a wide range of adapted crops throughout the year. There is no frost hazard and the erosion rating for the site is 3.9, which translates to a high risk of erosion.

There are nine (9) perennial rivers and one (1) annual river for this BRU. The named perennial rivers are as follows: Mdloti, Mgeni, Mhlali, Mvoti, Nonoti, Ohlanga, Tongati and Tugela River. Please note there are a number of drainage lines, non-perennial streams and wetlands that are not captured at the coarse level at which this data has been defined.

**Table 4. North Coast climate table**

	Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>RAINFALL</b>													
Median rainfall (mm)		11	110	10	5	27	1	14	2	56	8	101	108
Mean rainfall (mm)	973	12	127	11	7	55	3	26	4	68	9	111	110
<b>TEMPERATURE</b>													
Mean (°C)	20.5	23	24	23	21	19	16	16.5	17	19.1	20	21.4	23.1
Maximum (°C)	25.5	28	28.3	27	26	24.7	22	22.7	23	24.1	24	25.7	27.6
Minimum (°C)	15.5	19	19.7	18	16	13.3	10	10.3	11	14.1	15	17.1	18.7
<b>EVAPORATION</b>													
A-pan (mm)	1692	17	161	15	12	108	9	100	11	134	16	166	188
<b>SUNSHINE</b>													
Hours/day (Oct-Mar)	6												
Mean annual (hours)	6.5												

### **7.3. Environmental Potential Atlas**

The following is referenced from the Department of Environmental Affairs and Tourism (2007): The Environmental Potential Atlas (ENPAT) developed from a single map of Gauteng to a complete spatial data set of the entire South Africa.

ENPAT was updated in July 2001 and is used by the National Department of Environmental Affairs and Tourism and various provincial environmental management departments as a decision-making tool in the process of environmental impact assessments. ENPAT includes the decision-making parameters such as: high-risk development category indications and potential impacts are linked to the 1:250 000 spatial databases on national and provincial level.

The main purpose of ENPAT is to proactively indicate potential conflicts between development proposals and critical or sensitive environments. ENPAT can also be used for development planning since it indicates the environment's potential for development.

ENPAT consists of two distinct, parallel sets of information: natural or environmental characteristics, and social-economic factors. The environmental character maps depict geology, land types, soils, vegetation, and hydrology. The socio-economic factors consist of land cover, cadastral aspects and infrastructure, land use and culture.

These two sets of information are combined and assessed in terms of their potential or latent environmental sensitivity. Sensitivity is assigned based on the ability of a resource to absorb change or impact. A value of **0** indicates a **low sensitivity** - thus a high ability to accept change and a value of **1** indicates a **high sensitivity**, or a low ability to accept change. Areas of low sensitivity are thus available or suitable for development.

The ENPAT data provides the following information about the site:

### 7.3.1. Soils and Geology

The geology of the large majority of the site is comprised mainly of Shale, which is not sensitive to disturbance and development and small areas of Tillite, which is not sensitive to disturbance and development. Small portions of the southern and south-western part of the site have soils that are dominated by Glenrosa and / or Mispah Forms which have a low sensitivity to disturbance, and can accept development well, while a small portion of the South-eastern part of the site is comprised mainly of Red dune cordon sand which has a low sensitivity to disturbance, and can accept development well.

### 7.3.2. Mucina and Rutherford's Vegetation Assessment

KwaZulu-Natal (KZN) province is rich in natural diversity. In terms of vegetation, the site falls within the Indian Ocean Coastal Belt.

In terms of the vegetation on site, the general classification is made at a very coarse scale, i.e. low resolution and falls within the KwaZulu-Natal Coastal Belt vegetation type:

#### **KwaZulu-Natal Coastal Belt**

##### 7.3.2.1. Distribution

KwaZulu-Natal Province: Long and in places broad coastal strip along the KwaZulu-Natal coast, from near Mtunzini in the north, via Durban to Margate and just short of Port Edward in the south. Altitude ranges from 20-450 m.

##### 7.3.2.2. Conservation

The vegetation type is considered **Endangered**. The conservation target of 25%. Only a very small part is statutorily conserved in Ngoye, Mbumbanzi and Vernon Crookes Nature reserves.

##### 7.3.2.3. Threats

About 50% transformed for Cultivation, by urban sprawl and for road-building. Alien plant species include; *Chromolaena odorata*, *Lantana camara*, *Melia azedarach*, and *Solanum mauritianum*. Erosion is low to moderate.

##### 7.3.2.4. Indicative Plant Species

**Small Trees and Tall Shrubs:** *Bridelia micrantha* (d), *Phoenix reclinata* (d), *Syzygium cordatum* (d), *Acacia natalitia*, *Albizia adianthifolia*, *Antidesma venosum*.



**Low shrubs:**

*Clusia pulchella*, *Gnidia kraussiana*, *Phyllanthus glaucophyllus*, *Tephrosia polystachya*.

**Woody climbers:**

*Abrus laevigatus*, *Asparagus racemosus*, *Smilax anceps*.

**Graminoids:**

*Aristida junciformis* subsp. *galpinii* (d), *Digitaria eriantha* (d), *Panicum maximum* (d), *Themeda triandra* (d), *Alloteropsis semialata* subsp. *eckloniana*, *Cymbopogon caesius*, *Cymbopogon nardus*, *Eragrostis curvula*, *Eulalia villosa*, *Hyparrhenia filipendula*, *Melinis repens*.

**Herbs:**

*Berkheya speciosa* subsp. *speciosa* (d), *Cyanotis speciosa* (d), *Senecio glaberrimus* (d), *Alepidea longifolia*, *Centella glabrata*, *Cephalaria oblongifolia*, *Chamaecrista mimosoides*, *Conostomium natalense*, *Crotalaria lanceolata*, *Dissotis canescens*, *Eriosema squarrosum*, *Gerbera ambigua*, *Hebenstretia comosa*, *Helichrysum cymosum* subsp. *cymosum*, *Helichrysum pallidum*, *Hibiscus pedunculatus*, *Hybanthus capensis*, *Indigofera hiliaris*, *Pentanisia prunelloides* subsp. *latifolia*, *Senecio albanensis*, *Senecio bupleuroides*, *Senecio coronatus*, *Senecio rhyncholaenus*, *Sisyranthus imberbis*, *Stachys aethiopica*, *Stachys nigricans*, *Vernonia galpinii*, *Vernonia oligocephala*.

**Geophytic Herbs:**

*Bulbine asphodeloides*, *Disa polygonoides*, *Hypoxis filiformis*, *Ledebouria floribunda*, *Pachycarpus asperifolius*, *Schizocarphus nervosus*, *Tritonia disticha*.

**Low shrubs:**

*Ceropegia sandersonii*.

**Biogeographically important Taxon** (Coastal belt element, Southern distribution limit)**Graminoids:**

*Cyperus natalensis*, *Eragrostis lappula*.

**Small Tree and Tall shrubs:**

*Anastrabe integerrima* (d), *Acacia nilotica* subsp. *kraussiana*.

**Shrubs:**

*Helichrysum kraussii*, *Agathisanthemum bojeri*, *Desmodium dregeanum*.

**Herbs:**

*Helichrysum longiflorum*, *Selago tarachodes*, *Senecio dregeanus*, *Sphenostylis angustifolia*.

**Mega-herb:**

*Strelitzia nicolai* (d).

**Geophytic Herb:**

*Kniphofia gracilis*, *Kniphofia littoralis*, *Kniphofia rooperi*, *Pachystigma venosum*, *Zeuxine africana*.

**Geoxylic Suffrutices:**

*Ancylobothrys petersiana*, *Eugenia albanensis*, *Salacia kraussii*.

**Endemic Taxa:****Herb:**

*Vernonia africana* (extinct).

**Geophytic herb:**

*Kniphofia pauciflora*.

## 8. VEGETATION ON SITE

### 8.1. General Vegetation Statement

The vegetation that was sampled on site was typical of the vegetation that would be expected to occur on Dwyka Tillite soils, in particular dry steep and incised valley lines, which are often associated with rock faced cliffs. The vegetation for the most part in these areas remains relatively undisturbed as the accessibility onto these areas is highly restricted (**Plate 1**). The receiving environment is also considered to be quite hostile for the establishment of plants which have not evolved to fill these niche environments. The soils are shallow and nutrient poor as they are recently derived from rock, the steep slopes don't support the development of any organic material layer for the sustained development of the vegetation. Further these areas were never transformed and therefore the plant species assemblage is relatively old with many large and well established trees. Portions of these areas remain relatively pristine, with the understory complementing the woody and shrubby vegetation component, but in other areas the under-storey is highly invaded by alien plant species.



**Plate 1. Issues around the ability to sample areas due to the sheer rock faces encountered and the scree slopes.**

In the Open Valley Bottoms that have not been drained and planted to monoculture, the vegetation is far more transformed, with the most prevalent species being alien invasive species, alien species and indigenous invader species. Numerous pioneer and ruderal species were also recorded. For the ease of reference and due to the relatively similar characteristics displayed by the indigenous invader, as

well as the pioneer<sup>3</sup> and ruderal<sup>4</sup> species they have been combined and will be discussed as a single categorization<sup>5</sup>.

## **8.2. HGM Unit 1**

The first drainage line that was encountered had been highly transformed. At the head of the wetland system the vegetation was non woody in nature and was dominated by graminoid and sedge species. The presence of alien species was also noted, however, they were less prevalent than further down the wetland system. In addition the alien species were in an isolated pocket of the upper wetland. The most prevalent indigenous obligate wetland species were *Phragmites australis*, *Cyperus dives*, *Cyperus latifolius* and *Ludwigia octovalvis*. This area represented in **(Plate 2)** also contained some species such as *Paspalum urvillei*, which are often associated with wet areas; however they are not restricted to wet areas.

The presence of the road has resulted in the wetland system back-flooding as a result of the attenuation created by the road. The creation of a wider and larger more open area, which is reflected in the presence of a seasonal wetland area, has developed, facilitating the presence of the above mentioned species.

Below the contour cane road and for the remainder of the wetland system, the vegetation is dominated by woody species. In the upper reaches the most dominant woody species are comprised of indigenous tree species which have been planted on either side of the central drainage channel **(Plate 3)**.

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<sup>3</sup> Pioneer species are species which colonize previously un-colonized land or disturbed land, usually leading to ecological succession. Since un-colonized land usually has thin, poor quality soils with few nutrients, pioneer species are typically very hardy plants with adaptations such as long roots, root nodes containing nitrogen-fixing bacteria, and leaves that employ transpiration. The plants, or anything that has the system of a plant, will be specially adapted to the extremes that may be experienced, and once they have modified the environment may be out-competed by less specific plants, eventually leading to a climax community. Pioneer species can also be found in secondary succession (an established ecosystem being reduced by an event such as a forest fire or a clearing), colonizing newly created open spaces quickly.

<sup>4</sup> A ruderal species is a plant species that is first to colonise disturbed lands. The disturbance may be natural (e.g., wildfires), or due to human influence - constructional (e.g., road construction, building construction or mining), or agricultural (e.g., abandoned farming fields or abandoned irrigation ditches). Ruderal species typically dominate the disturbed area for a few years, gradually losing the competition to other native species.

<sup>5</sup> Depending on the manner in which the species are viewed or how the individual author interprets the species and their presence will depend on what category they may fall into. However it must be noted that many of the plant characteristics underpinning the three different categories are the same.



**Plate 2.** More Open and less woody wetland system at the head of a catchment. Sedges and Graminoid species are dominant. Note the isolated pocket of alien woody vegetation in the background, comprised predominantly of *Schinus terebinthifolius*.



**Plate 3.** *Syzygium cordatum* tree species planted along the drainage channels, historically.

In the vicinity of **GPS PT. 317 (Map 2)** the entire understory has been cleared of alien vegetation. However, as a result of the seed bank present and the colonisation ability of alien species has resulted in a number of early successional herbaceous aliens colonising the understory (**Plate 4**).

The most prevalent woody species is *Syzygium cordatum* which has been planted for a good proportion of the wetlands length. We would propose that the planted *Syzygium cordatum* trees extend to a point just north of the quarry marked at **GPS PT. 337 (Map 2)**. In areas where the understory has not been cleared the vegetation is dominated by alien invasive plant species. A number of indigenous species are present however; they are restricted in their abundance and distribution to localized pockets along the drainage line.

The following indigenous species were encountered within the upper / northern section of the wetland system; *Phoenix reclinata*, *Clerodendrum glabrum*, *Ficus sur*, *Erythrina lysistemon*, *Halleria lucida*, *Ficus burkei* and *Bridelia micrantha*.



**Plate 4. Early successional Herbaceous Alien Species.**

From just north of the Quarry heading in a southerly direction, the species assemblage and dominance changes from *S. cordatum* to *Schinus terebinthifolius* dominated areas. Within this matrix of woody plant species, the understory was poorly developed. In many areas, the *S. terebinthifolius* was interspaced with *Melia azedarach*, *Psidium guajava* and *Solanum mauritianum*. Other alien species were present, however, they were not considered to be as abundant. This category of plant comprised species such as, *Albizia lebbbeck* and *Spathodea campanulata*. In addition to the woody species, one creeper species was extremely prevalent, namely; *Ipomoea purpurea*. Limited abundances of *Passiflora foetida*, *P. suberosa* and *P. subpeltata* were also encountered. A number of

herbaceous alien species were encountered within the “cordon” of the drainage line. The most abundant species were *Canna indica*, *Ageratum conyzoides* and *Crotalaria juncea*.

In terms of the indigenous woody elements there were very sparsely distributed along the length of the drainage line. Certain species were slightly more common than others. The interesting observation that was made was that *Ficus lutea*, formed isolated monotypic stands within the drainage line **GPS PT. 336 (Map 2)**. Other indigenous species that were encountered were; *Clerodendrum glabrum*, *Ficus sur*, *Trema orientalis*, *Erythrina lysistemon* and *Strelitzia nicolai* all exhibited a far more random distribution throughout the drainage line.

As one approaches **GPS PT. 335 (Map 2)** the drainage line becomes far more canalized. In this area the drainage line is restricted to a rock shelf lined “stream” (**Plate 5**). The vegetation reflected in this area is as a result of the steep slopes associated with the incised channel. The woody plant species have been able to relax the very defined and restricted boundary and expand outwards as a result of the inability for agriculture to be pursued on these slopes.



**Plate 5.** An igneous intrusion over which the stream flows, possibly Doleritic in nature.

The woody vegetation on these slopes may be described and categorized as dry riverine thicket. The slopes have a very shallow layer of soil that overlays a rock layer. In this particular area on the site the rock appears to be derived from Dwyka Tillite.

The most common woody species that were recorded in this area and extending towards the heavy grouping of *Millettia grandis* (see attached **Map 1** enclosed at **Appendix 2**) were *Allophylus africanus*,

*Apodytes dimidiata*, *Bridelia micrantha*, *Canthium ciliatum*, *Clausena anisata*, *Combretum erythrophyllum*, *Commiphora woodii*, *Cordia caffra*, *Cussonia zuluensis*, *Dalbergia armata*, *Dalbergia obovata*, *Ekebergia capensis*, *Ficus burkei*, *Halleria lucida*, *Hippobromus pauciflorus*, *Kraussia floribunda*, *Pavetta lanceolata*, *Psydrax locuples*, *Putterlickia verrucosa*, *Scolopia zeyheri*, *Turraea floribunda*, *Trimeria grandifolia* and *Ziziphus mucronata*. In terms of the herbaceous under-storey and creepers the following species were prevalent; *Aneilema aequinoctiale*, *Asparagus virgatus*, *Commelina eckloniana*, *Dioscorea cotinifolia*, *Dicliptera heterostegia*, *Distephanus anisochaetoides*, *Flagellaria guineensis*, *Haemanthus albiflos* (**Plate 6**), *Justicia petiolaris*, *Justicia protracta*, *Kalanchoe rotundifolia* (**Plate 7**), *Pupalia lappacea*, *Rhinacanthus gracilis* var. *gracilis*, *Rhoicissus tridentata*, *Sarcostemma viminale* (**Plate 8**) and *Sansevieria hyacinthoides*.



