

**THE UPGRADING OF NATIONAL ROUTE R63 SECTION 13 BETWEEN FORT BEAUFORT  
(KM 35.77) AND ALICE (KM 58.86) WITHIN THE NKONKBE LOCAL MUNICIPALITY OF  
THE EASTERN CAPE PROVINCE**

**ECOLOGICAL IMPACT ASSESSMENT**

*CONTRACT NRA R.063-130-2015/1ENV*

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**REVISIONS TRACKING TABLE****EOH Coastal and Environmental Services**

**Report Title:** The Upgrading of National Route R63 Section 13 Between Fort Beaufort (Km 35.77) and Alice (KM 58.86) within the Nkonkbe Local Municipality of the Eastern Cape Province  
Ecological Impact Assessment

**Report Version:** Draft

**Project Number:** 270

Name	Responsibility	Signature	Date
Peter De Lacy	Ecological Specialist		
Dr C Mack	Report Reviewer		

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## INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

In terms of Appendix 6 of the Environmental Impact Assessment Regulations (G. NR. 982) as regulated by the National Environmental Management Act (Act no. 107 of 1998 and amended in 2014; NEMA), a Specialist Report must contain all the information necessary for a proper understanding of the nature of issues identified, and must include–

1. (1) A specialist report prepared in terms of the NEMA 2014 Regulations must contain-
  - (a) details of-
    - (i) the specialist who prepared the report; and
    - (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;
  - (b) a declaration that the specialist 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) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;
  - (e) a description of the methodology adopted in preparing the report or carrying out the specialised process;
  - (f) the specific identified sensitivity of the site related to the activity and its associated structures and infrastructure;
  - (g) an identification of any areas to be avoided, including buffers;
  - (h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;
  - (i) a description of any assumptions made and any uncertainties or gaps in knowledge;
  - (j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment;
  - (k) any mitigation measures for inclusion in the EMPr;
  - (l) any conditions for inclusion in the environmental authorisation;
  - (m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;
  - (n) a reasoned opinion-
    - (i) as to whether the proposed activity or portions thereof should be authorised; and
    - (ii) if the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;
  - (o) a description of any consultation process that was undertaken during the course of preparing the specialist report;
  - (p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and
  - (q) any other information requested by the competent authority.

## TABLE OF CONTENTS

<b>1</b>	<b>THE PROJECT TEAM</b> .....	<b>1</b>
1.1	Details of specialist .....	1
1.2	Expertise.....	1
1.3	Declaration .....	2
<b>2</b>	<b>INTRODUCTION</b> .....	<b>1</b>
2.1	Project description and location .....	1
2.2	Terms of Reference .....	1
2.3	Methodology .....	2
2.3.1	<i>Species of conservation concern</i> .....	2
2.3.2	<i>Sampling protocol</i> .....	3
2.3.3	<i>Vegetation mapping</i> .....	3
2.3.4	<i>Sensitivity assessment</i> .....	4
2.3.5	<i>Biodiversity</i> .....	5
2.3.6	<i>Protected Areas</i> .....	5
2.4	Impact assessment.....	6
2.4.1	<i>Impact rating methodology</i> .....	6
2.5	Assumptions and Limitations .....	9
<b>3</b>	<b>RELEVANT LEGISLATION</b> .....	<b>1</b>
<b>4</b>	<b>DESCRIPTION OF THE ENVIRONMENT</b> .....	<b>1</b>
4.1	Background and Literature review.....	1
4.1.1	<i>Climate</i> .....	1
4.1.2	<i>Topography, Geology and soils</i> .....	1
4.2	Vegetation and Floristics.....	3
4.2.1	<i>SANBI classification (Mucina and Rutherford, 2006)</i> .....	3
4.2.2	<i>Forest classification</i> .....	4
4.3	Waterbodies .....	<b>Error! Bookmark not defined.</b>
4.4	Land use.....	5
4.5	Biodiversity Conservation .....	7
4.5.1	<i>Protected Areas (NEMPAA &amp; NPAES)</i> .....	7
4.5.2	<i>Threatened ecosystems</i> .....	<b>Error! Bookmark not defined.</b>
4.5.3	<i>Eastern Cape Biodiversity Conservation Plan</i> .....	7
4.5.4	<i>Conservation Status of plant species: Rare, or Threatened species</i> .....	8
<b>5</b>	<b>SITE OBSERVATIONS AND DESCRIPTIONS</b> .....	<b>12</b>
5.1	Vegetation types and description .....	12
5.2	Plant Species Observed .....	16
5.3	Alien Invasive Species .....	16
5.4	Animal species.....	16
<b>6</b>	<b>SITE SENSITIVITY</b> .....	<b>17</b>
6.1	Conservation and Spatial Planning Tools.....	17
6.1.1	<i>ECBCP Critical Biodiversity Areas</i> .....	17
6.2	Vegetation .....	17
6.3	Sensitivity map.....	17
6.4	Issues identified .....	18
<b>7</b>	<b>MANNER IN WHICH THE ENVIRONMENT MAY BE AFFECTED</b> .....	<b>19</b>
7.1	Impacts identified.....	19
7.2	Impact assessment.....	20
<b>8</b>	<b>IMPACT STATEMENT, CONCLUSION AND RECOMMENDATIONS</b> .....	<b>24</b>
8.1	Conclusions .....	24
8.2	Current status .....	24
8.3	Recommendations.....	24
8.3.1	<i>Planning and Design Phase</i> .....	24
8.3.2	<i>Construction Phase</i> .....	25
8.3.3	<i>Operational Phase</i> .....	26
8.4	Proposed management plans to be developed and implemented as part of the final EMP	

8.5 Environmental Statement and Opinion of the Specialist..... 27  
**9 REFERENCES..... 28**  
**APPENDIX A..... 30**

**LIST OF FIGURES**

Figure 4.8: National Protected Areas Expansion Strategy map for the proposed Lambasi Feedlot..... **Error! Bookmark not defined.**  
 Figure 4.9: Aquatic Critical Biodiversity Areas of the proposed study area, as per ECBCP. **Error! Bookmark not defined.**  
 Figure 5.1: Vegetation types observed onsite. .... 15  
 Figure 6.1. Sensitivity map for areas surrounding the proposed Lambasi Feedlot. .... 18

**LIST OF TABLES**

Table 2.1. Criteria used for the analysis of the sensitivity of the area. .... 4  
 Table 2.2. Significance Rating Table. .... 7  
 Table 2.3. Impact Severity Rating. .... 8  
 Table 3.1: Environmental legislation considered in the preparation of the Ecological Impact Assessment for the proposed feedlot ..... 1  
 Table 4.1: List of potential plant SCC that may be found onsite ..... 8  
 Table 6.1. Issues identified during the sensitivity assessment of the proposed study site and the different phases of development..... 18  
 Table 7.1. Impacts identified during the phases of the proposed feedlot..... 19  
 Table 7.2. Assessment and mitigation of impacts during all phases of the development..... 21  
 Table 8.1. Assessment of pre- and post-mitigation impact significance. .... 24

## 1 THE PROJECT TEAM

In terms of Appendix 6 of the EIA Regulations (2014) a specialist report must contain-

- (a) details of-
  - (iii) the specialist who prepared the report; and
  - (iv) the expertise of that specialist to compile a specialist report including a curriculum vitae;
- (b) a declaration that the specialist is independent in a form as may be specified by the competent authority;

### 1.1 Details of specialist

#### **Mr Peter De Lacy M.Sc**

*(Ecological Specialist)*

Peter is an environmental consultant. He holds a BSc with majors in Environmental Science and Zoology, as well as a BSc (Hons) in Environmental Science both from Rhodes University. Peter's honours dissertation looked at the growth rate of indigenous street and garden trees and it has subsequently been published in the South African Journal of Botany. His MSc (Environmental Science) thesis was done through Rhodes University and is currently being examined. It looked at the woody species composition and congregant appreciation of the cultural and spiritual services provided by sacred areas in Grahamstown. He has an academic background in a range of fields including Urban Ecology and Forestry, Rehabilitation and Disturbance Ecology, Statistics, Environmental Impact Assessment, and Community-Based Natural Resource Management.

#### **Dr Alan Carter Pr. Sci. Nat.**

*(Report reviewer)*

As Director of the East London Office Alan has extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the USA. He is a member of the American Institute of Certified Public Accountants and holds a PhD in Plant Sciences. He is also a certified ISO14001 EMS auditor with the American National Standards Institute. Alan is registered with both the South African Council for Natural Scientific Professional (SACNASP).

#### **Dr Cherie-Lynn Mack Pr. Sci. Nat.**

*(Report reviewer)*

Principal Environmental Consultant, holds a PhD and MSc (with distinction) degrees in Environmental Biotechnology, with a BSc degree in Microbiology and Biochemistry. She has postgraduate research experience in industrial and domestic wastewater treatment technologies, with particular emphasis on the coal and platinum mining industries. Her interests lie in the water sector, with experience in ecological reserve determination and water quality monitoring and analysis. She has experience in water quality analysis and industrial wastewater treatment research.

### 1.2 Expertise

Projects Peter and Cherie have worked on include:

<b>Name of project</b>	<b>Description of responsibility</b>	<b>Date completed</b>
Element Debe Water Supply Scheme Phase 2 EIA (EC)	Ecological Impact Assessment	March 2016
BCMM Haven Hills Cemetery EIA (EC)	Ecological Impact Assessment	March 2016
InnoWind Riverbank Wind Energy Facility Ground truthing and permitting (EC)	Wetland Impact Assessment	February 2016
Mbhashe Local Municipality Road Upgrade (EC)	Ecological Impact Assessment and Wetland Impact Assessment	June 2015
GIBB SANRAL N2 Green River to Zwelitsha Road Upgrade (EC)	Ecological Impact Assessment	November 2015
GIBB SANRAL N2 Bypass (EC)	Ecological Impact Assessment	February 2016
Expansion of the Mkhambathi Forest Plantation (EC)	Aquatic Impact Assessment	April 2016

### **1.3 Declaration**

- I, Peter De Lacy, declare that, in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014;
- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this report are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

## 2 INTRODUCTION

In terms of Appendix 6 of the EIA Regulations (2014) a specialist report must contain-

- (c) an indication of the scope of, and the purpose for which, the report was prepared;
- (d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;
- (e) a description of the methodology adopted in preparing the report or carrying out the specialised process;
- (i) a description of any assumptions made and any uncertainties or gaps in knowledge;
- (o) a description of any consultation process that was undertaken during the course of preparing the specialist report;
- (p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and
- (q) any other information requested by the competent authority.

### 2.1 Project Background

South African National Roads Agency SOC Limited (SANRAL) has appointed V3 Consulting Engineers as Project Managers who have in turn subcontracted EOH Coastal & Environmental Services (EOH) as the project Environmental Assessment Practitioner (EAP). One of the responsibilities of the EAP is to undertake an Environmental Impact Assessment Baseline Sensitivity Assessment for the Proposed Upgrading of the National Route R63 Section 13 between Fort Beaufort (Km 35.77) and Alice (Km 58.86) within the Nkonkobe Local Municipality of the Eastern Cape Province. This report supports the EIA as a specialist Ecological Impact Assessment.

### 2.2 Need and Desirability

The upgrade and maintenance of National Roads is a SANRAL mandate and they are responsible for these activities. Road safety improvements are likely to result in fewer road accidents and improve traffic mobility. Jobs may be created for skilled and semi-skilled workers and there will be an opportunity for skills development during the construction phase. The proposed road upgrade will result in a safer and better quality road for its users by relieving traffic congestion, improving road safety, providing safer overtaking opportunities.