Plate 6. *Haemanthus albiflos*



Plate 7. *Kalanchoe rotundifolia*

The above mentioned species are common to other areas that were sampled on the Cornubia north site. These species are all typical and indicative of Xeric riverine thicket, verging on Scarp Forest in places.



Plate 8. *Sarcostemma viminalis* in flower.

### 8.3. HGM Unit 2

This portion of the site is highly transformed with the wetland system and central drainage channel being highly incised. In many areas along the drainage line the wetland soils have been eroded to such an extent that the water is now flowing over rock sheets which underlay the soils historically. In addition, the central channel has resulted in the narrowing of the HGM Unit, and thus a narrowing of the associated riparian zone. In the upper reaches of this particular HGM unit the wetland area has been planted to sugarcane. A narrow channel has developed as a result of the activities taking place on either side of this channel. The vegetation is limited with a couple of woody species having been planted / established randomly along it. The soils are highly erodible given their sandy nature and the farm manager has made an effort at conserving the soil. Along the steeper sections of the HGM Unit rows of *Chrysopogon zizanioides* (Vetiver Grass) have been planted to stabilize the soils and to catch any sediment that is moving through the system during overland flow events (**Plate 9**).





**Plate 9.** *Chrysopogon zizanioides* utilised to stabilise soils and collect dissolved particulate matter.

As one moves down the HGM Unit it becomes more canalized and has steep sided slopes associated with it. In these areas the woody vegetation is more dominant. The most prevalent species are alien invasive species most notably, *Schinus terebinthifolius*, *Morus alba*, *Sesbania bispinosa*, *Psidium guajava* and *Melia azedarach*. Very limited indigenous woody species were encountered along the riparian corridor. However, where the slopes adjacent the riparian zone were too steep to receive agriculture indigenous woody vegetation was more common. However, where the HGM Unit was highly incised and bank stabilization was required, Bamboo had been planted to protect the banks.

Within the drainage channel and associated riparian corridor a single *Millettia grandis* individual was recorded. At **GPS PT. 339 (Map 2)**, species, such as, *Celtis africana*, *Acacia natalitia*, *Trimeria grandifolia*, *Turraea floribunda*, *Acalypha glabrata*, *Apodytes dimidiata*, *Kraussia floribunda* and *Pavetta lanceolata* were recorded. A roadway runs parallel with this HGM Unit and on the opposite side of the road the steep slopes have not been cultivated. This area is dominated by alien vegetation, however there are some indigenous plant species occurring within this area, namely; *Clerodendrum glabrum* and *Sideroxylum inerme*, the latter being significant in that it is protected by the National Forests Act. A total of five individuals were found within this area, all of which are well established mature trees.

Below **GPS PT. 339 (Map 2)** region the topography is such that the HGM Unit is able to be less incised and the boundary of the wetland has thus relaxed. The vegetation has also changed in response to the change in the hydrology, and is now dominated by Sedges and Graminoid species (**Plate 10**). The most prevalent species is *Phragmites australis*. In addition, and of concern is the presence of species such as, *Ipomoea purpurea* and *Schinus terebinthifolius* that are encroaching into this area and are in some places smothering the *P. australis*.



Plate 10. Wetland areas dominated by graminoid and sedge species, most notably *Phragmites australis*.

In terms of the indigenous vegetation and non-cultivated areas of the site, they separate from this point with the vegetation being restricted to the central incised channel of the HGM Unit and then to the steep sided slopes which are removed from the wetland area. In these areas the most common plant species are alien in nature, with *Melia azedarach* being abundant. To a lesser degree species such as *Leucaena leucocephala*, *Arundo donax*, *Solanum mauritianum*, *Chromolaena odorata*, *Canna indica*, *Ricinus communis* and *Pisum guajava* were also recorded in varying abundances. Two very large *Syzygium cumini* trees were recorded and are marked on **Map 2** attached at **Appendix 2** Where HGM Unit 2 feeds into the floodplain a small *Barringtonia racemosa* was recorded. This individual appears to have been planted, however this species is afforded protection under the National Forests Act.

#### **8.4. HGM Unit 3**

This water resource unit is the largest unit outside of the Ohlanga Floodplain. This unit is large and captures a significant amount of the overall run-off from the site and from the adjacent Waterloo community area. This area is highly transformed, not as a result of cultivation, but as a result of its position within the landscape and the fact that it is not as steep and incised as the remainder of the HGM Units in its upper portion (**Plate 11**).



Plate 11. Typical view of the upper portion of the HGM Unit 3 vegetation assemblage.

The vegetation is generally dominated by alien invasive species. A number of indigenous species are present however; they are limited in their abundances and will not be of a significant quantity to form the basis for any rehabilitation process. The most commonly occurring indigenous species were *Bridelia micrantha*, *Ficus natalensis* and *Protorhus longifolia*. Less prevalent but tree species that were recorded were *Apodytes dimidiata*, *Searsia chirindensis*, *Trema orientalis*, *Ficus sur* and *Syzygium cordatum*. One individual of *Strychnos usambarensis* was recorded. The remainder of the vegetation is dominated by *Melia azedarach*, *Schinus terebinthifolius*, *Litsea glutinosa* and *Solanum mauritianum*. The following species are abundant but not dominant; *Leucaena leucocephala*, *Senna bicapsularis*, *Senna didymobotrya*, *Schinus terebinthifolius*, *Tithonia diversifolia*, *Montanoa hibiscifolia*, *Agave sisalana* and *Musa* cultivar.

Numerous creeper species were also commonly occurring within this unit. The creeper species are not restricted to either alien or indigenous species. The most common creeper species were: *Ipomoea purpurea* an alien species with *Ipomoea cairica*, *Desmodium incanum*, *Rhynchosia caribaea* and *Hewittia malabarica* commonly occurring along the terrestrial margins of the HGM Unit.

As with **HGM Unit 2** there are areas where the steep slopes are such that cultivation has not been able to be undertaken and these areas have remained as isolated fragments, along road ways or in areas that are inaccessible. These areas appear to be restricted to Dwyka Tillite slopes and therefore for the majority of the site they are similar in terms of their species assemblage. In this particular area adjoining **HGM Unit 3** the most common woody species are *Dombeya cymosa*, *Commiphora woodii*, *Searsia chirindensis*, *Allophylus africanus*, *Apodytes dimidiata*, *Psydrax locuples*, *Grewia occidentalis*, *Gymnosporia buxifolia*, *Scolopia zeyheri* and *Dalbergia obovata*. Given the relatively “open” nature of the canopy a well-established and relatively diverse under-storey was recorded. The under-storey

unlike in areas where the canopy is denser was dominated by more woody herbs and shrubs. The most common species were *Jasminum* sp., *Barleria gueinzii* (**Plate 12**), *Pupalia lappacea*, *Asparagus lariginus*, *Rhinacanthus gracilis* var. *gracilis* and *Distephanus anisochaetoides*.



Plate 12. *Barleria gueinzii* growing and flowering in profusion.

### **8.5. Area 4 – Lower reaches of HGM Unit 1 & Xeric Riverine Thicket**

This area is highly diverse given the topographical range that the plant species occur across. From the lower reaches of the HGM Unit to the upper portion of the hill is approximately 60 metres in vertical elevation. The result being that the lower portions are extremely moist and are reflective of riparian coastal forest, with the upper portions of the slopes above the cliff face being dominated by species associated with Xeric Conditions, as the soils are shallow and friable. In addition the slopes are east / north facing slopes which result in the presence of species such as *Euphorbia* sp., *Dombeya cymosa*, *Cussonia zuluensis*, *Euclea daphnoides*, *Scolopia zeyheri*, *Putterlickia verrucosa*, *Schotia brachypetala* and *Searsia nebulosa*.

These woody areas are diverse and the species list for the individual areas is included at **Appendix 1** for ease of reference. There is a significant stratification of these areas with the taller woody species creating the ideal micro-climatic conditions for the development of an under-storey which contains species such as *Scadoxus membranaceus* a provincially protected plant species.

Overall the vegetation in this area is considered to be of a good quality<sup>6</sup> as the presence of aliens is relatively low and restricted for the most part to the periphery of the woody fragment. In addition, the diversity is high and a number of protected plant species are recorded within this area.

### **8.6. Area 5 – Scarp Forest with Xeric Riverine Thicket Elements**

The vegetation in this area is classed from high quality undisturbed Scarp Forest with Xeric Riverine Thicket elements (**Plate 13**) to relatively transformed vegetation (**Plate 14**) which still exhibits elements of its former categorization. Finally an area, which bisects the woody vegetation which is dominated by alien invasive species (**Plate 15**), retaining limited indigenous species.



**Plate 13. Xeric Riverine Thicket with Scarp Forest elements.**

The Scarp Forest with Xeric Riverine Thicket elements is relatively well preserved. The underlying reason for this preservation is that the opportunity for cultivation of these areas is nil. The only impacts that are currently being imparted are; roadways that run on the upper portion of the Scarp and the along the Ohlanga floodplain, and the presence of alien invasive vegetation in pockets within the forest and along the periphery. The presence of aliens may be ascribed to the continual disturbance that is being imparted on the ecotone by the presence of roadways and the commercial agriculture taking place adjacent to this fragment. Two areas which are more transformed are a centralized area of approximately 60 metres wide, which is dominated by alien invasive vegetation. Having assessed the area we would postulate that some stochastic event had occurred which has resulted in the shift in the forest dynamic equilibrium. Two possible sources of disturbance are; a rock

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<sup>6</sup> The vegetation if an alien management programme is implemented will be able to sustain itself with limited anthropogenic influence. The vegetation fragment may contribute to the provision of refugia for faunal species and provide roosting and nesting sites for avi-faunal species.

fall or a runaway fire that has been able to penetrate through the ecotone and enter the core of the forest. The other area which exhibits higher levels of alien invasive species occupies the most western portion of the forest which is less steep and thus the receiving environment is likely more susceptible to invasion as the conditions are more suited to alien invasive species. Alien species are well adapted to respond rapidly to any changes in the immediate environment.



**Plate 14.** The forest area which is less steep and has higher levels of aliens than the steepest sections.

The vegetation within this area has some unique elements and some elements reflective of Scarp Forest. Species such as *Aloe pluridens* were relatively common on the cliff faces. Other species which were common and indicative of Scarp Forest in the Durban area were *Commiphora woodii*, *Obetia tenax*, *Stellarioides longibracteatum*, *Combretum bracteosum* and *Sarcostemma viminale*. Numerous protected plant species were identified in the forest areas, with the most notable species being *Sideroxylum inerme* (tree) and numerous herbaceous plant species and succulents such as; *O. longibracteatum*, *Resnova humifusa*, *Haemanthus albiflos*, *Scadoxus puniceus* and *Scadoxus membranaceus*. One species of conservation significance and a highly restricted distribution, *Crassula foveata* (**Plate 16 & 17**) was found growing in large clusters on the cliff faces. The SANBI SIBIS website shows no records for KZN and it was described in more recent times from the Mbashe River gorge, Eastern Cape Province. Styles has found it along a tributary of the Mzimvubu and then in the Inanda Valley, inland of Durban. This record was also reported in **PlantLife 36**: "*Crassula foveata* – a new provincial record for KwaZulu-Natal" in 2007. This is then the second record for KZN.



Plate 15. Alien vegetation that has established in an approximately 60 metre wide ribbon through the forest.



Plate 16. *Crassula foveata* found growing on Dwyka Tillite cliff faces.



Plate 17. Typical exposed cliff face on which *C. foveata* was growing.

In terms of the under-storey numerous woody herbaceous plant species, creepers and herbaceous plants were quite common. The following notable species were seen; *Petopentia natalensis*, *Dietes iridoides*, *Dicliptera heterostegia*, *Justicia campylostemon* and *Justicia petiolaris*. In many portions across the steeper portions of the area *Acacia schweinfurthii* (a creeping Acacia species) was prevalent and should be considered as an indigenous invasive species which is capable of smothering trees and diminish the diversity and conservation significance of these areas.

On the less severe slopes the woody species assemblage is quite different. Some of the common trees were; *Allophylus africanus*, *Calpurnia aurea* subsp. *aurea*, *Canthium ciliatum*, *Chaetachme aristata*, *Cussonia zuluensis*, *Cryptocarya woodii*, *Dombeya rotundifolia*, *Cordia caffra*, *Clerodendrum glabrum*, *Ficus burkei*, *Searsia chirindensis*, *Searsia pyroides* var., *Maytenus peduncularis* *Ochna natalitia*, *Scolopia zeyheri* and *Putterlickia ventricosa*.

### **8.7. Area 6 – Roadway leading to Farm Managers Dwelling and Dwelling Area**

This area even though it would have been historically all planted to an avenue of *Eucalyptus grandis*, this has facilitated over a long period on no management the establishment and development of an indigenous vegetation component, both herbaceous and woody. The value of this area is limited due to its overall size and the fact that the dominant species are alien species. Some of the indigenous species that were encountered were: *Apodytes dimidiata* (common), *Canthium inerme*, *Diospyros lycioides*, *Ficus sur*, *Gymnosporia buxifolia*, *Hippobromus pauciflorus*, *Phoenix reclinata*, *Protorhus longifolia*, *Schotia brachypetala* and *Trichilia emetica*.



### **8.8. Area 7 – Isolated Woody Fragment along Sugar Cane Road perpendicular to the M27**

This portion of the site is a typical of bushed thicket common in drier areas and occurring on Dwyka Tillite soils. The vegetation is Xeric in nature and has a few *Acacia* species present within the assemblage. The vegetation is typically not tall like coastal forest, with the largest trees not being more than 7 metres in height. The vegetation is for the most part indigenous and provides limited ecological value, as it is an isolated fragment in the landscape and is bounded by roads on either side. The potential for expansion of this area is dependent on the future layout plans that have been proposed for the greater Cornubia North Site. Only one provincially protected plant species was encountered, namely, *Scadoxus puniceus*. The following tree species were common, however, the diversity was greater than the species recorded hereafter; *Acacia natalitia*, *Acokanthera oppositifolia*, *Allophylus africanus*, *Apodytes dimidiata*, *Cadaba natalensis*, *Clausena anisata*, *Coddia rudis*, *Grewia occidentalis*, *Kraussia floribunda*, *Maytenus peduncularis*, *Putterlickia verrucosa*, *Turraea floribunda* and *Zanthoxylum capense*. A number of herbaceous and shrubby species were also present and created a two level stratification. The following were common; *Barleria gueinzii*, *Carissa bispinosa*, *Distephanus anisochaetoides*, *Hypoestes aristata* and *Sansevieria hyacinthoides*.

Given this portion of the sites proximity to a relatively large road, litter and illegal dumping was prevalent. The impact of illegal dumping is significant particularly when it occurs within natural vegetation as it is often the facilitator for more dumping.



**Plate 18. *Acokanthera oppositifolia* growing in amongst the other tree species.**



Plate 19. *Maytenus peduncularis* fruiting body.



Plate 20. *Sansevieria hyacinthoides* (mother-in-laws-tongue).

### **8.9. Area 8 – HGM Unit 4**

This area like most of the HGM Units on site is relatively narrow and is cordoned off on both sides by roadways and or cultivation. Towards the upper section of the catchment and away from the HGM Unit *per se* the side slope is infested with *Eucalyptus grandis*. Within the ribbon of non-cultivated vegetation that runs the length of the HGM Unit area few indigenous plant species but for the most part the area is dominated by alien invasive species.

### **8.10. Area 9 – Ohlanga Floodplain**

The Ohlanga floodplain is highly transformed and dominated by alien invasive vegetation. Bamboo, utilised historically as a bank stabilizer has formed homogenous stands along the entire length of the Cornubia North site, where it is bounded by the Ohlanga River. Interspersed with these stands are numerous areas dominated by *Melia azedarach*. *Arundo donax* is common within the water course itself and once the elevation and the habitat becomes more terrestrial, *Albizia adianthifolia* is growing alongside the roadway. The Ohlanga River is choked with *Setaria sagittifolia*. Large portions of the vegetation on either side of the actual channel are covered by *Passiflora suberosa* and *Ipomoea purpurea*.