### 2.3 Project Locality

The proposed project is located on National Route R63 Section 13 between Fort Beaufort (Km 35.77) and Alice (Km 58.86) within the Nkonkobe Local Municipality of the Amathole District Municipality in the Eastern Cape Province, as indicated in Figure 2.1 below. The project starts at the intersection between the R67 and the R63 on the section from Adelaide. The route follows the R63 in an easterly direction and continues through the town of Fort Beaufort towards Alice for approximately 23km. The project ends at the Galloway Bridge just before the four-way stop entering the town of Alice.

The major aspects of this project include the following:

- Increasing road reserve width from 30m to a minimum of 50m wide,
- General widening of the existing road cross section for climbing lanes and 2.5m surfaced shoulders. The main carriageway is 6,4m and needs to be increased to 12,4m. The total width with the addition of passing lanes will be 14,6m.
- Substantial vertical and horizontal geometric improvements from generally a 80km/h to 100/120km/h design speed,
- Rehabilitation of pavement structure on existing alignment and construction of new pavement on new alignment, all for which suitable material will need to be sourced,



- Cut faces (existing and new) requiring stabilisation,
- Widening and/or new construction of existing bridges, agricultural underpass and drainage structures.
- Utilising a current Hard Rock Quarry close to Alice that currently belongs to a Community Trust.
- Opening of 7 new borrow pits.

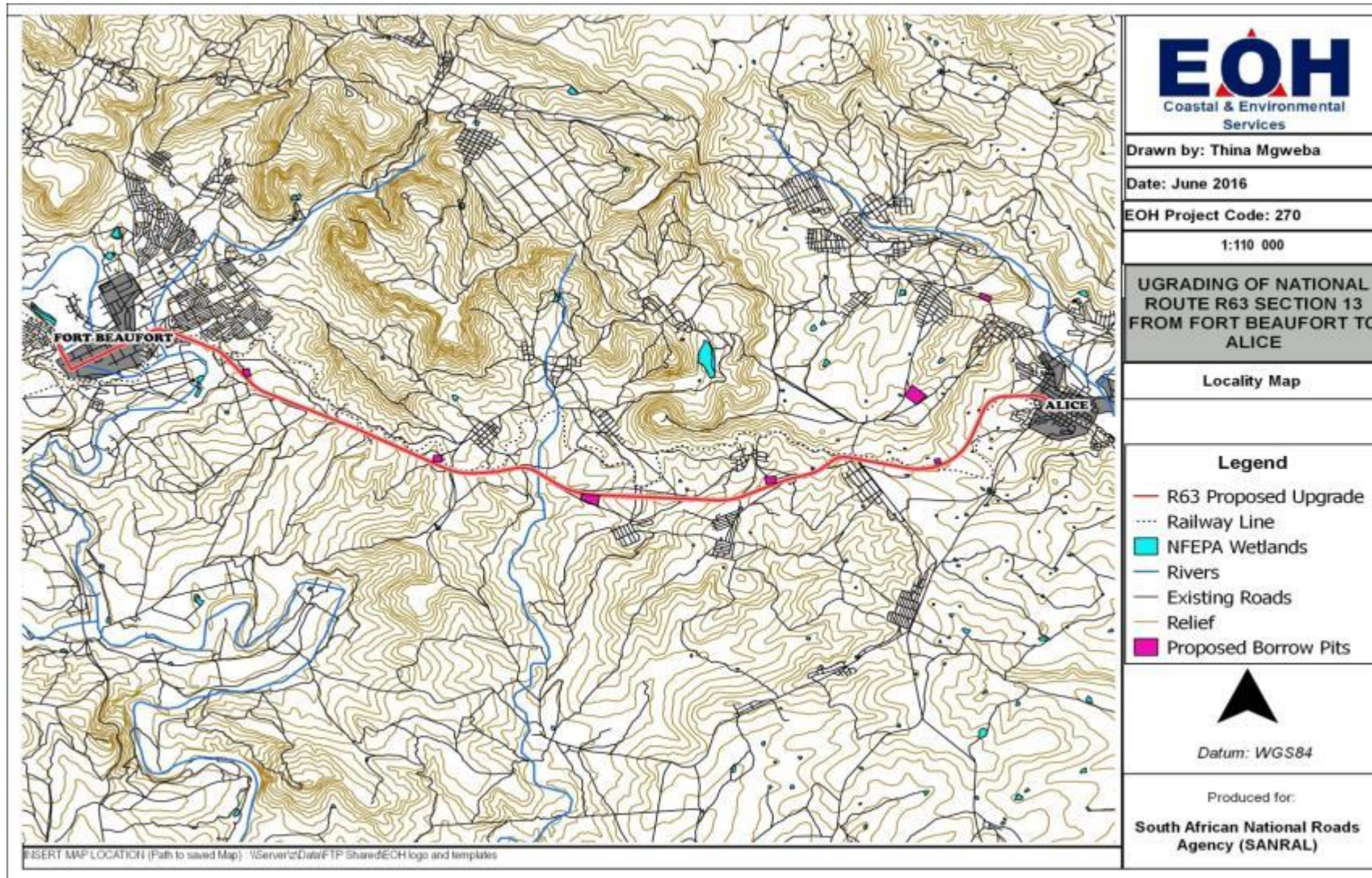


Figure 2.1: Locality Map of the R63 Section 13 Road Upgrade

## 2.4 Terms of Reference

The Terms of Reference (ToR) for the Ecological Impact Assessment are provided below.

A detailed survey of the site will be undertaken to determine the possibility of there being listed threatened or protected ecosystems and species on the proposed project site. If any of these are found, the Environmental Management Programme (EMPr) will include recommended measures to remove or otherwise protect plant species found on the site that are afforded protection under the National Environmental Management: Biodiversity Act (no. 10 of 2004; NEMBA), during construction.

The ToR for an Ecological Impact Assessment includes:

1. Record the plant species that occur within the study area, based on field surveys;
2. Identify, and locate where possible, any plant Species of Conservation Concern (SCC), namely Threatened, Near Threatened, Rare (species with conservation status or which are) and endemic species (to the area);
3. All SCC's will be discussed in detail;
4. Provide a general description of the status of the water resources of the area according to published literature.
5. Provide a sensitivity map of the study areas in order for the proponent to better place the layout of the project's infrastructure;
6. Once a sensitivity map has been created, the consultant must suggest ecological corridors around or adjacent to the suggested project area, especially through sensitive sites or vegetation;
7. Identify and assess the environmental significance of the identified botanical impacts using the methodology prescribed by EOH, as this methodology is compliant with international best practice in EIA; and
8. Provide practical and realistic recommendations to mitigate the identified ecological impacts.

## 2.5 Approach

The study site and surrounding areas were assessed using a two-phased approach. Firstly, a desktop assessment of the site was conducted in terms of current vegetation classifications and biodiversity programmes and plans.

Further to the above, a site visit was conducted on 6 July 2016 in order to assess the actual ecological state and current land-use, identify potential sensitive ecosystems and identify plant species of special concern associated with the proposed project activities. The site visits also served to inform potential impacts of the proposed project and how it may impact on the surrounding ecological environment.

## 2.6 Assumptions and Limitations

This report is based on currently available information and, as a result, the following limitations and assumptions are implicit:–

- The data analysed in this report is based on a single site survey of plant and animal species. Therefore seasonal trends are not assessed. In addition, some plant species, with particular seasonal/short-lived flowering, may have gone undetected.

## 2.7 Methodology

The aim of this assessment is to identify areas of ecological importance and to evaluate these in terms of their conservation importance. In order to do so, the ecological sensitivity of the area is assessed as well as an identification of potential plant Species of Conservation Concern (SCC) that may occur in habitats present in the area.

To a large extent, the condition and sensitivity of the vegetation will also determine the presence of animal SCC and areas with high faunal biodiversity. It is for this reason that the assessment focuses on the vegetation aspects of the site, and includes only a small section on the fauna recorded and expected to live on the site.

It is not the aim of this study to produce a complete list of all animal and plant species occurring in the region, but rather to examine a representative sample. It is however, important to note that areas of high sensitivity as well as SCC have been identified as far as possible, either from records from the site or a review of their habitat requirements, and whether or not these habitats occur within the site. The aim of this study is to identify areas of high sensitivity and those that may be subject to significant impacts from the project. It is important to note that an aquatic impact assessment has been conducted and as such those areas of ecological importance will be included in the sensitivity section of this report. Aspects that would increase impact significance include:

- Presence of plant SCC.
- Presence of animal SCC.
- Vegetation types (which also constitute faunal habitats) of conservation concern.
- Areas of high biodiversity.
- The presence of process areas:
  - Ecological corridors
  - Complex topographical features (especially steep and rocky slopes that provide niche habitats for both plants and animals).

### 2.7.1 Species of conservation concern

#### Plant SCC

Data on the known distribution and conservation status for each potential plant SCC needs to be obtained in order to develop a list of SCC. These plant species are those that may be impacted significantly by the proposed activity. In general these will be species that are already known to be threatened or at risk. Efforts to provide the conservation status ('red list' status) of individual species may provide additional valuable information on SCC (see <http://www.iucnredlist.org/>). Species that are afforded special protection, which are protected by CITES (Convention on International Trade in Endangered Species of Wild Flora and Fauna) are also regarded as SCC (see <http://www.cites.org/>).

#### Animal SCC

Animal SCC in terms of the project area is defined as:

#### ***Threatened species:***

1. Animal species listed in the Endangered or Vulnerable categories in the revised South African Red Data Books (SA RDB – amphibians, du Preez and Carruthers, 2009; reptiles, Branch 1988; birds, SA Birding, 2008; terrestrial mammals, Apps, 2000); and/or
2. Species included in other international lists (e.g., 2010 International Union for Conservation of Nature (IUCN) Red List of Threatened Animals).

## Definitions

The following definitions of the conservation status of plant and animal SCC are provided (Source: SANBI Red Data List):

- **Critically Endangered (CR)** - A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Section V of the Red Data List), and it is therefore considered to be facing an extremely high risk of extinction in the wild.
- **Endangered (EN)** - A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Section V of the Red Data List), and it is therefore considered to be facing a very high risk of extinction in the wild.
- **Vulnerable (VU)** - A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild.
- **Near Threatened (NT)** - A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.
- **Sensitive species** - Species not falling in the categories above but listed in:
  - Appendix 1 or 2 of the Convention of International Trade in Endangered Species (CITES).
- **Endemic species** - Species endemic to South Africa, and more specifically Eastern Cape.
- **Least concern (LC)** – A taxon is of Least Concern when it does not qualify for any of the other categories. Widespread and abundant taxa are typically listed in this category.

### **2.7.2 Sampling protocol**

#### Vegetation

The entire site was observed to evaluate the vegetation of the study area and to add detailed information on the plant communities present. The site observation took into account the amount of time available for the study and limitations such as the seasonality of the vegetation.

Vegetation within the entire site was surveyed and vegetation communities were then described according to the dominant species recorded from each type. These were then mapped and assigned a sensitivity score.

#### Animals

The assessment of animals was based on a general observation of species noted onsite during the site assessment, but with particular consideration of potential animal SCC based on the onsite vegetation.