## **9. CURRENT IMPACTS**

### **9.1. Alien vegetation encroachment**

Across the site there are fragments of woody vegetation that still have intrinsic biodiversity value. These areas are predominantly restricted to steep slopes and inaccessible areas, not deemed suitable or optimal for the production of sugar cane. As a result, the areas have received less attention and the lack of management has resulted in the establishment of alien invasive vegetation. Given the sensitivity of certain portions of the site, the indigenous plant reservoir is currently being eroded by alien invasive species.

Alien invasive species exhibit all or most of the following characteristics, which makes them the most opportunistic and successful plant species, when they are given a chance to establish as a result of disturbance or changes to the ecological state of an area.

- Fast growth
- Rapid reproduction
- High dispersal ability
- Phenotypic plasticity (the ability to alter growth form to suit current conditions)
- Tolerance of a wide range of environmental conditions (Ecological competence)
- Association with humans
- Prior successful invasions

These characteristics therefore make alien plant control onerous and highly expensive. Further managing and destroying infestations is made exceedingly difficult as not all landowners are able to or have the relevant knowledge to understand and control these species. Bearing this in mind, an alien plant management plan must be considered a priority on the site, particularly in **Areas 4 and 5**.

## **9.2. Cultivation**

The cultivation of the adjacent areas does have a significant impact on the remaining natural areas. These include regularly exposure to events such as, pruning of trees, as they grow into the roadway, the cutting of the vegetation to allow for access into the cultivated fields, the use of these naturalized areas to control run away fires during burning of the sugarcane. Additionally, sugarcane burns at a far higher temperature than natural grass and thus the ecotone is exposed to significant heat which has an impact on its resilience and ability to resist fire intrusions, as it is not adapted to withstand these exceedingly high temperatures.

## **9.3. Illegal Dumping**

Illegal dumping appears to occur on all sites that one visits in close proximity to any urban area. The following impacts are often imparted: The vegetation is damaged during the dumping event. In many cases in order to try and disguise these activities, offenders will venture deep into the vegetation and then dump their waste. This means that the ecotone's integrity is damaged and allows for the opening up of new areas previously not exposed to disturbance. Dumped material may often catch alight during burning events and due to the nature of the waste, which is highly flammable these areas become "dead spots", as the fire is so hot that it damages the soil and kills of the surrounding vegetation, which facilitates the establishment of alien vegetation.

# **10. BIODIVERSITY ASSESSMENT**

In terms of assessing the impacts of a proposed development on the receiving environment, it is imperative that the current state of the environment is assessed and the level at which it contributes currently is considered and recorded.

It is bearing this in mind that we have developed an assessment matrix which will assist in determining the current biodiversity and conservation value of the various landscape (vegetation types) that were encountered during the field survey. In addition we need to consider the biodiversity noteworthiness of the receiving environment (i.e. does the environment hold any rare species, protected species and unique landscape features) as well as the functional integrity and future sustainability of the vegetation types in the immediate footprint of the proposed development zone.

The final condition score of each near natural feature is calculated adding the Biodiversity noteworthiness score with the Functional integrity and Sustainability score. It must be noted that the two scores are weighted 50:50% respectively.

## 10.1. Biodiversity noteworthiness

In terms of the vegetation classifications that were identified from the aerial photography and ground truthed on site, the following assessment was made in terms of the noteworthiness of the vegetation that would be immediately impacted upon by the proposed development. The site was assessed as a whole and then by each HGM unit.

### 10.1.1. Cornubia North Site

Table 5. Biodiversity noteworthiness for the entire Cornubia North Site

Biodiversity Noteworthiness	Scores				
	0	1	2	3	4
Diversity		✓			
Rarity		✓			
Conservation Status	✓				
Red Data Species					✓
Uniqueness / Special features			✓		
<b>OVERALL VALUE</b>	<b>Total Score/number of categories is 8 / 5= 1.6</b>				

### 10.1.2. HGM Unit 1

Table 6. Biodiversity noteworthiness for HGM Unit 1

Biodiversity Noteworthiness	Scores				
	0	1	2	3	4
Diversity		✓			
Rarity	✓				
Conservation Status	✓				
Red Data	✓				
Uniqueness / Special features		✓			
<b>OVERALL VALUE</b>	<b>Total Score/number of categories is 2 / 5= 0.4</b>				

### 10.1.3. HGM Unit 2

Table 7. Biodiversity noteworthiness for HGM Unit 2

Biodiversity Noteworthiness	Scores				
	0	1	2	3	4
Diversity			✓		
Rarity		✓			
Conservation Status	✓				
Red Data					✓
Uniqueness / Special features			✓		
<b>OVERALL VALUE</b>	<b>Total Score/number of categories is 9 / 5= 1.8</b>				

10.1.4. HGM Unit-3

Table 8. Biodiversity noteworthiness for HGM Unit 3

Biodiversity Noteworthiness	Scores				
	0	1	2	3	4
Diversity			✓		
Rarity	✓				
Conservation Status	✓				
Red Data	✓				
Uniqueness / Special features		✓			
<b>OVERALL VALUE</b>	<b>Total Score/number of categories is 3 / 5= 0.6</b>				

10.1.5. Area 4 – Lower reaches of HGM Unit 1 & Xeric Riverine Thicket

Table 9. Biodiversity noteworthiness for HGM Unit 4

Biodiversity Noteworthiness	Scores				
	0	1	2	3	4
Diversity				✓	
Rarity				✓	
Conservation Status		✓			
Red Data					✓
Uniqueness / Special features					✓
<b>OVERALL VALUE</b>	<b>Total Score/number of categories is 15 / 5= 3.0</b>				

10.1.6. Area 5 – Scarp Forest with Xeric Riverine Thicket Elements

Table 10. Biodiversity noteworthiness for HGM Unit 5

Biodiversity Noteworthiness	Scores				
	0	1	2	3	4
Diversity					✓
Rarity					✓
Conservation Status		✓			
Red Data					✓
Uniqueness / Special features					✓
<b>OVERALL VALUE</b>	<b>Total Score/number of categories is 17 / 5= 3.4</b>				

10.1.7. Area 6 – Roadway leading to Farm Managers Dwelling and Dwelling Area

Table 11. Biodiversity noteworthiness for HGM Unit 6

Biodiversity Noteworthiness	Scores				
	0	1	2	3	4
Diversity		✓			
Rarity	✓				
Conservation Status	✓				
Red Data	✓				
Uniqueness / Special features	✓				
<b>OVERALL VALUE</b>	<b>Total Score/number of categories is 1 / 5= 0.2</b>				

10.1.8. Area 7 – Isolated Woody Fragment along Sugar Cane Road perpendicular to the M27

Table 12. Biodiversity noteworthiness for HGM Unit 7

Biodiversity Noteworthiness	Scores				
	0	1	2	3	4
Diversity				✓	
Rarity			✓		
Conservation Status	✓				
Red Data					✓
Uniqueness / Special features			✓		
<b>OVERALL VALUE</b>	Total Score/number of categories is 12 / 5= <b>2.4</b>				

10.1.9. Area 8 – HGM Unit 4

Table 13. Biodiversity noteworthiness for HGM Unit 8

Biodiversity Noteworthiness	Scores				
	0	1	2	3	4
Diversity	✓				
Rarity	✓				
Conservation Status	✓				
Red Data	✓				
Uniqueness / Special features		✓			
<b>OVERALL VALUE</b>	Total Score/number of categories is 1 / 5= <b>0.2</b>				

10.1.10. Area 9 – Ohlangua Floodplain

Table 14. Biodiversity noteworthiness for HGM Unit 9

Biodiversity Noteworthiness	Scores				
	0	1	2	3	4
Diversity	✓				
Rarity	✓				
Conservation Status	✓				
Red Data					✓
Uniqueness / Special features			✓		
<b>OVERALL VALUE</b>	Total Score/number of categories is 6 / 5= <b>1.2</b>				

## 10.2. Functional Integrity and Sustainability

The functional Integrity and sustainability speaks to the impact of the proposed activity on the receiving environment and the likelihood that it will be of significance and whether there are significant mitigation and or amelioration measures that are required to be put in place to ensure that the impacts are manageable and will not prove deleterious to the vegetation type as a whole, which falls within the current proposed area of disturbance.

### 10.2.1. Cornubia North Site

Table 15. Future Integrity and viability of the entire Cornubia North Site

Integrity & Future Viability	Scores				
	0	1	2	3	4
Buffer				✓	
Connectivity				✓	
Alteration	✓				
Invasive/pioneers	✓				
Size					✓
<b>OVERALL VALUE</b>	Total Score/number of categories is 10 / 5= <b>2.0</b>				

### 10.2.2. HGM Unit 1

Table 16. Future Integrity and viability of HGM Unit 1

Integrity & Future Viability	Scores				
	0	1	2	3	4
Buffer				✓	
Connectivity				✓	
Alteration		✓			
Invasive/pioneers	✓				
Size			✓		
<b>OVERALL VALUE</b>	Total Score/number of categories is 9 / 5= <b>1.8</b>				

### 10.2.3. HGM Unit 2

Table 17. Future Integrity and viability of HGM Unit 2

Integrity & Future Viability	Scores				
	0	1	2	3	4
Buffer	✓				
Connectivity			✓		
Alteration	✓				
Invasive/pioneers	✓				
Size			✓		
<b>OVERALL VALUE</b>	Total Score/number of categories is 4 / 5= <b>0.8</b>				

### 10.2.4. HGM Unit 3

Table 18. Future Integrity and viability of HGM Unit 3

Integrity & Future Viability	Scores				
	0	1	2	3	4
Buffer				✓	
Connectivity			✓		
Alteration	✓				
Invasive/pioneers	✓				
Size					✓
<b>OVERALL VALUE</b>	Total Score/number of categories is 9 / 5= <b>1.8</b>				



10.2.5. Area 4 – Lower reaches of HGM Unit 1 & Xeric Riverine Thicket

Table 19. Future Integrity and viability of HGM Unit 4

Integrity & Future Viability	Scores				
	0	1	2	3	4
Buffer				✓	
Connectivity				✓	
Alteration				✓	
Invasive/pioneers			✓		
Size		✓			
OVERALL VALUE	Total Score/number of categories is 12 / 5= <b>2.4</b>				

10.2.6. Area 5 – Scarp Forest with Xeric Riverine Thicket Elements

Table 20. Future Integrity and viability of HGM Unit 5

Integrity & Future Viability	Scores				
	0	1	2	3	4
Buffer					✓
Connectivity				✓	
Alteration				✓	
Invasive/pioneers			✓		
Size			✓		
OVERALL VALUE	Total Score/number of categories is 14 / 5= <b>2.8</b>				

10.2.7. Area 6 – Roadway leading to Farm Managers Dwelling and Dwelling Area

Table 21. Future Integrity and viability of HGM Unit 6

Integrity & Future Viability	Scores				
	0	1	2	3	4
Buffer		✓			
Connectivity	✓				
Alteration	✓				
Invasive/pioneers		✓			
Size				✓	
OVERALL VALUE	Total Score/number of categories is 5 / 5= <b>1.0</b>				

10.2.8. Area 7 – Isolated Woody Fragment along Sugar Cane Road perpendicular to the M27

Table 22. Future Integrity and viability of HGM Unit 7

Integrity & Future Viability	Scores				
	0	1	2	3	4
Buffer		✓			
Connectivity				✓	
Alteration		✓			
Invasive/pioneers			✓		
Size				✓	
OVERALL VALUE	Total Score/number of categories is 10 / 5= <b>2.0</b>				

10.2.9. Area 8 – HGM Unit 4

Table 23. Future Integrity and viability of HGM Unit 8

Integrity & Future Viability	Scores				
	0	1	2	3	4
Buffer	✓				
Connectivity				✓	
Alteration	✓				
Invasive/pioneers	✓				
Size		✓			
OVERALL VALUE	Total Score/number of categories is 4 / 5= <b>0.8</b>				

10.2.10. Area 9 – Ohlanga Floodplain

Table 24. Future Integrity and viability of HGM Unit 9

Integrity & Future Viability	Scores				
	0	1	2	3	4
Buffer				✓	
Connectivity				✓	
Alteration	✓				
Invasive/pioneers	✓				
Size					✓
OVERALL VALUE	Total Score/number of categories is 9 / 5= <b>1.8</b>				

The total combined score for the entire site and for each of the HGM Units is tabulated below:

Table 25. Future Integrity and viability of HGM Unit 9

	Biodiversity maintenance Score
<b>Greater Cornubia North Site</b>	<b>1.8</b>
<b>HGM1</b>	<b>0.6</b>
<b>HGM2</b>	<b>1.9</b>
<b>HGM3</b>	<b>0.8</b>
<b>Area 4 – Lower reaches of HGM Unit 1 &amp; Xeric Riverine Thicket</b>	<b>3.2</b>
<b>Area 5 –Scarp Forest with Xeric Riverine Thicket Elements</b>	<b>3.7</b>
<b>Area 6 – Roadway leading to Farm Managers Dwelling and Dwelling Area</b>	<b>0.3</b>
<b>Area 7 – Isolated Woody Fragment along Road</b>	<b>2.6</b>
<b>Area 8 – HGM Unit 4</b>	<b>0.3</b>
<b>Area 9 – Ohlanga Floodplain</b>	<b>1.4</b>

The overall site falls within the Moderately Low category in terms of biodiversity maintenance. HGM Units 1 and 3 and Areas 6 and 8 all fall within the **Low** category with regards to biodiversity maintenance, HGM Unit 2 falls within the **Moderately Low** category in terms of biodiversity maintenance, whilst HGM Unit 3 retain an **Intermediate** level for biodiversity maintenance. Areas 4 ranked **Moderately High** in terms of biodiversity maintenance. Whilst only Area 5 ranked as **High** category.

The interpretation therefore is such that the entire site should accept change relatively well. Further, construction of the development should not have any lasting significant impacts associated therewith, should adequate buffers be put in place, should rehabilitation be assumed and alien plant management undertaken.

## 11. DISCUSSIONS

There are numerous areas of woody vegetation and vegetation assemblages that are considered to be significant and of conservation noteworthiness, occurring on the site. These areas are ideally situated within the landscape as they occur on areas which are over-steep or fall within the delineated boundaries of wetlands, both of which are not suitable to accept development. Given the current environmental best practice being implemented by Tongaat Hulett Developments, the majority of wetland areas will not be subjected to development or destruction pressures. In particular, the important wetland systems and their associated vegetation will be utilised to facilitate rehabilitation and ensure that high quality Ecological Goods and Services (EG&S) will be provided by the Cornubia North Site. In addition, the important areas on the site are in relatively close proximity to one another and this provides the potential to link these systems together forming a landscape continuum<sup>7</sup> and an environmental and elevational gradient, which from a vegetation perspective and thus a habitat perspective will facilitate far greater diversity within the site. The greater the diversity the more robust and resilient an area becomes when exposed to disturbances.

Given that robustness and resilience of systems improves with diversity it is imperative that when developing the Cornubia North Open Plan System, due care is provided to understand the underlying ecological processes as well as how the vegetation and the individual species interact with the environment. It is therefore important that we consider the development of Ecological Networks (EN's) as opposed to simple corridors<sup>8</sup>. EN's incorporate all the positive aspects of corridors with additional benefits through the diversification and addition of varying spatial attributes and landscape features (nodes), which provide habitat (i.e. species become resident within these areas), resulting in a habitable heterogeneous network of linkages. The only recognized caveat and drawback to the development of EN's and the benefits that would be associated therewith are that their success is in the delivery of "habitat", which is a direct function of their width (**Samways, 2009**). Having identified this risk factor we are of the opinion that there is ample scope in the vicinity of the sensitive areas for the establishment of wide corridors that will incorporate a number of landscape elements, including, wetlands, forest patches and the associated terrestrial buffers which will be developed to assist in protecting the wetland systems and the forest areas.

Bearing in mind the proposed areas will be incorporated into an Open Space network, it is our opinion that with an alien management plan and a rehabilitation plan (aimed primarily at the wetland systems) that the vegetation on the site may be well preserved and that potential natural enhancement may occur as a result of the control and management of these areas. The preservation of these areas and the enhancement of the wetland systems will see a significant increase in the EG&S that will be delivered by this site even in the context of the land use change from agriculture to development.