### **2.7.3 Vegetation mapping**

Mucina and Rutherford (2006) developed the National Vegetation map as part of a South African National Biodiversity Institute (SANBI) funded project: “It was compiled in order to provide floristically based vegetation units of South Africa, Lesotho and Swaziland at a greater level of detail than had been available before.” The map was developed using a wealth of data from several contributors and has allowed for the best national vegetation map to date, the last being that of A.Cocks developed over 50 years ago. The SANBI Vegetation map informs finer scale bioregional plans such as in fall STEP. This SANBI Vegetation map project has two main aims:

- to determine the variation in and units of southern African vegetation based on the analysis and synthesis of data from vegetation studies throughout the region, and



- to compile a vegetation map. The aim of the map was to accurately reflect the distribution and variation on the vegetation and indicate the relationship of the vegetation with the environment. For this reason the collective expertise of vegetation scientists from universities and state departments were harnessed to make this project as comprehensive as possible.

The map and accompanying book describes each vegetation type in detail, along with the most important species including endemic species and those that are biogeographically important. This is the most comprehensive data for vegetation types in South Africa.

This is compared to actual conditions of vegetation observed onsite during the site assessment through mapping from aerial photographs, satellite images, literature descriptions (e.g. SANBI and ECBCP) and related data gathered on the ground.

**2.7.4 Sensitivity assessment**

This section of the report explains the approach to determining the ecological sensitivity of the study area on a broad scale. The approach identifies zones of high, moderate and low sensitivity according to a system developed by EOH and used in numerous ecological studies. It must be noted that the sensitivity zonings in this study are based solely on ecological characteristics and social and economic factors have not been taken into consideration. The sensitivity analysis described here is based on 10 criteria which are considered to be of importance in determining ecosystem and landscape sensitivity. The method predominantly involves identifying sensitive vegetation or habitat types, topography and land transformation (Table 2.1).

Although very simple, this method of analysis provides a good, yet conservative and precautionary assessment of the ecological sensitivity.

**Table 2.1. Criteria used for the analysis of the sensitivity of the area.**

CRITERIA		LOW SENSITIVITY	MODERATE SENSITIVITY	HIGH SENSITIVITY
1	<b>Topography</b>	Level or even	Undulating; fairly steep slopes	Complex and uneven with steep slopes
2	<b>Vegetation</b> - Extent or habitat type in the region	Extensive	Restricted to a particular region / zone	Restricted to a specific locality / site
3	<b>Conservation status</b> of fauna / flora or habitats	Well conserved independent of conservation value	Not well conserved, moderate conservation value	Not conserved - has a high conservation value
4	<b>Species of special concern</b> - Presence and number	None, although occasional regional endemics	No endangered or vulnerable species, some indeterminate or rare endemics	One or more endangered and vulnerable species, or more than 2 endemics or rare species
5	<b>Habitat fragmentation</b> leading to loss of viable populations	Extensive areas of preferred habitat present elsewhere in region not susceptible to fragmentation	Reasonably extensive areas of preferred habitat elsewhere and habitat susceptible to fragmentation	Limited areas of this habitat, susceptible to fragmentation
6	<b>Biodiversity</b> contribution	Low diversity or species richness	Moderate diversity, and moderately high species richness	High species diversity, complex plant and animal communities
7	<b>Visual quality</b> of the site or landscape from other vantage points	Site is hidden or barely visible from any vantage points with the exception in some cases from the	Site is visible from some or a few vantage points but is not obtrusive or very conspicuous	Site is visible from many or all angles or vantage points

CRITERIA		LOW SENSITIVITY	MODERATE SENSITIVITY	HIGH SENSITIVITY
		sea		
8	<b>Erosion potential</b> or instability of the region	Very stable and an area not subjected to erosion	Some possibility of erosion or change due to episodic events	Large possibility of erosion, change to the site or destruction due to climatic or other factors
9	<b>Rehabilitation potential</b> of the area or region	Site is easily rehabilitated	There is some degree of difficulty in rehabilitation of the site	Site is difficult to rehabilitate due to the terrain, type of habitat or species required to reintroduce
10	<b>Disturbance</b> due to human habitation or other influences (alien invasive species)	Site is very disturbed or degraded	There is some degree of disturbance of the site	The site is hardly or very slightly impacted upon by human disturbance

A sensitivity map was drawn up with the aid of a satellite image so that the sensitive regions and vegetation types could be plotted. The following was also taken into account:

**2.7.5 Biodiversity**

ECBCP is a detailed, low-level conservation mapping tool for land-use planning purposes. The aim of ECBCP is to map critical biodiversity areas through a systematic conservation planning process. The current biodiversity plan includes the mapping of priority aquatic features, land-use pressures, critical biodiversity areas and develops guidelines for land and resource-use planning and decision-making.

The main outputs of the ECBCP are “critical biodiversity areas” (CBAs), which are allocated the following management categories:

- CBA 1 = Maintain in a natural state
- CBA 2 = Maintain in a near-natural state

Land use outputs not classified as CBAs are called Biodiversity Land Management Classes (BLMCs) and are allocated the following management categories.

- BLMC 3 = Functional Landscapes
- BLMC 4 = Towns & Settlements
- BLMC 4 = Woodlots & Plantations
- BLMC 4 = Cultivated Land

ECBCP maps the CBAs based on extensive biological data and input from key stakeholders. Although ECBCP is mapped at a finer scale than the National Spatial Biodiversity Assessment (Driver et al., 2005) it is still, for the large part, inaccurate and “course”. Therefore it is imperative that the status of the environment, for any proposed development MUST first be verified before the management recommendations associated with the ECBCP are considered (Berliner and Desmet, 2007). It is also important to note that in absence of any other biodiversity plan, the ECBCP has been adopted by the Provincial Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) as a strategic biodiversity plan for the Eastern Cape.

**2.7.6 Protected Areas**

The purposes of identifying areas that are protected according to the National Environmental Management: Protected Areas (Act No. 57 of 2003; NEMPAA) are:

- To protect ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes in a system of protected area.
- To preserve the ecological integrity of these areas.
- To conserve biodiversity in these areas.
- To protect areas representative of all ecosystems, habitats and species naturally occurring in South Africa.
- To protect South Africa's threatened or rare species.
- To protect an area which is vulnerable or ecologically sensitive.
- To assist in ensuring the sustained supply of environmental goods and services.
- To provide for the sustainable use of natural or biological resources.
- To create or augment destinations for nature based tourism.
- To manage the inter-relationship between natural environment biodiversity, human settlement and economic development.
- Generally to contribute to human, social, cultural, spiritual and economic development.
- To rehabilitate and restore degraded ecosystems and promote the recovery of endangered and vulnerable species.

The goal of the National Protected Areas Expansion Strategy (NPAES) is to achieve cost-effective protected area expansion for ecological sustainability and increased resilience to climate change. It sets targets for protected area expansion, provides maps of the most important areas for protected area expansion, and makes recommendations on mechanisms for protected area expansion. The NPAES has classified protected areas into three categories: formally protected areas, informally protected areas and focus areas. Focus areas are large, intact and unfragmented areas suitable for the creation or expansion of large protected areas.

## **2.8 Impact assessment**

### **2.8.1 Impact rating methodology**

To ensure a direct comparison between various specialist studies, a standard rating scale has been defined and will be used to assess and quantify the identified impacts. This is necessary since impacts have a number of parameters that need to be assessed. Five factors need to be considered when assessing the significance of impacts, namely:

- Relationship of the impact to **temporal scales** - the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.
- Relationship of the impact to **spatial scales** - the spatial scale defines the physical extent of the impact.
- The severity of the impact - the **severity/beneficial scale** is used in order to scientifically evaluate how severe negative impacts would be, or how beneficial positive impacts would be on a particular affected system (for ecological impacts) or a particular affected party.
- The severity of impacts can be evaluated with and without **mitigation** in order to demonstrate how serious the impact is when nothing is done about it. The word 'mitigation' means not just 'compensation', but also the ideas of containment and remedy. For beneficial impacts, optimization means anything that can enhance the benefits. However, mitigation or optimization must be practical, technically feasible and economically viable.



- The **likelihood** of the impact occurring - the likelihood of impacts taking place as a result of project actions differs between potential impacts. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.
- Each criterion is ranked with scores assigned as presented in Table 3-2 to determine the **overall significance** of an activity. The criterion is then considered in two categories, viz. effect of the activity and the likelihood of the impact. The total scores recorded for the effect and likelihood are then read off the matrix presented in Table 3-3, to determine the overall significance of the impact. The overall significance is either negative or positive.
- The **significance scale** is an attempt to evaluate the importance of a particular impact. This evaluation needs to be undertaken in the relevant context, as an impact can either be ecological or social, or both. The evaluation of the significance of an impact relies heavily on the values of the person making the judgment. For this reason, impacts of a social nature need to reflect the values of the affected society.

**Cumulative Impacts**

Cumulative impacts affect the significance ranking of an impact because the impact is taken in consideration of both onsite and offsite sources. For example, pollution making its way into a river from a development may be within acceptable national standards. Activities in the surrounding area may also create pollution which does not exceed these standards. However, if both onsite and offsite activities take place simultaneously, the total pollution level may exceed the standards. For this reason it is important to consider impacts in terms of their cumulative nature.

**Seasonality**

Although seasonality is not considered in the ranking of the significance, it may influence the evaluation during various times of the year. As seasonality will only influence certain impacts, it will only be considered for these, with management measures being imposed accordingly (i.e. dust suppression measures being implemented during the dry season).

**Table 2.2. Significance Rating Table.**

<b>Temporal Scale</b> (The duration of the impact)	
Short term	Less than 5 years (many construction phase impacts are of a short duration).
Medium term	Between 5 and 20 years.
Long term	Between 20 and 40 years (from a human perspective almost permanent).
Permanent	Over 40 years or resulting in a permanent and lasting change that will always be there.
<b>Spatial Scale</b> (The area in which any impact will have an affect)	
Individual	Impacts affect an individual.
Localised	Impacts affect a small area of a few hectares in extent. Often only a portion of the project area.
Project Level	Impacts affect the entire project area.

Surrounding Areas	Impacts that affect the area surrounding the development
Municipal	Impacts affect either the Local Municipality, or any towns within them.
Regional	Impacts affect the wider district municipality or the province as a whole.
National	Impacts affect the entire country.
International/Global	Impacts affect other countries or have a global influence.
Will definitely occur	Impacts will definitely occur.
<b>Degree of Confidence or Certainty</b> (The confidence with which one has predicted the significance of an impact)	
Definite	More than 90% sure of a particular fact. Should have substantial supportive data.
Probable	Over 70% sure of a particular fact, or of the likelihood of that impact occurring.
Possible	Only over 40% sure of a particular fact, or of the likelihood of an impact occurring.
Unsure	Less than 40% sure of a particular fact, or of the likelihood of an impact occurring.

**Table 2.3. Impact Severity Rating.**

<b>Overall Significance</b> (The combination of all the above criteria as an overall significance)	
VERY HIGH NEGATIVE	VERY BENEFICIAL
<p>These impacts would be considered by society as constituting a major and usually permanent change to the (natural and/or social) environment, and usually result in <b>severe</b> or <b>very severe</b> effects, or <b>beneficial</b> or <b>very beneficial</b> effects.</p> <p><b>Example:</b> The loss of a species would be viewed by informed society as being of VERY HIGH significance.</p> <p><b>Example:</b> The establishment of a large amount of infrastructure in a rural area, which previously had very few services, would be regarded by the affected parties as resulting in benefits with VERY HIGH significance.</p>	
HIGH NEGATIVE	BENEFICIAL
<p>These impacts will usually result in long term effects on the social and/or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light.</p> <p><b>Example:</b> The loss of a diverse vegetation type, which is fairly common elsewhere, would have a significance rating of HIGH over the long term, as the area could be rehabilitated.</p> <p><b>Example:</b> The change to soil conditions will impact the natural system, and the impact on affected parties (such as people growing crops in the soil) would be HIGH.</p>	
MODERATE NEGATIVE	SOME BENEFITS
<p>These impacts will usually result in medium to long term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by society as constituting a fairly important and usually medium term change to the (natural and/or social) environment. These impacts are real but not substantial.</p> <p><b>Example:</b> The loss of a sparse, open vegetation type of low diversity may be regarded as MODERATELY significant.</p>	
LOW NEGATIVE	FEW BENEFITS

These impacts will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by the public and/or the specialist as constituting a fairly unimportant and usually short term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect.