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<sup>8</sup> **Corridors may be relatively simple to define, say, as movement corridors for a focal species (Hilty et al. 2006). However, when overall biodiversity is being conserved, inherent biological complexity of whole ecosystems becomes a major consideration. In short, no one corridor will necessarily benefit all ecological integrity, nor all natural ecosystem functions. The development of simplistic corridors, which do not consider the underlying ecological processes, may also have 'negative' effects, by providing pathways for predators or pathogens, thus reducing the value and integrity of these systems.**

## 12. RECOMMENDATIONS

The following recommendations refer to the vegetation components of proposed Cornubia North Development Site;

1. The retention of Area 4 & 5 is imperative as these areas house significant species diversity as well as rare, threatened and protected plant species;
2. Area 4 & 5 are also functioning at a relatively high level, with only pockets of alien vegetation that should be relatively easy to manage as they are currently not overly infested;
3. Area 4 & 5 should provide the species template should any areas require replanting;
4. Area 7 should be retained and form the basis for a relaxation of the woody species into the wetland areas, adjoining it;
5. HGM Unit 1 has significant vegetative value, particularly in the vicinity of the Ohlanga and where it is associated with Area 4;
6. HGM Unit 3 has limited natural vegetation, however, this area should be replanted with woody vegetation to restore the original *status quo*;
7. The removal of all alien invasive vegetation across the site, as well as the alien invasive plants, which are currently falling within the Ohlanga River floodplain;
8. The regular control and management of alien invasive species will be required. It is our recommendation that every 3 months for a year, and thereafter six monthly return visits until the alien vegetation on the site is deemed to be at a manageable level;
9. Following the initial and follow up alien plant control, a maintenance management plan that is dynamic and responds to the prevailing conditions, needs to be developed to continue to improve the quality of the Open Spaces that will form vital ecological linkages through the development.
10. Attempt to link Open Space areas with Ecological Networks of like vegetation or create an ecological continuum of habitat types utilising the Open Space Network that will be created around the wetland areas and sensitive vegetation areas that currently are occurring on the site;
11. Provincially and Nationally important plants may need to be relocated. This activity can only be undertaken post receipt of any permitting that may be required, and;
12. Relocation should occur during the summer months and with due care, preferably by a qualified botanist or similarly qualified individual;

## 13. CONCLUSIONS

The Greater Cornubia North Site approximately 763 hectares in extent and situated in the eThekweni Municipality is currently utilised for sugarcane production. There are a number of residential dwellings as well as some labour housing which occurs on the property. The remainder of the site comprises areas dominated by indigenous vegetation, areas which are a combination of alien invasive and indigenous vegetation and areas almost completely dominated by alien invasive vegetation. Further numerous Hydro-Geomorphic Units (HGM Units) occur on the site and these areas also retain some vegetation of significance whilst other portions are dominated by alien invasive species.

In terms of the woody vegetation on site; the habitat (niche) that these woody assemblages occupy are unique and are relatively poorly conserved throughout the eThekweni Municipality. In the opinion of the author these areas still contribute significantly to the biodiversity and conservation targets of the province and should be retained at all costs. Further these areas adjoin the Ohlanga Floodplain and are a natural extension of the Open Space System that has been created on the southern bank of the Ohlanga River on Cornubia. There are large and relatively well preserved areas which can add value to any conservation efforts and given their position on the site will form the central basin to which the majority of the site drains. These areas when considered individually to return a moderately high to high degree of biodiversity and conservation significance. The retention of rare and endemic species within these areas indicates their ability to withstand change and their overall robustness.

Therefore we would conclude that there are three (3) areas;

- Area 4 – Lower reaches of HGM Unit 1 & Xeric Riverine Thicket
- Area 5 – Scarp Forest with Xeric Riverine Thicket Elements
- Area 7 – Isolated Woody Fragment along Road ?

which are not associated with wetlands that must be conserved and their intrinsic value improved through the implementation of an alien invasive management plan. These areas must all be incorporated into the Open Space Network Plan that is to be developed for this site. The wetland units are also significant and where possible losses or transformations should be in areas of existing disturbance or where services are required to cross and no alternatives exist.

In conclusion there are areas of intrinsic biodiversity value that persist on the Cornubia North Site. A number of rare, threatened, endemic and protected plant species occur on the site. The following species were identified and are considered to have significant value. The species in question are; *Barringtonia racemosa*, *Crassula foveata*, *Haemanthus albiflos*, *Millettia grandis*, *Resnova humifusa*, *Scadoxus membranaceus*, *Scadoxus puniceus* and *Sideroxylon inerme* subsp. *inerme*.

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# **APPENDIX 1: SPECIES LISTS**



**COMPLETE SPECIES LIST**  
**CORNUBIA NORTH**



Species name	Common name	Status	Growth form	Category
<i>Abutilon sonneratianum</i>	Wild hibiscus	Indigenous	Herb	N/A
<i>Acacia caffra</i>	Common Hook Thorn	Indigenous	Tree	N/A
<i>Acacia natalitia</i>	Coastal Sweet Thorn	Indigenous	Tree	N/A
<i>Acacia nilotica</i>	Scented-pod Acacia	Indigenous	Tree	N/A
<i>Acacia robusta</i>	Robust Thorn	Indigenous	Tree	N/A
<i>Acacia schweinfurthii</i>	River climbing acacia	Indigenous	Climber	N/A
<i>Acacia xanthophloea</i>	Fever tree	Indigenous	Tree	N/A
<i>Acalypha glabrata</i>	Forest false nettle	Indigenous	Herb	N/A
<i>Achyranthes aspera</i>	Burweed	Alien	Herb	1
<i>Acokanthera oppositifolia</i>	Dune Poison Bush	Indigenous	Tree	N/A
<i>Adenopodia spicata</i>	Spiny splinter bean	Indigenous	Tree	N/A
<i>Agave sisalana</i>	Sisal	Alien	Succulent	2
<i>Ageratum conyzoides</i>	Billy goat-weed	Alien	Herb	1
<i>Albizia adianthifolia</i>	Flat crown	Indigenous	Tree	N/A
<i>Albizia lebbeck</i>	Lebbeck tree	Alien	Tree	1
<i>Allophylus africanus</i>	Witbos	Indigenous	Tree	N/A
<i>Aloe pluridens</i>	French aloe	Indigenous	Succulent	N/A
<i>Ambrosia artemisiifolia</i>	Common Ragweed	Alien	Herb	N/A
<i>Aneilema aequinoctiale</i>	Clinging Aneilema	Indigenous	Herb	N/A
<i>Anredera cordifolia</i>	Madeira vine	Alien	Creeper	1
<i>Apodytes dimidiata</i>	White pear	Indigenous	Tree	N/A
<i>Arundo donax</i>	Spanish reed	Alien	Grass	1
<i>Asparagus larycinus</i>	Cluster leaf asparagus	Indigenous	Herb	N/A
<i>Asparagus virgatus</i>		Indigenous	Herb	N/A
<i>Asystasia gangetica</i>	Creeping Foxglove	Alien	Herb	N/A
<i>Bambusoideae</i>	Bamboo	Alien	Tree	N/A
<i>Barleria gueinzii</i>		Indigenous	Herb	N/A
<b><i>Barringtonia racemosa</i></b>	<b>Powder-puff tree</b>	<b>Protected</b>	<b>Tree</b>	<b>N/A</b>
<i>Berkheya bipinnatifida</i>		Indigenous	Herb	N/A
<i>Blumea alata</i>		Indigenous	Herb	N/A
<i>Brachylaena discolor</i>	Silver oak	Indigenous	Tree	N/A
<i>Brachylaena uniflora</i>	Tall Silver Oak	Indigenous	Tree	N/A
<i>Bridelia micrantha</i>	Mitzeerie	Indigenous	Tree	N/A
<i>Burchellia bubalina</i>	Wild Pomegranate	Indigenous	Tree	N/A
<i>Cadaba natalensis</i>	Natal Worm Bush	Indigenous	Shrub	N/A
<i>Calpurnia aurea</i> subsp. <i>aurea</i>	Showy Calpurnia	Indigenous	Tree	N/A
<i>Canna indica</i>	Canna	Alien	Herb	1
<i>Canthium ciliatum</i>	Hairy Turkey Berry	Indigenous	Tree	N/A
<i>Canthium inerme</i>	Turkey berry	Indigenous	Tree	N/A
<i>Capparis brassii</i>		Indigenous	Climber	N/A
<i>Cardiospermum grandiflorum</i>	Balloon vine	Alien	Herb	1
<i>Carissa bispinosa</i>	Num-num	Indigenous	Tree	N/A
<i>Celtis africana</i>	White stinkwood	Indigenous	Tree	N/A

Species name	Common name	Status	Growth form	Category
<i>Centella asiatica</i>	Penny wort	Alien	Herb	N/A
<i>Cestrum laevigatum</i>	Ink berry	Alien	Herb	1
<i>Chaetachme aristata</i>	Thorny elm	Indigenous	Herb	N/A
<i>Chromolaena odorata</i>	Triffid weed	Alien	Herb	1
<i>Chrysopogon zizanioides</i>	Vetiver Grass	Alien	Grass	N/A
<i>Clausena anisata</i>	Horsewood	Indigenous	Shrub	N/A
<i>Clerodendrum glabrum</i>	Tinder wood	Indigenous	Tree	N/A
<i>Coddia rudis</i>	Small bone apple	Indigenous	Tree	N/A
<i>Colocasia esculenta</i>	Madumbi	Alien	Herb	N/A
<i>Combretum erythrophyllum</i>	River bush willow	Indigenous	Tree	N/A
<i>Commelina benghalensis</i>	Bengal wandering Jew	Alien	Herb	N/A
<i>Commelina eckloniana</i>	Ecklon's Blue Commelina	Indigenous	Herb	N/A
<i>Commelina erecta</i>	Slender day flower	Indigenous	Herb	N/A
<i>Commiphora woodii</i>	Forest corkwood	Indigenous	Tree	N/A
<i>Cordia caffra</i>	Septee saucer-berry	Indigenous	Tree	N/A
<i>Crassula foveata</i> <sup>1</sup>		Indigenous	Succulent	N/A
<i>Crotalaria juncea</i>	Sunn hemp	Alien	Herb	N/A
<i>Crotalaria lanceolata</i>	Lanceleaf rattlebox	Indigenous	Herb	N/A
<i>Crotalaria natalensis</i>		Indigenous	Herb	N/A
<i>Croton sylvaticus</i>	Forest Fever-berry	Indigenous	Tree	N/A
<i>Cryptocarya woodii</i>	Cape Quince	Indigenous	Tree	N/A
<i>Cucumis sp.</i>	Wild cucumber	Indigenous	Herb	N/A
<i>Cussonia sphaerocephala</i>	Cabbage tree	Indigenous	Tree	N/A
<i>Cussonia zuluensis</i>	Natal cabbage tree	Indigenous	Tree	N/A
<i>Cycas sp.</i>		Alien	Tree	N/A
<i>Cyperus dives</i>	Yellow nutsedge	Alien	Sedge	N/A
<i>Cyperus natalensis</i>		Indigenous	Sedge	N/A
<i>Cyperus rotundus</i>	Purple Nut Sedge	Indigenous	Sedge	N/A
<i>Cyperus textilis</i>	Mat Sedge	Indigenous	Sedge	N/A
<i>Dalbergia armata</i>	Hluhluwe climber	Indigenous	Climber	N/A
<i>Dalbergia nitidula</i>	Glossy Flat bean	Indigenous	Climber	N/A
<i>Dalbergia obovata</i>	Climbing flat bean	Indigenous	Climber	N/A
<i>Delonix regia</i>	Flamboyant	Alien	Tree	N/A
<i>Desmodium incanum</i>	Creeping Beggar weed	Alien	Herb	N/A
<i>Dichrostachys cinerea</i>	Sickle bush	Indigenous	Tree	N/A
<i>Dicliptera heterostegia</i>		Indigenous	Herb	N/A
<i>Dietes iridoides</i>	Wood Iris	Indigenous	Herb	N/A
<i>Dioscorea cotinifolia</i>	Wild yam	Indigenous	Herb	N/A
<i>Diospyros lycioides</i>	Blue bush	Indigenous	Tree	N/A
<i>Diospyros villosa</i>	Hairy star apple	Indigenous	Tree	N/A
<i>Distephanus anisochaetoides</i>		Indigenous	Herb	N/A

<sup>1</sup> RARE

Species name	Common name	Status	Growth form	Category
<i>Dombeya cymosa</i>	Smooth Wild Pear	Indigenous	Tree	N/A
<i>Dombeya rotundifolia</i>	Wild pear	Indigenous	Tree	N/A
<i>Dovyalis rhamnoides</i>	Sourberry Kei-Apple	Indigenous	Tree	N/A
<i>Dracaena fragrans</i>	Janet Craig Dracaena	Indigenous	Tree	731
<i>Ekebergia capensis</i>	Cape ash	Indigenous	Tree	N/A
<i>Erythrina lysistemon</i>	Coral tree	Indigenous	Tree	N/A
<i>Eucalyptus grandis</i>	Rose gum	Alien	Tree	2
<i>Euclea crispa</i>	Blue guarri	Indigenous	Tree	N/A
<i>Euclea daphnoides</i>	White stem guarri	Indigenous	Tree	N/A
<i>Euphorbia evansii</i>	Low Veld Euphorbia	Indigenous	Tree	N/A
<i>Euphorbia pulcherrima</i>	Poinsettia	Alien	Shrub	N/A
<i>Euphorbia triangularis</i>	River euphorbia	Indigenous	Succulent Tree	N/A
<i>Ficus burkei</i>	Common wild fig	Indigenous	Tree	N/A
<i>Ficus lutea</i>	Giant leaved fig	Indigenous	Tree	N/A
<i>Ficus natalensis</i>	Natal Fig	Indigenous	Tree	N/A
<i>Ficus sur</i>	Cape fig	Indigenous	Tree	N/A
<i>Flagellaria guineensis</i>	Climbing bamboo	Indigenous	Herb	N/A
<i>Grewia occidentalis</i>	Cross berry	Indigenous	Tree	N/A
<i>Gymnosporia arenicola</i>	Coast spike-thorn	Indigenous	Tree	N/A
<i>Gymnosporia buxifolia</i>	Common spike-thorn	Indigenous	Tree	N/A
<b><i>Haemanthus albiflos</i></b>	<b>White Paint Brush</b>	<b>Protected</b>	<b>Herb</b>	<b>N/A</b>
<i>Halleria lucida</i>	Tree Fuchsia	Indigenous	Tree	N/A
<i>Harpephyllum caffrum</i>	Wild plum	Indigenous	Tree	N/A
<i>Hedychium coronarium</i>	White Ginger lily	Alien	Shrub	1
<i>Hewittia malabarica</i>		Indigenous	Herb	N/A
<i>Hibiscus calyphyllus</i>	Large Yellow Wild Hibiscus	Indigenous	Shrub	N/A
<i>Hibiscus cannabinus</i>	Indian Hemp leaf	Alien	Creeper	N/A
<i>Hippobromus pauciflorus</i>	False horse wood	Indigenous	Shrub	N/A
<i>Hypoestes aristata</i>	Purple Haze	Indigenous	Herb	N/A
<i>Ipomoea cairica</i>	Morning glory	Alien	Herb	N/A
<i>Ipomoea purpurea</i>	Common morning glory	Alien	Creeper	3
<i>Ischaemum afrum</i>	Common morning glory	Alien	Creeper	3
<i>Ischaemum fasciculatum</i>	Common morning glory	Alien	Creeper	3
<i>Isoglossa</i> sp.		Indigenous	Herb	N/A
<i>Jasminum</i> sp.	Jasmine	Indigenous	climber	N/A
<i>Justicia campylostemon</i>		Indigenous	Herb	N/A
<i>Justicia petiolaris</i>		Indigenous	Herb	N/A
<i>Justicia protracta</i>		Indigenous	Herb	N/A
<i>Kalanchoe rotundifolia</i>	Common Kalanchoe	Indigenous	Succulent Herb	N/A
<i>Kraussia floribunda</i>	Rhino coffee	Indigenous	Tree	N/A
<i>Lagynias lasiantha</i>	Smooth Pendant Medlar	Indigenous	Tree	N/A