**Example:** The temporary changes in the water table of a wetland habitat, as these systems are adapted to fluctuating water levels.

**Example:** The increased earning potential of people employed as a result of a development would only result in benefits of LOW significance to people who live some distance away.

**NO SIGNIFICANCE**

There are no primary or secondary effects at all that are important to scientists or the public.

**Example:** A change to the geology of a particular formation may be regarded as severe from a geological perspective, but is of NO significance in the overall context.

**DON'T KNOW**

In certain cases it may not be possible to determine the significance of an impact. For example, the primary or secondary impacts on the social or natural environment given the available information.

**Example:** The effect of a particular development on people’s psychological perspective of the environment.

**2.9 Assumptions and Limitations**

This report is based on currently available information and, as a result, the following limitations and assumptions are implicit–

- The data analysed in this report is based on one site surveys of plant species. Therefore seasonal trends are not assessed. In addition, some plant species, with particular seasonal/short-lived flowering, may have gone undetected.
- A detailed faunal survey was not conducted. Opportunistic sightings/observations of animals occurring within the study site were recorded. This information, combined with an assessment of potential habitat to support faunal species, was used to determine the likelihood of the presence of animal species within the project area.

### 3 RELEVANT LEGISLATION

The proposed road upgrades and mining sites will be subject to the requirements of various items of South African Legislation. These are described below.

**Table 3.1: Environmental legislation considered in the preparation of the Ecological Impact Assessment for the proposed road upgrade.**

Title of Environmental legislation, policy or guideline	Implications for the upgrade of the National Route R63
Constitution Act (No. 108 of 1996)	Obligation to ensure that the proposed development will not result in pollution and ecological degradation; and Obligation to ensure that the proposed development is ecologically sustainable, while demonstrating economic and social development.
National Environmental Management Act (NEMA) (No. 107 of 1998)	The developer must apply the NEMA principles, the fair decision-making and conflict management procedures that are provided for in NEMA. The developer must apply the principles of Integrated Environmental Management and consider, investigate and assess the potential impact of existing and planned activities on the environment, socio-economic conditions and the cultural heritage.
National Environment Management: Biodiversity Act (No. 10 of 2004)	The proposed development must conserve endangered ecosystems and protect and promote biodiversity; Must assess the impacts of the proposed development on endangered ecosystems; No protected species may be removed or damaged without a permit; The proposed site must be cleared of alien vegetation using appropriate means.
National Water Act (No. 36 of 1998)	This Act provides details of measures intended to ensure the comprehensive protection of all water resources, including the water reserve and water quality. This proposed development will likely trigger the need for a water-use license according to Sections 21 (c) and (i) of the Act (See Aquatic Impact Assessment).
National Heritage Resource Act (25 of 1999)	Protection of natural and cultural heritage sites into the layout and operation of the project, where applicable. Ensuring compliance with both the South African Heritage Resources Agency (SAHRA) and the Eastern Cape Provincial Heritage Resources Agency (ECPHRA)

The following guidelines and documents are relevant to the project:

#### **Eastern Cape Province**

Eastern Cape Biodiversity Conservation Plan (2007)

The Eastern Cape Provincial Spatial Development Plan (November 2011)

The Provincial Growth and Development Plan (2004 - 2014)

The Provincial White Paper on Transport for Sustainable Development (2001)

The Rural Transport Plan Strategic Framework (2004)

## 4 DESCRIPTION OF THE ENVIRONMENT

The study sites and surrounding areas were described using a two-phased approach. Firstly, a desktop assessment of the site was conducted in terms of current vegetation classifications and biodiversity programmes and plans. This was followed by a site visit in order to assess the actual ecological state, current land-use, identify potential sensitive ecosystems and identify plant species located on the proposed project site.

### 4.1 Background and Literature review

Published literature on the ecology of the area was referenced in order to describe the study site in the context of the region and the Eastern Cape Province. The following documents/plans are referenced:

- SANBI vegetation (Mucina & Rutherford, 2006)
- Eastern Cape Biodiversity Conservation Plan (ECBCP)
- The National Freshwater Ecosystem Priority Areas (NFEPA)
- National Protected Areas Act (NO. 57 of 2003; NEMPAA) and the National Protected Areas Expansion Strategy (NPAES)
- Review of the SANBI Red Data List
- Convention on International Trade in Endangered Species (CITES),
- International Union for Conservation of Nature (IUCN),
- Provincial Nature Conservation Ordinance (PNCO),
- National Biodiversity Management: Biodiversity Act (NEMBA) List of Threatened or Protected Species,
- National Biodiversity Management: Biodiversity Act (NEMBA) List of Alien Invasive Vegetation
- Department of Agriculture, Forestry and Fisheries (DAFF) List of Protected Trees

#### 4.1.1 Climate

Fort Beaufort normally receives about 403mm of rain per year, with most rainfall occurring mainly during autumn. It receives the lowest rainfall (7mm) in July and the highest (66mm) in March. The average midday temperatures for Fort Beaufort range from 19.3°C in June to 28.3°C in January. The region is the coldest during July when temperatures drop to 5.6°C on average during the night.

#### 4.1.2 Topography, Geology and soils

The local region primarily consists of undulating plains to moderately steep sloped landscapes sometimes with shallow, incised drainage valleys. Figure 4.1 portrays the elevation profile of the National Route R63 from fort Beaufort to Alice. The average slope along the 69 km stretch is 3.5%. Figure 4.2 indicates the topography of the Fort Beaufort Alice area using 20 m contour lines. All 7 mining sites are located on flat to gently sloping plains.

Alternating mudstones and sandstones derived from the Adelaide Subgroup of the Karoo Supergroup of rocks are found onsite as well as Jurassic Dolerite dyke & sill intrusions (Geology South Africa II).

The substrate consists of primary loamy soils with clay-loams occurring closer to Fort Beaufort. Although Fa & Fc land types dominates, other land types like Db & Fb may occur.

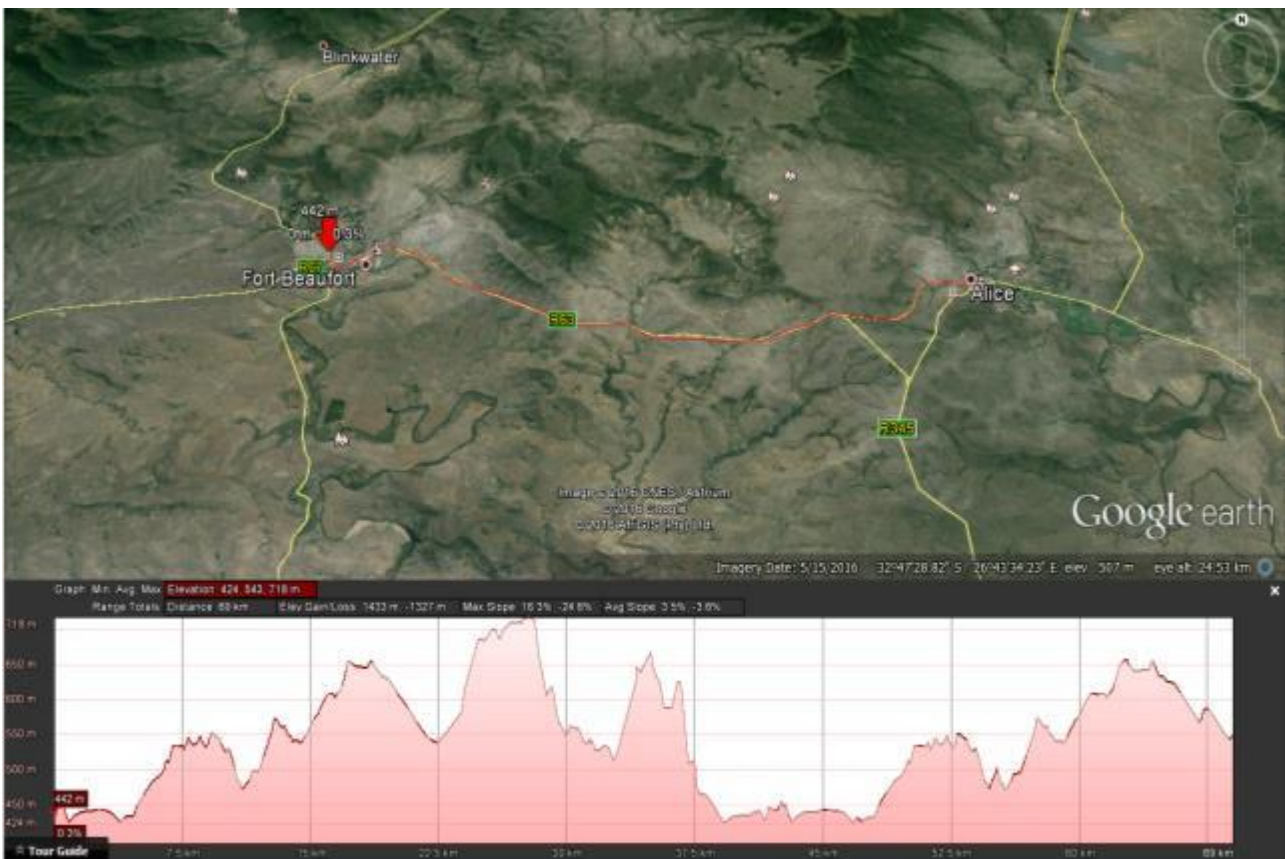


Figure 4.1: Elevation profile for the National Route R63 from Fort Beaufort to Alice.

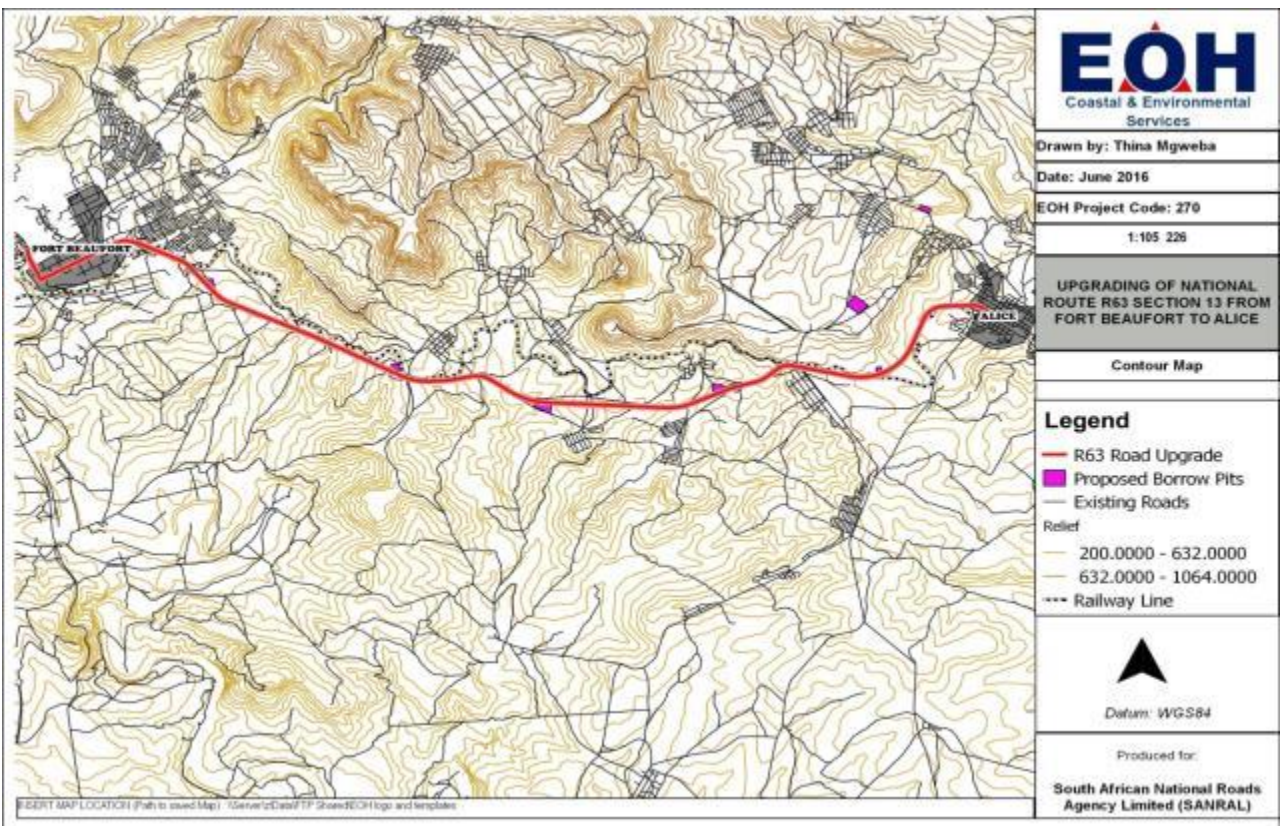


Figure 4.2: Contour Map of the R63 Section 13 Road Upgrade and borrow pit sites.

## 4.2 Vegetation and Floristics

### 4.2.1 SANBI classification (Mucina and Rutherford, 2006)

The following National & Provincial Plans are used to describe vegetation floristics that may potentially occur along the R63 road section:

- SANBI classification (Mucina and Rutherford, 2006)
- STEP classification
- DAFF Forestry classification

Two vegetation types are found along the R63 road section 13 namely:

- Bedford Dry Grassland
- Bhisho Thornveld

#### **Bedford Dry Grassland**

Bedford Dry Grassland vegetation is a sub-escarpment grassland type and forms part of the Grassland Biome.

This vegetation type is found on just east of Fort Beaufort (Figure 4.3) and is located on gently undulating plains that supports open, dry grassland interspersed with *Acacia karroo* woodland vegetation, especially along drainage lines. The grassland is relatively short (10-100cm in height) and is dominated by *Digitaria argyrograpta*, *Tragus koelerioides*, *Eragrostis curvula* and *Cymbopogon caesius*. It may also contain a dwarf shrubby component of karroid origin.

Mucina and Rutherford (2006) classify Bedford Dry Grassland as having a **LEAST THREATENED** Conservation Status. The NSBA Conservation Target for this vegetation type is 23%.

#### **Bhisho Thornveld**

Bhisho Thornveld vegetation is a sub-escarpment savanna type and forms part of the Savanna Biome.

Bhisho Thornveld is found on undulating to moderately steep slopes in large sections of the Eastern Cape Province. It is an open savanna characterised by small trees of *Acacia natalitia* with a short to medium, dense, sour grassy understorey, which is dominated by *Themeda triandra* when in good condition. A diversity of other woody species also occurs, often increasing under conditions of overgrazing.

Mucina and Rutherford (2006) classify the Bhisho Thornveld as **LEAST THREATENED**. The NSBA Conservation Target for this vegetation type is 25%.



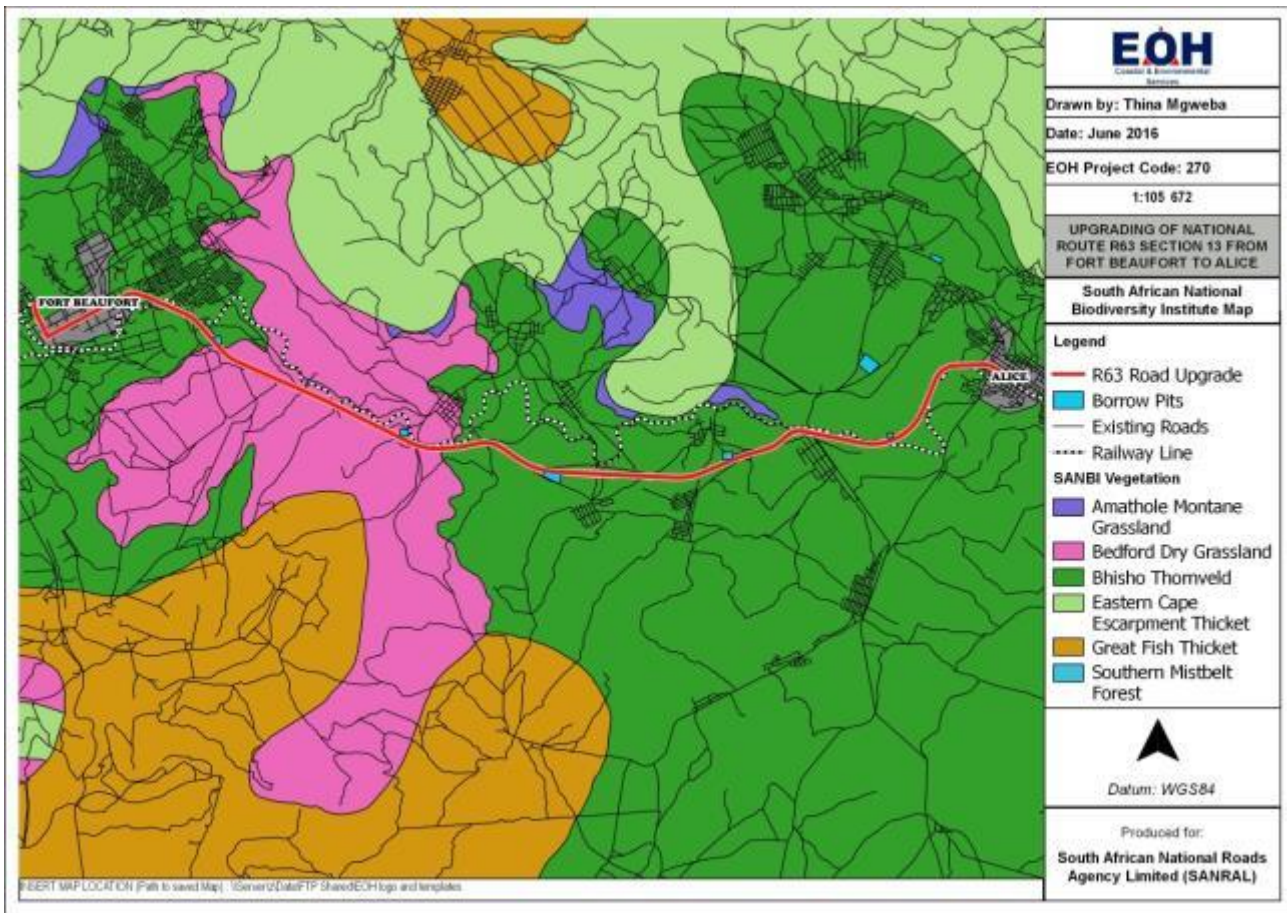


Figure 4.3: SANBI Vegetation Map of the R63 Section 13 Road Upgrade.

Only 1 mine site (BP07) is located on Bedford Dry Grassland vegetation while all other mine sites are found on Bhisho Thornveld.

**4.2.2 STEP Classification**

No thicket vegetation is found along the R63 Section 13 road.

**4.2.3 Forest classification**

No natural forest will be impacted by the proposed road development.

**4.3 Surface hydrology**

The National Route R63 from Fort Beaufort to Alice traverses numerous rivers, river tributaries and drainage lines as indicated in Figure 4.4 below. The road route also falls within numerous wetland buffers.



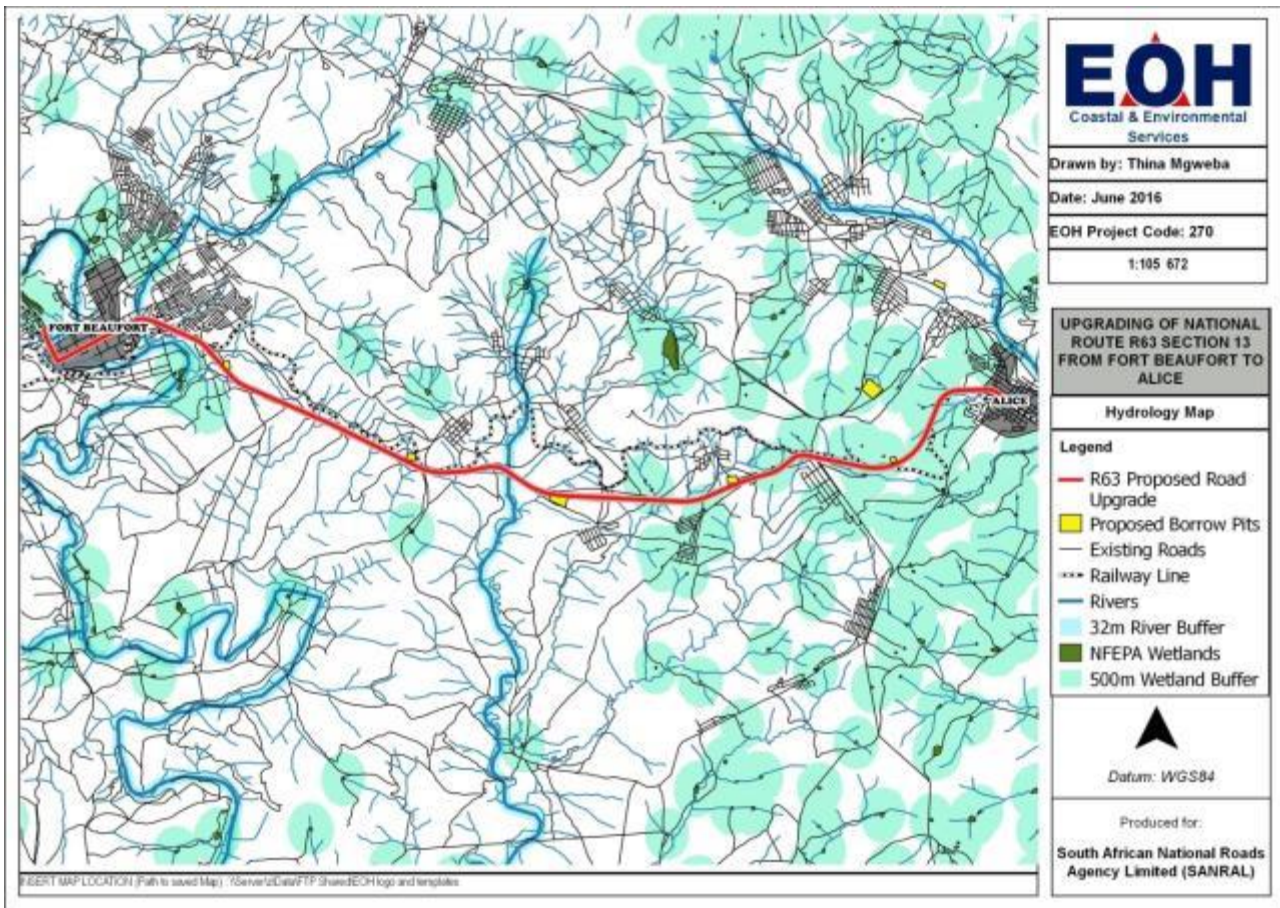


Figure 4.4: Hydrology Map of the R63 Section 13 Road Upgrade and borrow pit sites.