Species name	Common name	Status	Growth form	Category
<i>Lantana camara</i>	Tick berry	Alien	Shrub	1
<i>Leucaena leucocephala</i>	Leucaena	Alien	Shrub	2
<i>Litsea glutinosa</i>	India laurel	Alien	Tree	1
<i>Malvastrum coromandelianum</i>	3 lobed false mallow	Alien	Herb	N/A
<i>Marsdenia floribunda</i>	Madagascar Jasmin	Alien	Herb	N/A
<i>Maytenus peduncularis</i>	Blackwood	Indigenous	Tree	N/A
<i>Melanthera scandens</i> subsp. <i>madagascariensis</i>		Indigenous	Herb	N/A
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<i>Melinis repens</i>	Natal red top	Indigenous	Grass	N/A
<b><i>Millettia grandis</i></b>	<b>Umzimbeet</b>	<b>Protected</b>	<b>Tree</b>	<b>N/A</b>
<i>Mirabilis jalapa</i>	Marvel of Peru	Alien	Herb	N/A
<i>Montanoa hibiscifolia</i>	Mexican tree daisy	Alien	Shrub	1
<i>Morus alba</i>	Mulberry Tree	Alien	Tree	3
<i>Musa acuminata</i> cultivar	Domestic banana	Alien	Tree	N/A
<i>Nidorella auriculata</i>		Indigenous	Herb	N/A
<i>Obetia tenax</i>	Mountain Nettle	Indigenous	Shrub	N/A
<i>Ochna natalitia</i>	Natal Plane	Indigenous	Tree	N/A
<i>Opuntia ficus-indica</i>	Prickly pear	Alien	Succulent tree	1
<i>Oxalis semiloba</i>	Common sorrel	Indigenous	Herb	N/A
<i>Pachystigma bowkeri</i>	Forest Crown Medlar	Indigenous	Tree	N/A
<i>Panicum maximum</i>	Guinea grass	Indigenous	Grass	N/A
<i>Paspalum scrobiculatum</i>	Kodo Millet	Alien	Grass	N/A
<i>Paspalum urvillei</i>	Vasey grass	Alien	Grass	N/A
<i>Passiflora foetida</i>		Alien	Climber	N/A
<i>Passiflora suberosa</i>	Devils pumpkin	Alien	Herb	1
<i>Passiflora subpeltata</i>	Wild granadilla	Alien	Climber	1
<i>Pavetta lanceolata</i>	Weeping Brides bush	Indigenous	Tree	N/A
<i>Pavonia columella</i>		Indigenous	Herb	N/A
<i>Petropentia natalensis</i>	Propeller Vine	Indigenous	Liana	N/A
<i>Phaulopsis imbricata</i>	Himalayan Ruellia	Indigenous	Herb	N/A
<i>Phoenix reclinata</i>	Date Palm	Indigenous	Palm	N/A
<i>Phragmites australis</i>	Common reed	Alien	Grass	N/A
<i>Plectranthus saccatus</i>	Stoep Jacaranda	Indigenous	Herb	N/A
<i>Protorhus longifolia</i>	Red Beech	Indigenous	Tree	N/A
<i>Psidium cattleianum</i>	Strawberry guava	Alien	Tree	3
<i>Psidium guajava</i>	Guava tree	Alien	Tree	2
<i>Psychotria capensis</i>	Black bird-berry	Indigenous	Tree	N/A
<i>Psydrax locuples</i>	Sand Quar	Indigenous	Tree	N/A
<i>Pupalia lappacea</i>	Forest Bur	Indigenous	Herb	N/A
<i>Putterlickia verrucosa</i>	Mock forest spike thorn	Indigenous	Tree	N/A
<i>Pycreus polystachyos</i>		Indigenous	Sedge	N/A
<b><i>Resnova humifusa</i></b>		<b>Protected</b>	<b>Herb</b>	<b>N/A</b>

Species name	Common name	Status	Growth form	Category
<i>Rhinacanthus gracilis</i>		Indigenous	Herb	N/A
<i>Rhoicissus digitata</i>	Baboon grape	Indigenous	Climber	N/A
<i>Rhoicissus tomentosa</i>	Wild grape	Indigenous	Climber	N/A
<i>Rhoicissus tridentata</i>	Bushman's grape	Indigenous	Climber	N/A
<i>Rhynchosia caribaea</i>	Monya-mali	Indigenous	Herb	N/A
<i>Ricinus communis</i>	Castor oil plant	Alien	Herb	2
<i>Rivina humilis</i>	Blood berry	Alien	Herb	1
<i>Rothmannia globosa</i>	September Bells	Indigenous	Tree	N/A
<i>Rubus cuneifolius</i>	American bramble	Alien	Shrub	1
<i>Ruttya ovata</i>	Ruttya	Indigenous	Tree	N/A
<i>Saccharum sp.</i>	Sugar cane	Alien	Grass	N/A
<i>Sansevieria hyacinthoides</i>	Mother-in-laws tongue	Indigenous	Herb	N/A
<i>Sarcostemma viminalis</i>	Rapunzel plant	Indigenous	Climber	N/A
<b><i>Scadoxus membranaceus</i></b>	<b>Dwarf Paintbrush lily</b>	<b>Protected</b>	<b>Herb</b>	<b>N/A</b>
<b><i>Scadoxus puniceus</i></b>	<b>Paintbrush lily</b>	<b>Protected</b>	<b>Herb</b>	<b>N/A</b>
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	Alien	Tree	1
<i>Schotia brachypetala</i>	African Walnut	Indigenous	Tree	N/A
<i>Scolopia zeyheri</i>	Red pear	Indigenous	Tree	N/A
<i>Searsia chirindensis</i>	Red currant	Indigenous	Tree	N/A
<i>Searsia nebulosa</i>	Sand Currant	Indigenous	Tree	N/A
<i>Searsia pyroides</i> var. <i>gracilis</i>		Indigenous	Tree	N/A
<i>Searsia rigida</i>		Indigenous	Tree	N/A
<i>Secamone gerrardii</i>	Gerrard's Secamone	Indigenous	Climbers	N/A
<i>Senecio chrysocoma</i>		Indigenous	Herb	N/A
<i>Senecio helminthioides</i>		Indigenous	Herb	N/A
<i>Senecio madagascarensis</i>		Indigenous	Herb	N/A
<i>Senecio tamoides</i>	Canary creeper	Indigenous	Creeper	N/A
<i>Senna bicapsularis</i>	Rambling cassia	Alien	Herb	3
<i>Senna didymobotrya</i>	Peanut butter senna	Alien	Shrub	3
<i>Senna hirsuta</i>	Woolly senna	Alien	Herb	N/A
<i>Sesbania bispinosa</i>	Spiny Sesbania	Alien	Shrub	N/A
<i>Sesbania punicea</i>	Red Sesbania	Alien	Shrub	1
<i>Setaria megaphylla</i>	Broad-leafed bristle grass	Indigenous	Grass	N/A
<i>Setaria sagittifolia</i>	Broad-leafed bristle grass	Indigenous	Grass	N/A
<i>Sida cordifolia</i>	Spider leg	Indigenous	Herb	N/A
<i>Sida dregei</i>	Spider leg	Indigenous	Herb	N/A
<b><i>Sideroxylon inerme</i></b>	<b>White milk wood</b>	<b>Protected</b>	<b>Tree</b>	<b>N/A</b>
<i>Solanum mauritianum</i>	Bugweed	Alien	Tree	1
<i>Sorghum halepense</i>	Johnson grass	Alien	Grass	2
<i>Spathodea campanulata</i>	African tulip tree	Alien	Tree	N/A
<i>Sphagneticola triloba</i>	Singapore Daisy	Alien	Herb	N/A
<b><i>Stellarioides longibracteata</i></b>	<b>Sea Onion</b>	<b>Protected</b>	<b>Bulb</b>	<b>N/A</b>
<i>Stenotaphrum secundatum</i>	Buffalo grass	Indigenous	Grass	N/A

Species name	Common name	Status	Growth form	Category
<i>Strelitzia nicolai</i>	Wild banana	Indigenous	Tree	N/A
<i>Striga asiatica</i>	Witch weed	Indigenous	Herb	N/A
<i>Strychnos usambarensis</i>	Stipe-fruited Strychnos	Indigenous	Herb	N/A
<i>Syzygium cordatum</i>	Umdoni	Indigenous	Tree	N/A
<i>Syzygium cumini</i>	Jambolan	Alien	Tree	3
<i>Tagetes minuta</i>	Southern cone marigold	Alien	Herb	N/A
<i>Tarena pavetoides</i>	Large-leaved Tarena	Indigenous	Tree	N/A
<i>Tephrosia polystachya</i>	Pioneer Tephrosia	Indigenous	Herb	N/A
<i>Tithonia diversifolia</i>	Mexican sunflower	Alien	Herb	1
<i>Trema orientalis</i>	Pigeon wood	Indigenous	Tree	N/A
<i>Tricalysia lanceolata</i>	Coast Jackal Coffee	Indigenous	Tree	N/A
<i>Trichilia emetica</i>	Natal mahogany	Indigenous	Tree	N/A
<i>Trimeria grandifolia</i>	Wild mulberry	indigenous	Tree	N/A
<i>Turraea floribunda</i>	Honey suckle tree	Indigenous	Tree	N/A
<i>Turraea obtusifolia</i>	Small Honey Suckle Tree	Indigenous	Tree	N/A
<i>Typha capensis</i>	Bulrush	Indigenous	Sedge	N/A
<i>Uvaria caffra</i>	Small Fruit Cluster Pear	Indigenous	Climber	N/A
<i>Vigna vexillata</i>	Zombie Pea	Indigenous	Herb	N/A
<i>Vitellariopsis marginata</i>	Forest Bush-Milkwood	Indigenous	Tree	N/A
<i>Zanthoxylum capense</i>	Small knob wood	Indigenous	Tree	N/A
<i>Ziziphus mucronata</i>	Blinkblaar-wag-n-bietjie	Indigenous	Tree	N/A



**SPECIES LISTS FOR  
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## HGM 1

Species name	Common name	Status	Growth form	Category
<i>Achyranthes aspera</i>	Burweed	Alien	Herb	1
<i>Ageratum conyzoides</i>	Billy goat-weed	Alien	Herb	1
<i>Albizia lebbbeck</i>	Lebbeck tree	Alien	Tree	1
<i>Albizia lebbbeck</i>	Lebbeck tree	Alien	Tree	1
<i>Albizia lebbbeck</i>	Lebbeck tree	Alien	Tree	1
<i>Arundo donax</i>	Spanish reed	Alien	Grass	1
<i>Bridelia micrantha</i>	Mitzeerie	Indigenous	Tree	N/A
<i>Canna indica</i>	Canna	Alien	Herb	1
<i>Centella asiatica</i>	Penny wort	Alien	Herb	N/A
<i>Cestrum laevigatum</i>	Ink berry	Alien	Herb	1
<i>Chromolaena odorata</i>	Triffid weed	Alien	Herb	1
<i>Clerodendrum glabrum</i>	Tinder wood	Indigenous	Tree	N/A
<i>Clerodendrum glabrum</i>	Tinder wood	Indigenous	Tree	N/A
<i>Clerodendrum glabrum</i>	Tinder wood	Indigenous	Tree	N/A
<i>Commelina erecta</i>	Slender day flower	Indigenous	Herb	N/A
<i>Commiphora woodii</i>	Forest corkwood	Indigenous	Tree	N/A
<i>Crotalaria juncea</i>	Sunn hemp	Alien	Herb	N/A
<i>Crotalaria lanceolata</i>	Lanceleaf rattlebox	Indigenous	Herb	N/A
<i>Cyperus dives</i>	Yellow nutsedge	Alien	Sedge	N/A
<i>Cyperus dives</i>	Yellow nutsedge	Alien	Sedge	N/A
<i>Cyperus textilis</i>	Mat Sedge	Indigenous	Sedge	N/A
<i>Desmodium incanum</i>	Creeping Beggar weed	Alien	Herb	N/A
<i>Erythrina lysistemon</i>	Coral tree	Indigenous	Tree	N/A
<i>Erythrina lysistemon</i>	Coral tree	Indigenous	Tree	N/A
<i>Euphorbia pulcherrima</i>	Poinsettia	Alien	Shrub	N/A
<i>Ficus burkei</i>	Common wild fig	Indigenous	Tree	N/A
<i>Ficus lutea</i>	Giant leaved fig	Indigenous	Tree	N/A



Species name	Common name	Status	Growth form	Category
<i>Ficus sur</i>	Cape fig	Indigenous	Tree	N/A
<i>Ficus sur</i>	Cape fig	Indigenous	Tree	N/A
<i>Ficus sur</i>	Cape fig	Indigenous	Tree	N/A
<i>Halleria lucida</i>	Tree Fuchsia	Indigenous	Tree	N/A
<i>Ipomoea purpurea</i>	Common morning glory	Alien	Creeper	3
<i>Lantana camara</i>	Tick berry	Alien	Shrub	1
<i>Lantana camara</i>	Tick berry	Alien	Shrub	1
<i>Litsea glutinosa</i>	India laurel	Alien	Tree	1
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<i>Paspalum scrobiculatum</i>	Kodo Millet	Alien	Grass	N/A
<i>Paspalum urvillei</i>	Vasey grass	Alien	Grass	N/A
<i>Phoenix reclinata</i>	Date Palm	Indigenous	Palm	N/A
<i>Phoenix reclinata</i>	Date Palm	Indigenous	Palm	N/A
<i>Phragmites australis</i>	Common reed	Alien	Grass	N/A
<i>Psidium guajava</i>	Guava tree	Alien	Tree	2
<i>Psidium guajava</i>	Guava tree	Alien	Tree	2
<i>Pycreus polystachyos</i>		Indigenous	Sedge	N/A
<i>Rivina humilis</i>	Blood berry	Alien	Herb	1
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	Alien	Tree	1
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	Alien	Tree	1
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	Alien	Tree	1
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	Alien	Tree	1
<i>Sesbania punicea</i>	Red Sesbania	Alien	Shrub	1
<i>Setaria megaphylla</i>	Broad-leafed bristle grass	Indigenous	Grass	N/A
<i>Sida cordifolia</i>	Spider leg	Indigenous	Herb	N/A
<i>Solanum mauritianum</i>	Bugweed	Alien	Tree	1

Species name	Common name	Status	Growth form	Category
<i>Solanum mauritianum</i>	Bugweed	Alien	Tree	1
<i>Solanum mauritianum</i>	Bugweed	Alien	Tree	1
<i>Stenotaphrum secundatum</i>	Buffalo grass	Indigenous	Grass	N/A
<i>Strelitzia nicolai</i>	Wild banana	Indigenous	Tree	N/A
<i>Syzygium cordatum</i>	Umdoni	Indigenous	Tree	N/A
<i>Syzygium cordatum</i>	Umdoni	Indigenous	Tree	N/A
<i>Tagetes minuta</i>	Southern cone marigold	Alien	Herb	N/A
<i>Trema orientalis</i>	Pigeon wood	Indigenous	Tree	N/A
<i>Typha capensis</i>	Bulrush	Indigenous	Sedge	N/A