SANRAL identified twenty-three (23) water crossings along the proposed road upgrade route and EOH identified an additional eleven (11) possible water crossings. These ‘water crossings’ includes sections of the road that traverse or fall within the regulatory buffer of rivers, river tributaries, drainage lines and wetlands.

Three mine sites are all located within 50 meters of a river/stream/drainage system and will require a Water Use Licence (WUL) from the Department of Water & Sanitation (DWS) prior to commencement of any mining activity onsite. None of the other mine site is located within 50 meters of a water body.

None of the mine sites are located within 500m of a wetland.

#### 4.4 Land use

The current land uses in the vicinity of the R63 Section 13 road upgrade site are explained in Table 4.1 below and depicted in Figure 4.5 on the following page.

Table 4.1: The main land uses in the vicinity of the road upgrade.

Land Use Type	Color id in Figure 5.7	Affected by Road Upgrade (Yes/No/Maybe)	Mine site located in land use type
Cultivated land/agricultural land	Orange areas	Maybe	-
NFEPA Wetlands	Blue areas	Yes	-
High Urban Density (Towns of Fort Beaufort and Alice)	Grey areas	Yes	-
Existing Roads	Black lines	Yes	-
Rivers, tributaries and drainage lines	Blue lines	Yes	-
Existing Railway Track	Black and White lines	No	-



Land Use Type	Color id in Figure 5.7	Affected by Road Upgrade (Yes/No/Maybe)	Mine site located in land use type
Low Urban Density	Yellow areas	No	-
Woodland	Green areas	No	-
Orchard	Purple areas	No	-
Thicket and Bushland	Light beige	Yes	-
Degraded thicket and bushland	Light brown	Yes	-
Unimproved grassland	Light Green	No	BP01; BP08
Natural vegetation	No color	Yes	BP03; BP04; BP05; BP06; BP07

The current land uses that are likely to be impacted by the R63 Section 13 road upgrade are:

- Wetlands;
- Rivers;
- tributaries and drainage lines; and
- natural vegetation.

The land uses that are likely to be impacted by the mine sites are:

- Unimproved grassland
- Natural vegetation

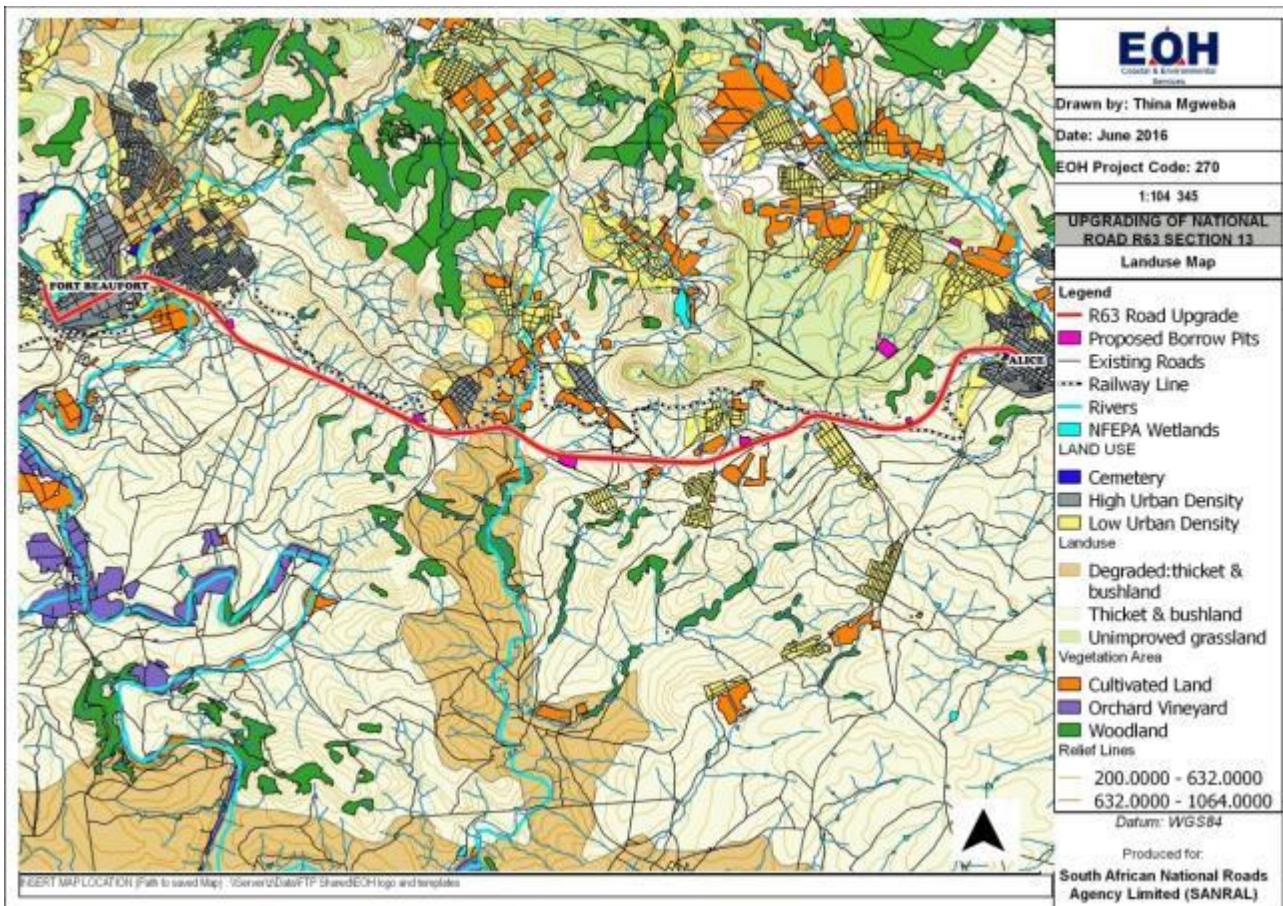


Figure 4.5: Land Use Map of the R63 Section 13 Road Upgrade.

## 4.5 Biodiversity Conservation

South Africa's policy and legislative framework for biodiversity is well developed, providing a strong basis for the conservation and sustainable use of biodiversity. South Africa is one of the few countries in the world to have a Biodiversity Act and a National Biodiversity Institute.

Key components of the national policy and legislative framework for biodiversity include:

- The White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity (1997)
- The National Environmental Management: Biodiversity Act (Act 10 of 2004)
- The National Environmental Management: Protected Areas Act (Act 57 of 2003)
- The National Biodiversity Strategy and Action Plan (NBSAP) (2005)
- The National Spatial Biodiversity Assessment (NSBA) (2004, currently being reviewed and updated)
- The National Biodiversity Framework (NBF) (2008)
- The National Protected Area Expansion Strategy (NPAES) (2008)

In addition to national legislation, some of South Africa's nine provinces have their own provincial biodiversity legislation, as nature conservation is a concurrent function of national and provincial government in terms of the Constitution (Act 108 of 1996). The relevant biodiversity plan in the Eastern Cape is the ECBCP (2007).

### 4.5.1 Protected Areas (NEMPAA & NPAES)

There are no known National, Provincial or locally protected areas found within the general study area.

### 4.5.2 Threatened or protected ecosystems (NEMBA)

There are no NEMBA (National list of ecosystems that are threatened and in need of protection; 2014) classified ecosystems found within the study area.

### 4.5.3 Eastern Cape Biodiversity Conservation Plan

The Eastern Cape Biodiversity Conservation Plan (ECBCP) attempts to map priorities areas for conservation in the province, as well as assigning land use categories depending on current conditions of unit areas and conservation targets that need to be achieved (Berliner *et al.* 2007). ECBCP, although mapped at a finer scale than the National Spatial Biodiversity Assessment is still, for the large part, inaccurate and “course” (Driver *et al.*, 2005). Therefore it is imperative that the status of the environment, for any proposed development MUST first be verified before the management recommendations associated with the ECBCP are considered (Berliner and Desmet, 2007).

The main outputs of the Eastern Cape Biodiversity Conservation Plan (ECBCP) are the identification of “critical biodiversity areas” or CBAs, which are allocated the following management categories:

**CBA 1** = Maintain in a natural state

**CBA 2** = Maintain in a near-natural state

A portion of the road upgrade close to Fort Beaufort (Figure 4.6) falls within areas that are classified as **CBA 2**.



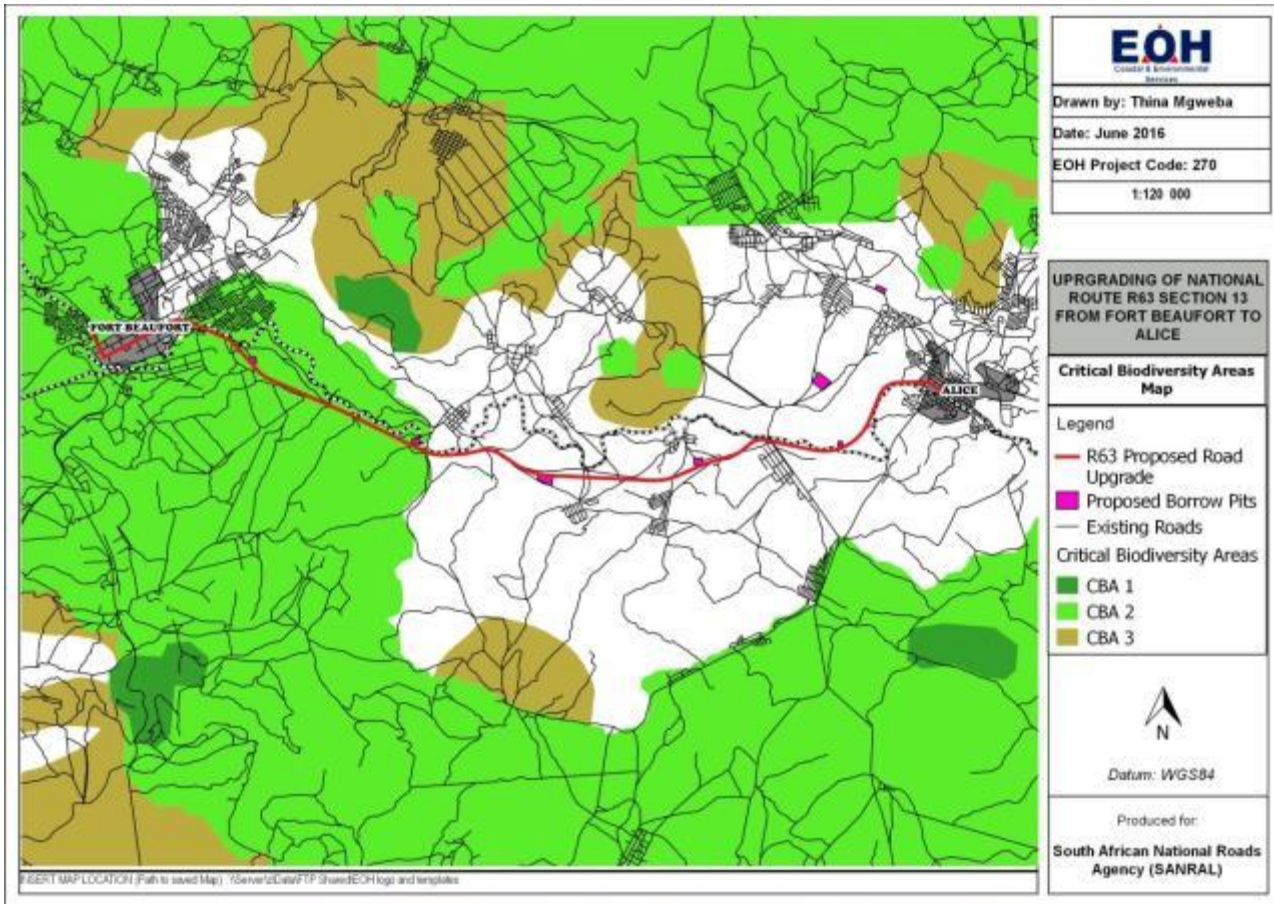


Figure 4.6: ECBCP CBA Map of the R63 Section 13 Road Upgrade and borrow pit sites.