#### HGM 2

Species name	Common name	Status	Growth form	Category
<i>Acacia robusta</i>	Robust Thorn	Indigenous	Tree	N/A
<i>Acacia schweinfurthii</i>	River climbing acacia	Indigenous	Climber	N/A
<i>Acalypha glabrata</i>	Forest false nettle	Indigenous	Herb	N/A
<i>Achyranthes aspera</i>	Burweed	Alien	Herb	1
<i>Ageratum conyzoides</i>	Billy goat-weed	Alien	Herb	1
<i>Apodytes dimidiata</i>	White pear	Indigenous	Tree	N/A
<i>Arundo donax</i>	Spanish reed	Alien	Grass	1
<i>Arundo donax</i>	Spanish reed	Alien	Grass	1
<i>Asparagus virgatus</i>		Indigenous	Herb	N/A
<i>Bambusoideae</i>	Bamboo	Alien	Tree	N/A
<b><i>Barringtonia racemosa</i></b>	<b>Powder-puff tree</b>	<b>Protected</b>	<b>Tree</b>	<b>N/A</b>
<i>Blumea alata</i>		Indigenous	Herb	N/A
<i>Canna indica</i>	Canna	Alien	Herb	1
<i>Canna indica</i>	Canna	Alien	Herb	1
<i>Canna indica</i>	Canna	Alien	Herb	1
<i>Cardiospermum grandiflorum</i>	Balloon vine	Alien	Herb	1

Species name	Common name	Status	Growth form	Category
<i>Celtis africana</i>	White stinkwood	Indigenous	Tree	N/A
<i>Cestrum laevigatum</i>	Ink berry	Alien	Herb	1
<i>Chromolaena odorata</i>	Triffid weed	Alien	Herb	1
<i>Chromolaena odorata</i>	Triffid weed	Alien	Herb	1
<i>Chromolaena odorata</i>	Triffid weed	Alien	Herb	1
<i>Clerodendrum glabrum</i>	Tinder wood	Indigenous	Tree	N/A
<i>Clerodendrum glabrum</i>	Tinder wood	Indigenous	Tree	N/A
<i>Commelina eckloniana</i>	Ecklon's Blue Commelina	Indigenous	Herb	N/A
<i>Cucumis sp.</i>	Wild cucumber	Indigenous	Herb	N/A
<i>Cyperus dives</i>		Indigenous	Sedge	N/A
<i>Cyperus natalensis</i>		Indigenous	Sedge	N/A
<i>Dalbergia obovata</i>	Climbing flat bean	Indigenous	Climber	N/A
<i>Desmodium incanum</i>	Creeping Beggarweed	Alien	Herb	N/A
<i>Distephanus anisochaetoides</i>		Indigenous	Herb	N/A
<i>Eucalyptus grandis</i>	Rose gum	Alien	Tree	2
<i>Eucalyptus grandis</i>	Rose gum	Alien	Tree	2
<i>Ficus burkei</i>	Common wild fig	Indigenous	Tree	N/A
<i>Ficus burkei</i>	Common wild fig	Indigenous	Tree	N/A
<i>Ficus burkei</i>	Common wild fig	Indigenous	Tree	N/A
<i>Ficus lutea</i>	Giant leaved fig	Indigenous	Tree	N/A
<i>Ipomoea cairica</i>	Morning glory	Alien	Herb	N/A
<i>Ipomoea cairica</i>	Morning glory	Alien	Herb	N/A
<i>Ipomoea purpurea</i>	Common morning glory	Alien	Creeper	3
<i>Ipomoea purpurea</i>	Common morning glory	Alien	Creeper	3
<i>Justicia protracta</i>		Indigenous	Herb	N/A
<i>Lantana camara</i>	Tick berry	Alien	Shrub	1
<i>Litsea glutinosa</i>	India laurel	Alien	Tree	1
<i>Melia azedarach</i>	Syringa	Alien	Tree	3

Species name	Common name	Status	Growth form	Category
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<i>Melinis repens</i>	Natal red top	Indigenous	Grass	N/A
<b><i>Millettia grandis</i></b>	<b>Umzimbeet</b>	<b>Protected</b>	<b>Tree</b>	<b>N/A</b>
<i>Nidorella auriculata</i>		Indigenous	Herb	N/A
<i>Panicum maximum</i>	Guinea grass	Indigenous	Grass	N/A
<i>Passiflora foetida</i>		Alien	Climber	N/A
<i>Passiflora subpeltata</i>	Wild granadilla	Alien	Climber	1
<i>Pavetta lanceolata</i>	Weeping Brides bush	Indigenous	Tree	N/A
<i>Phragmites australis</i>	Common reed	Alien	Grass	N/A
<i>Psidium cattleianum</i>	Strawberry guava	Alien	Tree	3
<i>Psidium guajava</i>	Guava tree	Alien	Tree	2
<i>Psidium guajava</i>	Guava tree	Alien	Tree	2
<i>Rhynchosia caribaea</i>	Monya-mali	Indigenous	Herb	N/A
<i>Ricinus communis</i>	Castor oil plant	Alien	Herb	2
<i>Ricinus communis</i>	Castor oil plant	Alien	Herb	2
<i>Ricinus communis</i>	Castor oil plant	Alien	Herb	2
<i>Rivina humilis</i>	Blood berry	Alien	Herb	1
<i>Rivina humilis</i>	Blood berry	Alien	Herb	1
<i>Rivina humilis</i>	Blood berry	Alien	Herb	1
<i>Rubus cuneifolius</i>	American bramble	Alien	Shrub	1
<i>Saccharum sp.</i>	Sugar cane	Alien	Grass	N/A
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	Alien	Tree	1
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	Alien	Tree	1
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	Alien	Tree	1
<i>Senecio madagascarensis</i>		Indigenous	Herb	N/A
<i>Senna bicapsularis</i>	Rambling cassia	Alien	Herb	3

Species name	Common name	Status	Growth form	Category
<i>Sesbania bispinosa</i>	Spiny Sesbania	Alien	Shrub	N/A
<i>Sida cordifolia</i>	Spider leg	Indigenous	Herb	N/A
<b><i>Sideroxylon inerme</i></b>	<b>White milk wood</b>	<b>Protected</b>	<b>Tree</b>	<b>N/A</b>
<i>Solanum mauritianum</i>	Bugweed	Alien	Tree	1
<i>Solanum mauritianum</i>	Bugweed	Alien	Tree	1
<i>Stenotaphrum secundatum</i>	Buffalo grass	Indigenous	Grass	N/A
<i>Syzygium cumini</i>	Jambolan	Alien	Tree	3
<i>Trema orientalis</i>	Pigeon wood	Indigenous	Tree	N/A
<i>Trichilia emetica</i>	Natal mahogany	Indigenous	Tree	N/A
<i>Trimeria grandifolia</i>	Wild mulberry	indigenous	Tree	N/A
<i>Turraea floribunda</i>	Honey suckle tree	Indigenous	Tree	N/A

### HGM 3

Species name	Common name	Status	Growth form	Category
<i>Agave sisalana</i>	Sisal	Alien	Succulent	2
<i>Ageratum conyzoides</i>	Billy goat-weed	Alien	Herb	1
<i>Apodytes dimidiata</i>	White pear	Indigenous	Tree	N/A
<i>Arundo donax</i>	Spanish reed	Alien	Grass	1
<i>Barleria gueinzii</i>		Indigenous	Herb	N/A
<i>Berkheya bipinnatifida</i>		Indigenous	Herb	N/A
<i>Berkheya bipinnatifida</i>		Indigenous	Herb	N/A
<i>Bridelia micrantha</i>	Mitzeerie	Indigenous	Tree	N/A
<i>Bridelia micrantha</i>	Mitzeerie	Indigenous	Tree	N/A
<i>Bridelia micrantha</i>	Mitzeerie	Indigenous	Tree	N/A
<i>Canna indica</i>	Canna	Alien	Herb	1
<i>Chromolaena odorata</i>	Triffid weed	Alien	Herb	1
<i>Chromolaena odorata</i>	Triffid weed	Alien	Herb	1
<i>Crotalaria lanceolata</i>	Lance leaf rattlebox	Indigenous	Herb	N/A

Species name	Common name	Status	Growth form	Category
<i>Cyperus dives</i>	Yellow nutsedge	Alien	Sedge	N/A
<i>Dalbergia armata</i>	Hluhluwe climber	Indigenous	Climber	N/A
<i>Desmodium incanum</i>	Creeping Beggarweed	Alien	Herb	N/A
<i>Dichrostachys cinerea</i>	Sickle bush	Indigenous	Tree	N/A
<i>Dicliptera heterostegia</i>		Indigenous	Herb	N/A
<i>Dracaena fragrans</i>	Janet Craig dracaena	Indigenous	Tree	731
<i>Euclea crispa</i>	Blue guarri	Indigenous	Tree	N/A
<i>Ficus sur</i>	Cape fig	Indigenous	Tree	N/A
<i>Hewittia malabarica</i>		Indigenous	Herb	N/A
<i>Hibiscus cannabinus</i>	Indian Hemp leaf	Alien	Creeper	N/A
<i>Hippobromus pauciflorus</i>	False horse wood	Indigenous	Shrub	N/A
<i>Ipomoea cairica</i>	Morning glory	Alien	Herb	N/A
<i>Ipomoea purpurea</i>	Common morning glory	Alien	Creeper	3
<i>Lantana camara</i>	Tick berry	Alien	Shrub	1
<i>Leucaena leucocephala</i>	Leucaena	Alien	Shrub	2
<i>Litsea glutinosa</i>	India laurel	Alien	Tree	1
<i>Litsea glutinosa</i>	India laurel	Alien	Tree	1
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<i>Morus alba</i>	Mulberry Tree	Alien	Tree	3
<i>Oxalis semiloba</i>	Common sorrel	Indigenous	Herb	N/A
<i>Panicum maximum</i>	Guinea grass	Indigenous	Grass	N/A
<i>Paspalum scrobiculatum</i>	Kodo Millet	Alien	Grass	N/A
<i>Pavetta lanceolata</i>	Weeping Brides bush	Indigenous	Tree	N/A
<i>Protorhus longifolia</i>	Red Beech	Indigenous	Tree	N/A
<i>Psidium guajava</i>	Guava tree	Alien	Tree	2

Species name	Common name	Status	Growth form	Category
<i>Psidium guajava</i>	Guava tree	Alien	Tree	2
<i>Rhoicissus digitata</i>	Baboon grape	Indigenous	Climber	N/A
<i>Rhoicissus tomentosa</i>	Wild grape	Indigenous	Climber	N/A
<i>Rhoicissus tomentosa</i>	Wild grape	Indigenous	Climber	N/A
<i>Rhoicissus tridentata</i>	Bushman's grape	Indigenous	Climber	N/A
<i>Rhynchosia caribaea</i>	Monya-mali	Indigenous	Herb	N/A
<i>Rhynchosia caribaea</i>	Monya-mali	Indigenous	Herb	N/A
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	Alien	Tree	1
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	Alien	Tree	1
<i>Searsia chirindensis</i>	Red currant	Indigenous	Tree	N/A
<i>Searsia chirindensis</i>	Red currant	Indigenous	Tree	N/A
<i>Senna bicapsularis</i>	Rambling cassia	Alien	Herb	3
<i>Senna didymobotrya</i>	Peanut butter senna	Alien	Shrub	3
<i>Solanum mauritianum</i>	Bugweed	Alien	Tree	1
<i>Stenotaphrum secundatum</i>	Buffalo grass	Indigenous	Grass	N/A
<i>Strelitzia nicolai</i>	Wild banana	Indigenous	Tree	N/A
<i>Striga asiatica</i>	Witch weed	Indigenous	Herb	N/A
<i>Strychnos usambarensis</i>	Stipe-fruited Strychnos	Indigenous	Herb	N/A
<i>Syzygium cordatum</i>	Umdoni	Indigenous	Tree	N/A
<i>Tagetes minuta</i>	Southern cone marigold	Alien	Herb	N/A
<i>Tithonia diversifolia</i>	Mexican sunflower	Alien	Herb	1
<i>Trema orientalis</i>	Pigeon wood	Indigenous	Tree	N/A
<i>Trema orientalis</i>	Pigeon wood	Indigenous	Tree	N/A
<i>Typha capensis</i>	Bulrush	Indigenous	Sedge	N/A

AREA 4 – LOWER REACHES OF HGM UNIT 1 & XERIC RIVERINE THICKET

Species name	Common name	Status	Growth form	Category
<i>Acacia schweinfurthii</i>	River climbing acacia	Indigenous	Tree	N/A

Species name	Common name	Status	Growth form	Category
<i>Achyranthes aspera</i>	Burweed	Alien	Herb	1
<i>Ageratum conyzoides</i>	Billy goat-weed	Alien	Herb	1
<i>Albizia lebbeck</i>	Lebbeck tree	Alien	Tree	1
<i>Allophylus africanus</i>	Witbos	Indigenous	Tree	N/A
<i>Allophylus africanus</i>	Witbos	Indigenous	Tree	N/A
<i>Aneilema aequinoctiale</i>	Clinging Aneilema	Indigenous	Herb	N/A
<i>Anredera cordifolia</i>	Madeira vine	Alien	Creeper	1
<i>Barleria gueinzii</i>		Indigenous	Herb	N/A
<i>Berkheya bipinnatifida</i>		Indigenous	Herb	N/A
<i>Brachylaena uniflora</i>	Tall Silver Oak	Indigenous	Tree	N/A
<i>Bridelia micrantha</i>	Mitzeerie	Indigenous	Tree	N/A
<i>Canna indica</i>	Canna	Alien	Herb	1
<i>Canthium ciliatum</i>	Hairy Turkey Berry	Indigenous	Tree	N/A
<i>Canthium inerme</i>	Turkey berry	Indigenous	Tree	N/A
<i>Capparis brassii</i>		Indigenous	Climber	N/A
<i>Celtis africana</i>	White stinkwood	Indigenous	Tree	N/A
<i>Chromolaena odorata</i>	Triffid weed	Alien	Herb	1
<i>Clausena anisata</i>	Horsewood	Indigenous	Shrub	N/A
<i>Clausena anisata</i>	Horsewood	Indigenous	Shrub	N/A
<i>Cordia caffra</i>	Septee saucer-berry	Indigenous	Tree	N/A
<i>Crotalaria natalensis</i>		Indigenous	Herb	N/A
<i>Croton sylvaticus</i>	Forest Fever-berry	Indigenous	Tree	N/A
<i>Cryptocarya woodii</i>	Cape Quince	Indigenous	Tree	N/A
<i>Cussonia sphaerocephala</i>	Cabbage tree	Indigenous	Tree	N/A
<i>Cussonia zuluensis</i>	Natal cabbage tree	Indigenous	Tree	N/A



Species name	Common name	Status	Growth form	Category
<i>Cussonia zuluensis</i>	Natal cabbage tree	Indigenous	Tree	N/A
<i>Dalbergia nitidula</i>	Glossy Flat bean	Indigenous	Climber	N/A
<i>Dalbergia obovata</i>	Climbing flat bean	Indigenous	Climber	N/A
<i>Dalbergia obovata</i>	Climbing flat bean	Indigenous	Climber	N/A
<i>Dalbergia obovata</i>	Climbing flat bean	Indigenous	Climber	N/A
<i>Dalbergia obovata</i>	Climbing flat bean	Indigenous	Climber	N/A
<i>Dalbergia obovata</i>	Climbing flat bean	Indigenous	Climber	N/A
<i>Dioscorea cotinifolia</i>	Wild yam	Indigenous	Herb	N/A
<i>Dioscorea cotinifolia</i>	Wild yam	Indigenous	Herb	N/A
<i>Diospyros villosa</i>	Hairy star apple	Indigenous	Tree	N/A
<i>Diospyros villosa</i>	Hairy star apple	Indigenous	Tree	N/A
<i>Dombeya cymosa</i>	Smooth Wild Pair	Indigenous	Tree	N/A
<i>Dovyalis rhamnoides</i>	Sourberry Kei-Apple	Indigenous	Tree	N/A
<i>Ekebergia capensis</i>	Cape ash	Indigenous	Tree	N/A
<i>Euclea daphnoides</i>	White stem guarri	Indigenous	Tree	N/A
<i>Euclea daphnoides</i>	White stem guarri	Indigenous	Tree	N/A
<i>Euphorbia grandidens</i>	Valley bush Euphorbia	Indigenous	Tree	N/A
<i>Euphorbia triangularis</i>	River euphorbia	Indigenous	Succulent Tree	N/A
<i>Euphorbia triangularis</i>	River euphorbia	Indigenous	Succulent Tree	N/A
<i>Ficus natalensis</i>	Natal Fig	Indigenous	Tree	N/A
<i>Ficus natalensis</i>	Natal Fig	Indigenous	Tree	N/A
<i>Ficus sur</i>	Cape fig	Indigenous	Tree	N/A
<i>Ficus sur</i>	Cape fig	Indigenous	Tree	N/A
<i>Harpephyllum caffrum</i>	Wild plum	Indigenous	Tree	N/A
<i>Hippobromus pauciflorus</i>	False horse wood	Indigenous	Shrub	N/A

Species name	Common name	Status	Growth form	Category
<i>Hypoestes aristata</i>	Purple Haze	Indigenous	Herb	N/A
<i>Ipomoea cairica</i>	Morning glory	Alien	Herb	N/A
<i>Ischaemum fasciculatum</i>	Common morning glory	Alien	Creeper	3
<i>Justicia protracta</i>		Indigenous	Herb	N/A
<i>Kalanchoe rotundifolia</i>	Common Kalanchoe	Indigenous	Succulent Herb	N/A
<i>Lantana camara</i>	Tick berry	Alien	Shrub	1
<i>Lantana camara</i>	Tick berry	Alien	Shrub	1
<i>Maytenus peduncularis</i>	Blackwood	Indigenous	Tree	N/A
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<b><i>Millettia grandis</i></b>	<b>Umzimbeet</b>	<b>Protected</b>	<b>Tree</b>	<b>N/A</b>
<b><i>Millettia grandis</i></b>	<b>Umzimbeet</b>	<b>Protected</b>	<b>Tree</b>	<b>N/A</b>
<b><i>Millettia grandis</i></b>	<b>Umzimbeet</b>	<b>Protected</b>	<b>Tree</b>	<b>N/A</b>
<i>Pachystigma bowkeri</i>	Forest Crown Medlar	Indigenous	Tree	N/A
<i>Pavetta lanceolata</i>	Weeping Brides bush	Indigenous	Tree	N/A
<i>Pavonia columella</i>		Indigenous	Herb	N/A
<i>Phaulopsis imbricata</i>	Himalayan Ruellia	Indigenous	Herb	N/A
<i>Phoenix reclinata</i>	Date Palm	Indigenous	Palm	N/A
<i>Plectranthus saccatus</i>	Stoep Jacaranda	Indigenous	Herb	N/A
<i>Protorhus longifolia</i>	Red Beech	Indigenous	Tree	N/A
<i>Psidium cattleianum</i>	Strawberry guava	Alien	Tree	3
<i>Pupalia lappacea</i>	Forest Bur	Indigenous	Herb	N/A
<i>Putterlickia verrucosa</i>	Mock forest spike thorn	Indigenous	Tree	N/A
<i>Rhinacanthus gracilis</i>		Indigenous	Herb	N/A
<i>Rhoicissus tomentosa</i>	Wild grape	Indigenous	Climber	N/A
<i>Rhoicissus tomentosa</i>	Wild grape	Indigenous	Climber	N/A

Species name	Common name	Status	Growth form	Category
<i>Rothmannia globosa</i>	September Bells	Indigenous	Tree	N/A
<i>Sarcostemma viminale</i>	Rapunzel plant	Indigenous	Climber	N/A
<b><i>Scadoxus membranaceus</i></b>	<b>Dwarf Paintbrush lily</b>	<b>Protected</b>	<b>Herb</b>	<b>N/A</b>
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	Alien	Tree	1
<i>Schotia brachypetala</i>	African Walnut	Indigenous	Tree	N/A
<i>Scolopia zeyheri</i>	Red pear	Indigenous	Tree	N/A
<i>Searsia chirindensis</i>	Red currant	Indigenous	Tree	N/A
<i>Searsia nebulosa</i>	Sand Currant	Indigenous	Tree	N/A
<i>Secamone gerrardii</i>	Gerrard's Secamone	Indigenous	Climbers	N/A
<i>Secamone gerrardii</i>	Gerrard's Secamone	Indigenous	Climbers	N/A
<i>Senecio chrysocoma</i>		Indigenous	Herb	N/A
<i>Senecio helminthioides</i>		Indigenous	Herb	N/A
<i>Setaria megaphylla</i>	Broad-leafed bristle grass	Indigenous	Grass	N/A
<i>Setaria sagittifolia</i>	Broad-leafed bristle grass	Indigenous	Grass	N/A
<i>Setaria sagittifolia</i>	Broad-leafed bristle grass	Indigenous	Grass	N/A
<i>Sida cordifolia</i>	Spider leg	Indigenous	Herb	N/A
<i>Sida dregei</i>	Spider leg	Indigenous	Herb	N/A
<b><i>Sideroxylon inerme</i></b>	<b>White milk wood</b>	<b>Protected</b>	<b>Tree</b>	<b>N/A</b>
<i>Solanum mauritianum</i>	Bugweed	Alien	Tree	1
<i>Syzygium cordatum</i>	Umdoni	Indigenous	Tree	N/A
<i>Syzygium cordatum</i>	Umdoni	Indigenous	Tree	N/A
<i>Tarenna pavettoides</i>	Large-leafed Tarenna	Indigenous	Tree	N/A
<i>Tephrosia polystachya</i>	Pioneer Tephrosia	Indigenous	Herb	N/A
<i>Trema orientalis</i>	Pigeon wood	Indigenous	Tree	N/A
<i>Tricalysia lanceolata</i>	Coast Jackal Coffee	Indigenous	Tree	N/A

Species name	Common name	Status	Growth form	Category
<i>Trichilia emetica</i>	Natal mahogany	Indigenous	Tree	N/A
<i>Turraea floribunda</i>	Honey suckle tree	Indigenous	Tree	N/A
<i>Turraea floribunda</i>	Honey suckle tree	Indigenous	Tree	N/A
<i>Turraea obtusifolia</i>	Small Honey Suckle Tree	Indigenous	Tree	N/A
<i>Uvaria caffra</i>	Small Fruit Cluster Pear	Indigenous	Climber	N/A
<i>Vitellariopsis marginata</i>	Forest Bush-Milkwood	Indigenous	Tree	N/A

#### AREA 5 –SCARP FOREST WITH XERIC RIVERINE THICKET ELEMENTS

Species name	Common name	Status	Growth form	Category
<i>Acacia schweinfurthii</i>	River climbing acacia	Indigenous	Tree	N/A
<i>Achyranthes aspera</i>	Burweed	Alien	Herb	1
<i>Agave sisalana</i>	Sisal	Alien	Succulent	2
<i>Allophylus africanus</i>	Witbos	Indigenous	Tree	N/A
<i>Aloe pluridens</i>	French aloe	Indigenous	Succulent	N/A
<i>Anredera cordifolia</i>	Madeira vine	Alien	Creeper	1
<i>Anredera cordifolia</i>	Madeira vine	Alien	Creeper	1
<i>Barleria gueinzii</i>		Indigenous	Herb	N/A
<i>Berkheya bipinnatifida</i>		Indigenous	Herb	N/A
<i>Berkheya bipinnatifida</i>		Indigenous	Herb	N/A
<i>Brachylaena discolor</i>	Silver oak	Indigenous	Tree	N/A
<i>Calpurnia aurea</i> subsp. <i>aurea</i>	Showy Calpurnia	Indigenous	Tree	N/A
<i>Canthium ciliatum</i>	Hairy Turkey Berry	Indigenous	Tree	N/A
<i>Canthium ciliatum</i>	Hairy Turkey Berry	Indigenous	Tree	N/A
<i>Canthium ciliatum</i>	Hairy Turkey Berry	Indigenous	Tree	N/A
<i>Canthium ciliatum</i>	Hairy Turkey Berry	Indigenous	Tree	N/A
<i>Capparis brassii</i>		Indigenous	Climber	N/A
<i>Cardiospermum grandiflorum</i>	Balloon vine	Alien	Herb	1
<i>Celtis africana</i>	White stinkwood	Indigenous	Tree	N/A

<b>Species name</b>	<b>Common name</b>	<b>Status</b>	<b>Growth form</b>	<b>Category</b>
<i>Chaetachme aristata</i>	Thorny elm	Indigenous	Herb	N/A
<i>Chromolaena odorata</i>	Triffid weed	Alien	Herb	1
<i>Chromolaena odorata</i>	Triffid weed	Alien	Herb	1
<i>Chromolaena odorata</i>	Triffid weed	Alien	Herb	1
<i>Clausena anisata</i>	Horsewood	Indigenous	Shrub	N/A
<i>Commiphora woodii</i>	Forest corkwood	Indigenous	Tree	N/A
<i>Commiphora woodii</i>	Forest corkwood	Indigenous	Tree	N/A
<i>Cordia caffra</i>	Septee saucer-berry	Indigenous	Tree	N/A
<i>Cordia caffra</i>	Septee saucer-berry	Indigenous	Tree	N/A
<i>Cordia caffra</i>	Septee saucer-berry	Indigenous	Tree	N/A
<i>Crassula foveata</i> <sup>2</sup>		<b>Indigenous</b>	<b>Succulent</b>	<b>N/A</b>
<i>Cryptocarya woodii</i>	Cape Quince	Indigenous	Tree	N/A
<i>Cussonia zuluensis</i>	Natal cabbage tree	Indigenous	Tree	N/A
<i>Cussonia zuluensis</i>	Natal cabbage tree	Indigenous	Tree	N/A
<i>Dalbergia obovata</i>	Climbing flat bean	Indigenous	Climber	N/A
<i>Dicliptera heterostegia</i>		Indigenous	Herb	N/A
<i>Dietes iridoides</i>	Wood Iris	Indigenous	Herb	N/A
<i>Dombeya rotundifolia</i>	Wild pear	Indigenous	Tree	N/A
<i>Euclea crispa</i>	Blue guarri	Indigenous	Tree	N/A
<i>Ficus burkei</i>	Common wild fig	Indigenous	Tree	N/A
<i>Flagellaria guineensis</i>	Climbing bamboo	Indigenous	Herb	N/A
<i>Gymnosporia buxifolia</i>	Common spike-thorn	Indigenous	Tree	N/A
<b><i>Haemanthus albiflos</i></b>	<b>White Paint Brush</b>	<b>Protected</b>	<b>Herb</b>	<b>N/A</b>
<i>Harpephyllum caffrum</i>	Wild plum	Indigenous	Tree	N/A
<i>Hibiscus calyphyllus</i>	Large Yellow Wild Hibiscus	Indigenous	Shrub	N/A
<i>Hippobromus pauciflorus</i>	False horse wood	Indigenous	Shrub	N/A

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<sup>2</sup> RARE

<b>Species name</b>	<b>Common name</b>	<b>Status</b>	<b>Growth form</b>	<b>Category</b>
<i>Ipomoea cairica</i>	Morning glory	Alien	Herb	N/A
<i>Justicia campylostemon</i>		Indigenous	Herb	N/A
<i>Justicia petiolaris</i>		Indigenous	Herb	N/A
<i>Justicia petiolaris</i>		Indigenous	Herb	N/A
<i>Lagynias lasiantha</i>	Smooth Pendant Medlar	Indigenous	Tree	N/A
<i>Lantana camara</i>	Tick berry	Alien	Shrub	1
<i>Litsea glutinosa</i>	India laurel	Alien	Tree	1
<i>Litsea glutinosa</i>	India laurel	Alien	Tree	1
<i>Marsdenia floribunda</i>	Madagascar Jasmin	Alien	Herb	N/A
<i>Obetia tenax</i>	Mountain Nettle	Indigenous	Shrub	N/A
<i>Obetia tenax</i>	Mountain Nettle	Indigenous	Shrub	N/A
<i>Ochna natalitia</i>	Natal Plane	Indigenous	Tree	N/A
<i>Panicum maximum</i>	Guinea grass	Indigenous	Grass	N/A
<i>Pavetta lanceolata</i>	Weeping Brides bush	Indigenous	Tree	N/A
<i>Pavetta lanceolata</i>	Weeping Brides bush	Indigenous	Tree	N/A
<i>Petopentia natalensis</i>	Propeller Vine	Indigenous	Liana	<b>N/A</b>
<i>Putterlickia verrucosa</i>	Mock forest spike thorn	Indigenous	Tree	N/A
<b><i>Resnova humifusa</i></b>		<b>Protected</b>	<b>Herb</b>	<b>N/A</b>
<i>Rhoicissus digitata</i>	Baboon grape	Indigenous	Climber	N/A
<i>Rhoicissus tomentosa</i>	Wild grape	Indigenous	Climber	N/A
<i>Rivina humilis</i>	Blood berry	Alien	Herb	1
<i>Rubus cuneifolius</i>	American bramble	Alien	Shrub	1
<i>Ruttya ovata</i>	Ruttya	Indigenous	Tree	N/A
<i>Sarcostemma viminale</i>	Rapunzel plant	Indigenous	Climber	N/A
<b><i>Scadoxus membranaceus</i></b>	<b>Dwarf Paintbrush lily</b>	<b>Protected</b>	<b>Herb</b>	<b>N/A</b>
<b><i>Scadoxus puniceus</i></b>	<b>Paintbrush lily</b>	<b>Protected</b>	<b>Herb</b>	<b>N/A</b>
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	Alien	Tree	1
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	Alien	Tree	1

<b>Species name</b>	<b>Common name</b>	<b>Status</b>	<b>Growth form</b>	<b>Category</b>
<i>Schotia brachypetala</i>	African Walnut	Indigenous	Tree	N/A
<i>Scolopia zeyheri</i>	Red pear	Indigenous	Tree	N/A
<i>Searsia chirindensis</i>	Red currant	Indigenous	Tree	N/A
<i>Searsia chirindensis</i>	Red currant	Indigenous	Tree	N/A
<i>Searsia pyroides</i> var.		Indigenous	Tree	N/A
<i>Secamone gerrardii</i>	Gerrard's Secamone	Indigenous	Climbers	N/A
<i>Senecio tamoides</i>	Canary creeper	Indigenous	Creeper	N/A
<i>Setaria megaphylla</i>	Broad-leafed bristle grass	Indigenous	Grass	N/A
<b><i>Sideroxylon inerme</i></b>	<b>White milk wood</b>	<b>Protected</b>	<b>Tree</b>	<b>N/A</b>
<i>Solanum mauritianum</i>	Bugweed	Alien	Tree	1
<b><i>Stellarioides longibracteata</i></b>	<b>Sea Onion</b>	<b>Protected</b>	<b>Bulb</b>	<b>N/A</b>
<i>Tagetes minuta</i>	Southern cone marigold	Alien	Herb	N/A
<i>Trema orientalis</i>	Pigeon wood	Indigenous	Tree	N/A
<i>Trimeria grandifolia</i>	Wild mulberry	indigenous	Tree	N/A
<i>Turraea floribunda</i>	Honey suckle tree	Indigenous	Tree	N/A

AREA 6 – ROADWAY LEADING TO FARM MANAGERS DWELLING AND DWELLING AREA

<b>Species name</b>	<b>Common name</b>	<b>Status</b>	<b>Growth form</b>	<b>Category</b>
<i>Acacia xanthophloea</i>	Fever tree	Indigenous	Tree	N/A
<i>Ageratum conyzoides</i>	Billy goat-weed	Alien	Herb	1
<i>Apodytes dimidiata</i>	White pear	Indigenous	Tree	N/A
<i>Canthium inerme</i>	Turkey berry	Indigenous	Tree	N/A
<i>Cestrum laevigatum</i>	Ink berry	Alien	Herb	1
<i>Chromolaena odorata</i>	Triffid weed	Alien	Herb	1
<i>Cycas</i> sp.		Alien	Tree	N/A
<i>Delonix regia</i>	Flamboyant	Alien	Tree	N/A
<i>Diospyros lycioides</i>	Blue bush	Indigenous	Tree	N/A
<i>Erythrina lysistemon</i>	Coral tree	Indigenous	Tree	N/A