**4.5.4 Conservation Status of plant species: Rare, or Threatened species**

The following is a list of potential plant species of conservation concern (SCC) derived from current literature for vegetation found in the area as well as the international IUCN Red Data List, the South African Red Data List, DAFF protected trees and the PNCO. The results are summarised in Table 4.2.

**Table 4.1: List of potential plant SCC that may be found onsite**

Family	Species	Common name	Threat status
AMARYLLIDACEAE	Brunsvigia gregaria R.A.Dyer	Candelbra Flower	Protected (PNCO)
AMARYLLIDACEAE	Cyrtanthus sanguineus (Lindl.) Walp. subsp. sanguineus	Kei Lily	Protected (PNCO)
AMARYLLIDACEAE	Cyrtanthus smithiae Watt ex Harv.		Protected (PNCO)
AMARYLLIDACEAE	Haemanthus albiflos Jacq.	Paint Brush	Protected (PNCO)
AMARYLLIDACEAE	Haemanthus humilis Jacq. subsp. humilis		Protected (PNCO)
AMARYLLIDACEAE	Nerine undulata (L.) Herb.	Nerine	Protected (PNCO)
AMARYLLIDACEAE	Scadoxus puniceus (L.) Friis & Nordal	Paintbrush Lily	Protected (PNCO)
APOCYNACEAE	Acokanthera oppositifolia (Lam.) Codd	Bushman’s Poison	Protected (PNCO)
APOCYNACEAE	Brachystelma circinatum E.Mey.	Bird-Cage Brachystelma	Protected (PNCO)
APOCYNACEAE	Carissa bispinosa (L.) Desf. ex	Num-Num	Protected (PNCO)

Ecological Impact Assessment – October 2016

Family	Species	Common name	Threat status
	Brenan		
APOCYNACEAE	Ceropegia bowkeri Harv. subsp. sororia (Harv. ex Hook.f.) R.A.Dyer		Protected (PNCO)
APOCYNACEAE	Ceropegia carnosia E.Mey.		Protected (PNCO)
APOCYNACEAE	Cynanchum ellipticum (Harv.) R.A.Dyer	Monkey Rope	Protected (PNCO)
APOCYNACEAE	Cynanchum gerrardii (Harv.) Liede	Milk-Rope	Protected (PNCO)
APOCYNACEAE	Marsdenia floribunda (E.Mey.) N.E.Br.	Madagascar Jasmine	Protected (PNCO)
APOCYNACEAE	Pachycarpus dealbatus E.Mey.		Protected (PNCO)
APOCYNACEAE	Pachypodium succulentum (Jacq.) Sweet	Dikvoet	Protected (PNCO); Protected (NEMBA)
APOCYNACEAE	Parapodium crispum N.E.Br.		Protected (PNCO)
APOCYNACEAE	Raphionacme zeyheri Harv.		Protected (PNCO)
APOCYNACEAE	Sarcostemma viminale (L.) R.Br. subsp. viminale	Caustic Bush	Protected (PNCO)
APOCYNACEAE	Schizoglossum linifolium Schltr. var. centrirostratum N.E.Br.		Protected (PNCO)
APOCYNACEAE	Strophanthus speciosus (Ward & Harv.) Reber	Forest Tailflower	Protected (PNCO)
APOCYNACEAE	Tylophora lycioides (E.Mey.) Decne.		Protected (PNCO)
ASPHODELACEAE	Aloe arborescens Mill.	Krantz Aloe	Protected (PNCO)
ASPHODELACEAE	Aloe pluridens Haw.	French Aloe	Protected (PNCO)
ASPHODELACEAE	Aloe tenuior Haw. var. tenuior	iKhalana (Xhosa)	Protected (PNCO)
ASPHODELACEAE	Haworthia attenuata (Haw.) Haw. var. attenuata	Zebra Plant	EN (Red Data List); Protected (PNCO)
ASPHODELACEAE	Haworthia bolusii Baker var. blackbeardiana (Poelln.) M.B.Bayer		Protected (PNCO)
ASPHODELACEAE	Haworthia cooperi Baker var. dielsiana (Poelln.) M.B.Bayer	Cooper's Haworthia	Protected (PNCO)
ASPHODELACEAE	Haworthia cooperi Baker var. pilifera (Baker) M.B.Bayer	Cooper's Haworthia	Protected (PNCO)
ASPHODELACEAE	Haworthia cymbiformis (Haw.) Duval var. cymbiformis	Cathedral Window Haworthia	Protected (PNCO)
ASPHODELACEAE	Haworthia cymbiformis (Haw.) Duval var. obtusa (Haw.) Baker		Protected (PNCO)
ASPHODELACEAE	Kniphofia linearifolia Baker	Common Marsh Poker	Protected (PNCO)
CRASSULACEAE	Crassula perfoliata L. var. perfoliata	Sekelblaarplakkie (Afrikaans)	Protected (PNCO)
DIOSCOREACEAE	Dioscorea sylvatica Eckl. var. sylvatica	Forest Elephant's Foot	VU (NEMBA)
EUPHORBIACEAE	Euphorbia bupleurifolia Jacq.		Declining (Red Data List);

**Ecological Impact Assessment – October 2016**

Family	Species	Common name	Threat status
			Protected (PNCO); Protected (NEMBA)
GERANIACEAE	<i>Pelargonium reniforme</i> Curtis subsp. <i>velutinum</i> (Eckl. & Zeyh.) Dreyer	Kidney-Leaved Pelargonium	Protected (NEMBA)
GERANIACEAE	<i>Pelargonium sidoides</i> DC.	Kalwerbossie	Protected (NEMBA)
IRIDACEAE	<i>Aristea schizolaena</i> Harv. ex Baker		Protected (PNCO)
IRIDACEAE	<i>Gladiolus dalenii</i> Van Geel subsp. <i>dalenii</i>	African gladiolus	Protected (PNCO)
IRIDACEAE	<i>Gladiolus guthriei</i> F.Bolus	Afrikaner	Protected (PNCO)
IRIDACEAE	<i>Gladiolus longicollis</i> Baker subsp. <i>longicollis</i>	Aandblom (Afrikaans)	Protected (PNCO)
IRIDACEAE	<i>Gladiolus mortonius</i> Herb.		Protected (PNCO)
IRIDACEAE	<i>Hesperantha bachmannii</i> Baker	Aandblom (Afrikaans)	Protected (PNCO)
IRIDACEAE	<i>Syringodea concolor</i> (Baker) M.P.de Vos		Protected (PNCO)
IRIDACEAE	<i>Tritonia gladiolaris</i> (Lam.) Goldblatt & J.C.Manning	Chiffon Lace	Protected (PNCO)
IRIDACEAE	<i>Tritonia laxifolia</i> (Klatt) Benth. ex Baker		Protected (PNCO)
MESEMBRYANTHEMACEAE	<i>Aptenia cordifolia</i> (L.f.) Schwantes	Baby Sun Rose	Protected (PNCO)
MESEMBRYANTHEMACEAE	<i>Drosanthemum hispidum</i> (L.) Schwantes	Miniature Pig Face	Protected (PNCO)
MESEMBRYANTHEMACEAE	<i>Mestoklema tuberosum</i> (L.) N.E.Br. ex Glen	Donkey Mesemb	Protected (PNCO)
MESEMBRYANTHEMACEAE	<i>Psilocaulon granulicaule</i> (Haw.) Schwantes	Match-Head Plant	Protected (PNCO)
ORCHIDACEAE	<i>Acrolophia cochlearis</i> (Lindl.) Schltr. & Bolus		Protected (PNCO)
ORCHIDACEAE	<i>Cyrtorchis arcuata</i> (Lindl.) Schltr. subsp. <i>arcuata</i>	Imfeyenkawu	Protected (PNCO)
ORCHIDACEAE	<i>Eulophia streptopetala</i> Lindl.	Amabelejongosi (Zulu)	Protected (PNCO)
ORCHIDACEAE	<i>Habenaria arenaria</i> Lindl.		Protected (PNCO)
ORCHIDACEAE	<i>Holothrix burchellii</i> (Lindl.) Rchb.f.	Tryphia	Protected (PNCO)
ORCHIDACEAE	<i>Mystacidium capense</i> (L.f.) Schltr.	Iphamba (Zulu)	Protected (PNCO)
ORCHIDACEAE	<i>Mystacidium gracile</i> Harv.		Protected (PNCO)
ORCHIDACEAE	<i>Polystachya ottoniana</i> Rchb.f.	Otto's Polystachya	Protected (PNCO)
PITTOSPORACEAE	<i>Pittosporum viridiflorum</i> Sims	Cheesewood	Protected (DAFF)
PORTULACACEAE	<i>Anacampseros arachnoides</i> (Haw.) Sims		Protected (PNCO)
SAPOTACEAE	<i>Sideroxylon inerme</i> L. subsp. <i>inerme</i>	White Milkwood	Protected (DAFF)
SCROPHULARIACEAE	<i>Diascia cuneata</i> E.Mey. ex Benth.		Protected (PNCO)
ZAMIACEAE	<i>Encephalartos trispinosus</i>	Bushman's River Cydad	VU (Red Data List);

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Ecological Impact Assessment – October 2016

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Family	Species	Common name	Threat status
	(Hook.) R.A.Dyer		Endangered (PNCO); VU (NEMBA)

## 5 SITE OBSERVATIONS AND DESCRIPTIONS

While National level vegetation maps have described broad vegetation types, local conditions and micro-habitats (rainfall, soil structure, rocky outcrops, etc.) can result in variations in plant composition. A site investigation was therefore conducted on the 6 July 2016 in order to confirm desktop findings, to assess the actual ecological state, current land-use, identify potential sensitive ecosystems and identify plant species located within the proposed project site. The site visit also served to inform potential impacts of the proposed project and how significantly it would impact on the surrounding ecological environment.

### 5.1 Vegetation types and description

Four distinct vegetation types were observed within and close to the proposed study site, namely:

- Bisho Thornveld
- Bedford Dry Grassland
- Riparian Vegetation; and
- Transformed Land

The vegetation types are described below.