Species name	Common name	Status	Growth form	Category
<i>Eucalyptus grandis</i>	Rose gum	Alien	Tree	2
<i>Euphorbia pulcherrima</i>	Poinsettia	Alien	Shrub	N/A
<i>Ficus burkei</i>	Common wild fig	Indigenous	Tree	N/A
<i>Ficus sur</i>	Cape fig	Indigenous	Tree	N/A
<i>Gymnosporia buxifolia</i>	Common spike-thorn	Indigenous	Tree	N/A
<i>Hedychium coronarium</i>	White Ginger lily	Alien	Shrub	1
<i>Hibiscus calyphyllus</i>	Large Yellow Wild Hibiscus	Indigenous	Shrub	N/A
<i>Hippobromus pauciflorus</i>	False horse wood	Indigenous	Shrub	N/A
<i>Lantana camara</i>	Tick berry	Alien	Shrub	1
<i>Litsea glutinosa</i>	India laurel	Alien	Tree	1
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<i>Mirabilis jalapa</i>	Marvel of Peru	Alien	Herb	N/A
<i>Pavetta lanceolata</i>	Weeping Brides bush	Indigenous	Tree	N/A
<i>Phoenix reclinata</i>	Date Palm	Indigenous	Palm	N/A
<i>Protorhus longifolia</i>	Red Beech	Indigenous	Tree	N/A
<i>Psidium guajava</i>	Guava tree	Alien	Tree	2
<i>Rivina humilis</i>	Blood berry	Alien	Herb	1
<i>Sansevieria hyacinthoides</i>	Mother-in-laws tongue	Indigenous	Herb	N/A
<i>Schotia brachypetala</i>	African Walnut	Indigenous	Tree	N/A
<i>Senecio madagascarensis</i>		Indigenous	Herb	N/A
<i>Setaria megaphylla</i>	Broad-leafed bristle grass	Indigenous	Grass	N/A
<i>Solanum mauritianum</i>	Bugweed	Alien	Tree	1
<i>Solanum mauritianum</i>	Bugweed	Alien	Tree	1
<i>Sphagneticola triloba</i>	Singapore Daisy	Alien	Herb	N/A
<i>Trichilia emetica</i>	Natal mahogany	Indigenous	Tree	N/A
<i>Trichilia emetica</i>	Natal mahogany	Indigenous	Tree	N/A



AREA 7 – ISOLATED WOODY FRAGMENT ALONG SUGAR CANE ROAD PERPENDICULAR TO THE M27

Species name	Common name	Status	Growth form	Category
<i>Abutilon sonneratianum</i>	Wild hibiscus	Indigenous	Herb	N/A
<i>Acacia natalitia</i>	Coastal Sweet Thorn	Indigenous	Tree	N/A
<i>Achyranthes aspera</i>	Burweed	Alien	Herb	1
<i>Acokanthera oppositifolia</i>	Dune Poison Bush	Indigenous	Tree	N/A
<i>Allophylus africanus</i>	Witbos	Indigenous	Tree	N/A
<i>Apodytes dimidiata</i>	White pear	Indigenous	Tree	N/A
<i>Asystasia gangetica</i>	Creeping Foxglove	Alien	Herb	N/A
<i>Barleria gueinzii</i>		Indigenous	Herb	N/A
<i>Berkheya bipinnatifida</i>		Indigenous	Herb	N/A
<i>Brachylaena discolor</i>	Silver oak	Indigenous	Tree	N/A
<i>Burchellia bubalina</i>	Wild Pomegranate	Indigenous	Tree	N/A
<i>Cadaba natalensis</i>	Natal Worm Bush	Indigenous	Shrub	N/A
<i>Carissa bispinosa</i>	Num-num	Indigenous	Tree	N/A
<i>Chaetachme aristata</i>	Thorny elm	Indigenous	Herb	N/A
<i>Clausena anisata</i>	Horsewood	Indigenous	Shrub	N/A
<i>Clausena anisata</i>	Horsewood	Indigenous	Shrub	N/A
<i>Clerodendrum glabrum</i>	Tinder wood	Indigenous	Tree	N/A
<i>Clerodendrum glabrum</i>	Tinder wood	Indigenous	Tree	N/A
<i>Coddia rudis</i>	Small bone apple	Indigenous	Tree	N/A
<i>Cussonia zuluensis</i>	Natal cabbage tree	Indigenous	Tree	N/A
<i>Cyperus textilis</i>	Mat Sedge	Indigenous	Sedge	N/A
<i>Dioscorea cotinifolia</i>	Wild yam	Indigenous	Herb	N/A
<i>Distephanus anisochaetoides</i>		Indigenous	Herb	N/A
<i>Euclea crispa</i>	Blue guarri	Indigenous	Tree	N/A
<i>Euclea crispa</i>	Blue guarri	Indigenous	Tree	N/A
<i>Ficus burkei</i>	Common wild fig	Indigenous	Tree	N/A
<i>Flagellaria guineensis</i>	Climbing bamboo	Indigenous	Herb	N/A

Species name	Common name	Status	Growth form	Category
<i>Grewia occidentalis</i>	Cross berry	Indigenous	Tree	N/A
<i>Grewia occidentalis</i>	Cross berry	Indigenous	Tree	N/A
<i>Grewia occidentalis</i>	Cross berry	Indigenous	Tree	N/A
<i>Gymnosporia buxifolia</i>	Common spike-thorn	Indigenous	Tree	N/A
<i>Hewittia malabarica</i>		Indigenous	Herb	N/A
<i>Hippobromus pauciflorus</i>	False horse wood	Indigenous	Shrub	N/A
<i>Hypoestes aristata</i>	Purple Haze	Indigenous	Herb	N/A
<i>Ipomoea cairica</i>	Morning glory	Alien	Herb	N/A
<i>Isoglossa</i> sp.		Indigenous	Herb	N/A
<i>Kraussia floribunda</i>	Rhino coffee	Indigenous	Tree	N/A
<i>Maytenus peduncularis</i>	Blackwood	Indigenous	Tree	N/A
<i>Maytenus peduncularis</i>	Blackwood	Indigenous	Tree	N/A
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<i>Opuntia ficus-indica</i>	Prickly pear	Alien	Succulent tree	1
<i>Pavetta lanceolata</i>	Weeping Brides bush	Indigenous	Tree	N/A
<i>Psychotria capensis</i>	Black bird-berry	Indigenous	Tree	N/A
<i>Psydrax locuples</i>	Sand Quar	Indigenous	Tree	N/A
<i>Putterlickia verrucosa</i>	Mock forest spike thorn	Indigenous	Tree	N/A
<i>Putterlickia verrucosa</i>	Mock forest spike thorn	Indigenous	Tree	N/A
<i>Rhoicissus tridentata</i>	Bushman's grape	Indigenous	Climber	N/A
<i>Sansevieria hyacinthoides</i>	Mother-in-laws tongue	Indigenous	Herb	N/A
<b><i>Scadoxus puniceus</i></b>	<b>Paintbrush lily</b>	<b>Protected</b>	<b>Herb</b>	<b>N/A</b>
<i>Scolopia zeyheri</i>	Red pear	Indigenous	Tree	N/A
<i>Searsia chirindensis</i>	Red currant	Indigenous	Tree	N/A
<i>Searsia rigida</i>		Indigenous	Tree	N/A
<i>Secamone gerrardii</i>	Gerrard's Secamone	Indigenous	Climbers	N/A
<i>Solanum mauritianum</i>	Bugweed	Alien	Tree	1
<i>Trimeria grandifolia</i>	Wild mulberry	indigenous	Tree	N/A

Species name	Common name	Status	Growth form	Category
<i>Turraea floribunda</i>	Honey suckle tree	Indigenous	Tree	N/A
<i>Turraea floribunda</i>	Honey suckle tree	Indigenous	Tree	N/A
<i>Zanthoxylum capense</i>	Small knob wood	Indigenous	Tree	N/A
<i>Zanthoxylum capense</i>	Small knob wood	Indigenous	Tree	N/A
<i>Ziziphus mucronata</i>	Blinkblaar-wag-n-bietjie	Indigenous	Tree	N/A

#### AREA 8 – HGM UNIT 4

Species name	Common name	Status	Growth form	Category
<i>Apodytes dimidiata</i>	White pear	Indigenous	Tree	N/A
<i>Berkheya bipinnatifida</i>		Indigenous	Herb	N/A
<i>Bridelia micrantha</i>	Mitzeerie	Indigenous	Tree	N/A
<i>Cestrum laevigatum</i>	Ink berry	Alien	Herb	1
<i>Dalbergia obovata</i>	Climbing flat bean	Indigenous	Climber	N/A
<i>Dioscorea cotinifolia</i>	Wild yam	Indigenous	Herb	N/A
<i>Eucalyptus grandis</i>	Rose gum	Alien	Tree	2
<i>Euphorbia pulcherrima</i>	Poinsettia	Alien	Shrub	N/A
<i>Ficus sur</i>	Cape fig	Indigenous	Tree	N/A
<i>Ficus sur</i>	Cape fig	Indigenous	Tree	N/A
<i>Ipomoea purpurea</i>	Common morning glory	Alien	Creeper	3
<i>Ischaemum afrum</i>	Common morning glory	Alien	Creeper	3
<i>Ischaemum fasciculatum</i>	Common morning glory	Alien	Creeper	3
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<i>Paspalum urvillei</i>	Vasey grass	Alien	Grass	N/A
<i>Rubus cuneifolius</i>	American bramble	Alien	Shrub	1
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	Alien	Tree	1
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	Alien	Tree	1
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	Alien	Tree	1

Species name	Common name	Status	Growth form	Category
<i>Searsia chirindensis</i>	Red currant	Indigenous	Tree	N/A
<i>Senna bicapsularis</i>	Rambling cassia	Alien	Herb	3
<i>Solanum mauritianum</i>	Bugweed	Alien	Tree	1
<i>Sorghum halepense</i>	Johnson grass	Alien	Grass	2
<i>Trema orientalis</i>	Pigeon wood	Indigenous	Tree	N/A

#### AREA 9 – OHLANGA FLOODPLAIN

Species name	Common name	Status	Growth form	Category
<i>Albizia adianthifolia</i>	Flat crown	Indigenous	Tree	N/A
<i>Arundo donax</i>	Spanish reed	Alien	Grass	1
<i>Bambusoideae</i>	Bamboo	Alien	Tree	N/A
<i>Bambusoideae</i>	Bamboo	Alien	Tree	N/A
<i>Bridelia micrantha</i>	Mitzeerie	Indigenous	Tree	N/A
<i>Gymnosporia arenicola</i>	Coast spike-thorn	Indigenous	Tree	N/A
<i>Gymnosporia buxifolia</i>	Common spike-thorn	Indigenous	Tree	N/A
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<i>Melia azedarach</i>	Syringa	Alien	Tree	3
<i>Psidium guajava</i>	Guava tree	Alien	Tree	2
<i>Schinus terebinthifolius</i>	Brazilian pepper tree	Alien	Tree	1



## **APPENDIX 2: MAPS**



**MAP 1**

**AERIAL MAP**

# CORNUBIA NORTH ECOLOGICAL ASSESSMENT

## Aerial Map

### Legend

Site Boundary

#### Protected Species

- *Barringtonia racemosa*
- *Cassula foveata*, *Resnoia humifusa*,  
*Haemanthus albiflos*
- *Haemanthus albiflos*
- *Miletia grandis*
- *Scadoxus puniceus*
- *Scadoxus puniceus*, *S. membranaceus*
- *Sideroxylon inerme*
- *Stelariodes longibracteata*

- Avenue of *Syzygium cordatum*
- Woody vegetation largely indigenous
- *Cyperus dives*
- Alien vegetation dominated
- *Eucalyptus grandis* dominated scrub
- Understorey alien vegetation dominated
- *Schinus terebinthifolius* dominated scrub
- Substation
- Storage area
- Homesteads
- Old homestead
- Labourer housing
- Dumping area
- Dams
- Bambusoideae dominated
- Borrow pit

SOURCE: Chief Directorate of Survey and Mapping



0 0.88 0.16  
Kilometers



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**CORNUBIA NORTH**





**MAP 2**

**BIODIVERSITY NOTEWORTHINESS MAP**

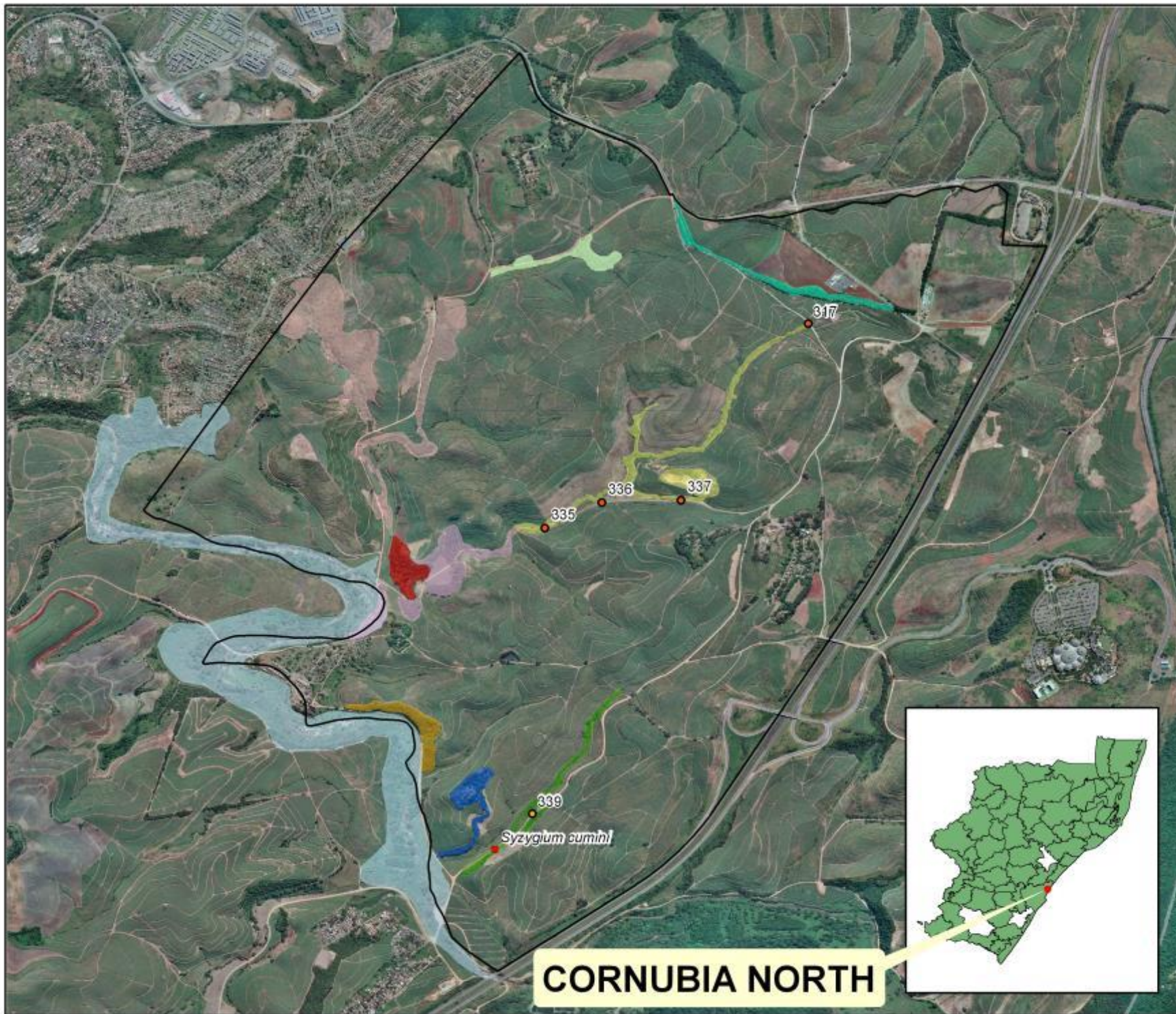


# CORNUBIA NORTH ECOLOGICAL ASSESSMENT

## Biodiversity Noteworthiness

### Legend

-  Site Boundary
-  Alien
-  HGM 1
-  HGM 2
-  HGM 3
-  Area 4
-  Area 5
-  Area 6
-  Area 7
-  Area 8
-  Area 9



**CORNUBIA NORTH**

SOURCE: Chief Directorate of Survey and Mapping



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