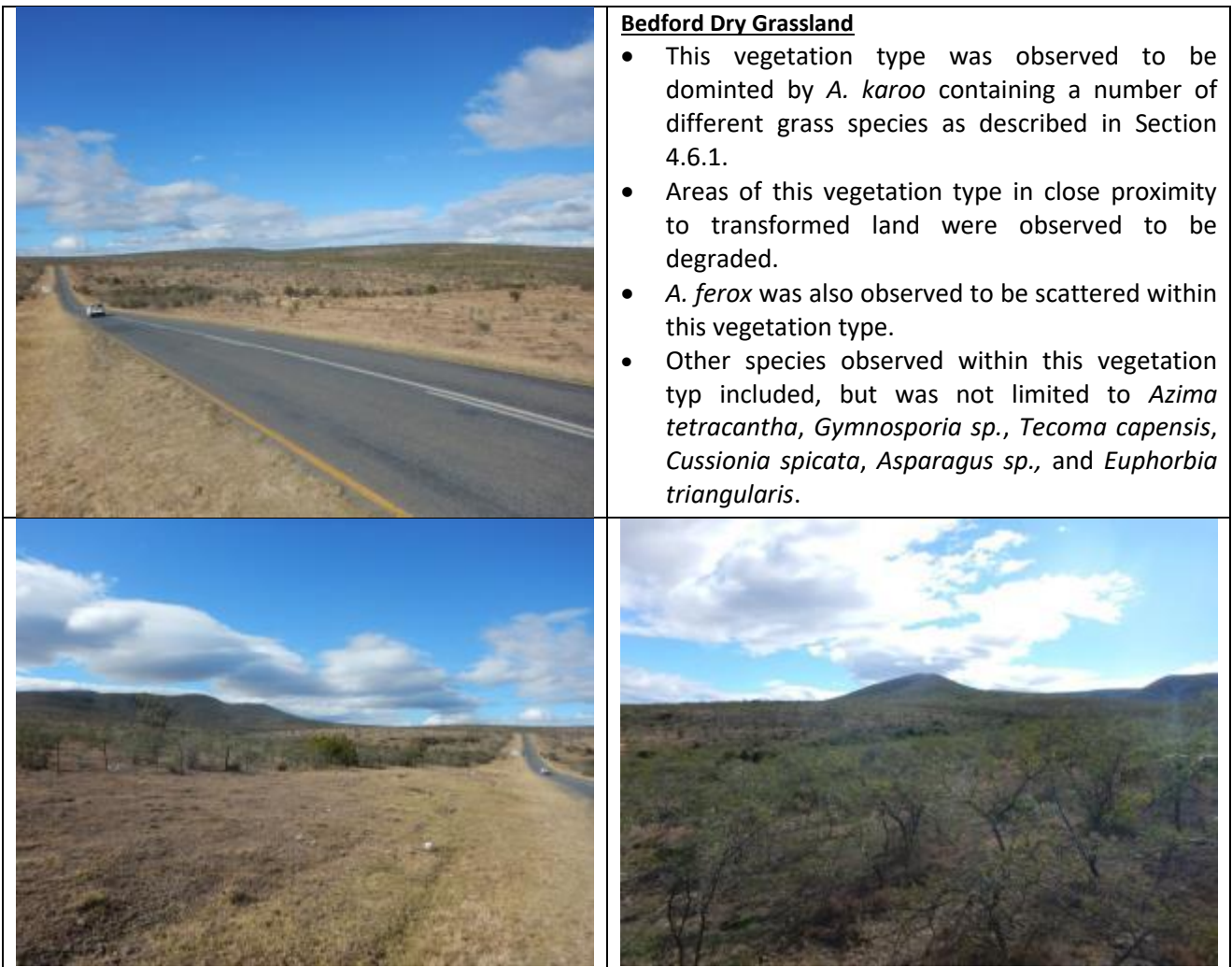
	<p><b>Bisho Thornveld</b></p> <ul style="list-style-type: none"> <li>• This vegetation type includes areas generally dominated with <i>Acacia natalitia</i> with a sour grassy understory.</li> <li>• A diversity of woody species are generally also present.</li> <li>• Species observed onsite included <i>Azima tetracantha</i>, <i>Gymnosporia sp.</i>, <i>Grewia occidentalis</i>, <i>Tarchonanthus camphoratus</i>, <i>Sersia sp.</i>, and <i>Aloe ferox</i>.</li> <li>• Some areas contained very little woody species diversity and were dominated by <i>Acacia natalitia</i>.</li> </ul>
	

Plate 5.1: Vegetation observed within the Bisho Thornveld Vegetation Type





**Bedford Dry Grassland**

- This vegetation type was observed to be dominated by *A. karoo* containing a number of different grass species as described in Section 4.6.1.
- Areas of this vegetation type in close proximity to transformed land were observed to be degraded.
- *A. ferox* was also observed to be scattered within this vegetation type.
- Other species observed within this vegetation type included, but was not limited to *Azima tetraantha*, *Gymnosporia sp.*, *Tecoma capensis*, *Cussonia spicata*, *Asparagus sp.*, and *Euphorbia triangularis*.

Plate 5.2: Vegetation observed within the Bedford Dry Grassland Vegetation Type



**Transformed Land**

- Transformed land in this instance includes all land that has been transformed by human activities.
- Transformed land within the study area was made up of vegetation that had been planted in urban areas.
- A range of alien vegetation was observed within this vegetation type including, but not limited to *Jacaranda mimisifolia*, *Grevilea robusta*, *Pinus spp.*, *Eucalyptus sp.* and *Ligustrum lucidum*.
- *A. ferox* was also observed to be scattered within this vegetation type.
- Indigenous trees that were observed lining the streets of urban areas included *Sersia pendulina* and *Erythrina caffra*.



Plate 5.3: Vegetation observed within the Transformed Land Vegetation Type



**Riparian Vegetation**

- Numerous drainage lines, watercourses and wetlands were observed surrounding the proposed study site.
- Riparian vegetation was found in very few of these aquatic environments.
- The majority of the wetlands were identified as artificial and contained no riparian vegetation.
- A number of alien vegetation species were observed within this vegetation type, especially riparian vegetation that occurs within the transformed land vegetation type.
- For details of the riparian vegetation of the site and aquatic environments please refer to the Aquatic Impact Assessment.



Plate 5.4: Vegetation observed within the Riparian Vegetation Type

Figure 5.1 below illustrates the different vegetation types observed onsite.



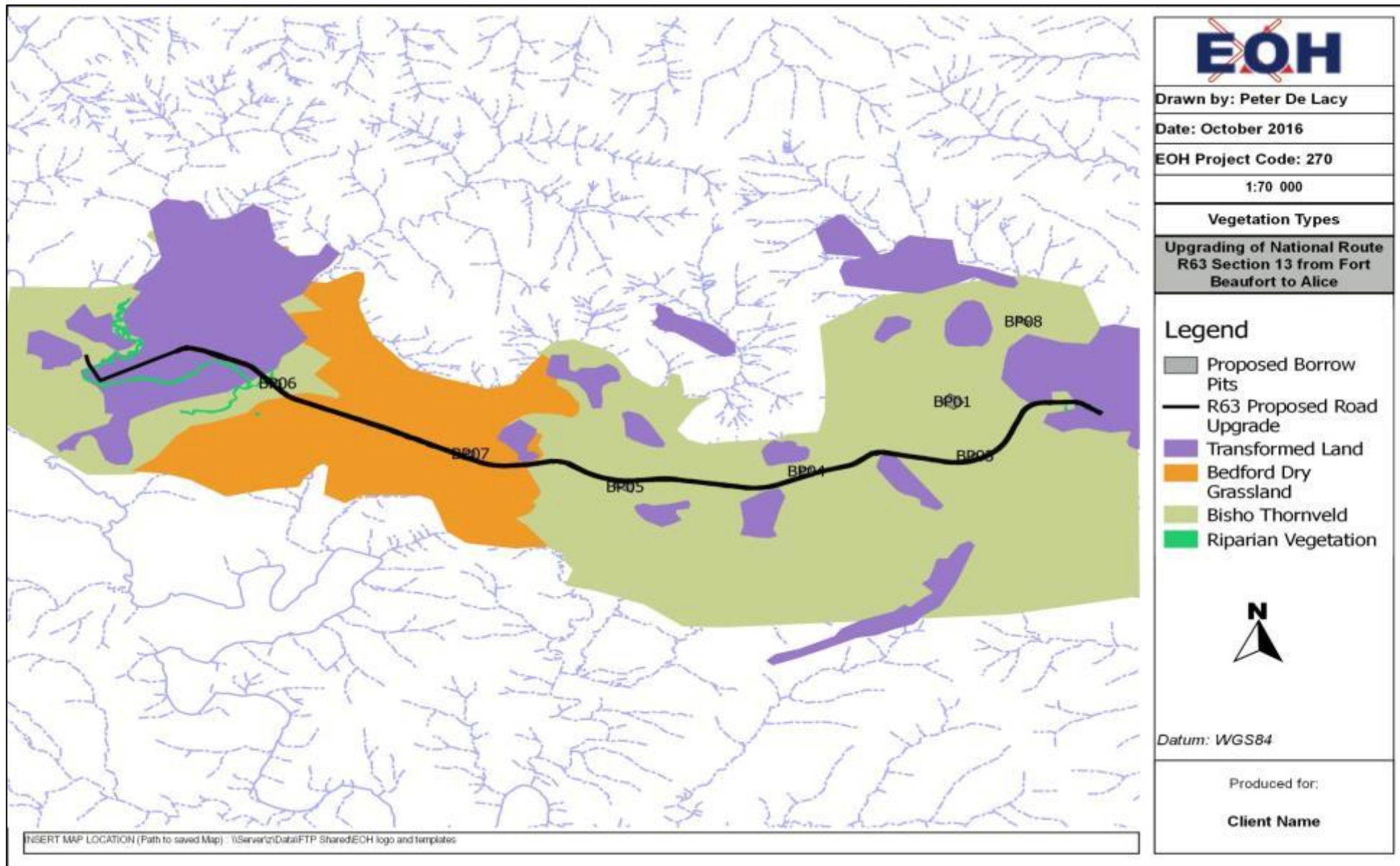


Figure 5.1: Vegetation types observed onsite.

## 5.2 Plant Species Observed

A number of species were identified to potentially occur within and surrounding the study area (Appendix 1). Of the species identified, 64 are listed as potential species of conservation concern (Table 4.1). These species are all either schedule 2 & 3 species on the Provincial Nature Conservation Ordinance Act 19 of 1974, species protected by NEMBA or are protected tree species under the National Forest Act, 1998 (Act No. 84 of 1998).

## 5.3 Alien Invasive Species

Below is a list of all alien invasive plant species identified within the study site. These plants are classified according to the Conservation of Agricultural Resources Act (Act No. 43 of 1983 or CARA) and the National Environmental Management: Biodiversity Act (Act No. 10 of 2004): Alien and Invasive Species List, 2014. The CARA alien invasive list is only referenced where an alien invasive species that does not appear on the NEMBA list appears on the CARA list.

According to NEMBA Category 1b species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be contained. A landowner upon whose land a Category 1b Listed Invasive Species occurs and which species is under the landowner's control must:

- Comply with the provisions of section 73(2) of the Act; and
- Contain the Listed Invasive Species in compliance with section 75(1), (2) and (3) of the Act;

If an Invasive Species Management Programme has been developed in terms of regulation 7, a landowner must control the Listed Invasive Species in accordance with such programme. A landowner contemplated in sub-regulation (2) must allow an authorised official from the Department to enter onto the land to monitor, assist with or implement the containment of the Listed Invasive Species, or compliance with the Invasive Species Management Programme contemplated in regulation 7.

For Category 2 NEMBA requires that a Permit is required if growing, breeding or in any other way propagating any specimen.

**Table 5.2: List of all alien invasive plant species identified.**

Plant name	Common name	CARA classification status	NEMBA: Alien and Invasive Classification
<i>Grevillea robusta</i>	Australian Silver Oak		Category 3
<i>Jacaranda mimosifolia</i>	Jacaranda	Invader Category 3	
<i>Ligustrum lucidum</i>	Chinese Privet		1b
<i>Melia azedarach</i>	Syringa		1b
<i>Opuntia ficus-indica</i>	Prickly Pear		1b
<i>Solanum mauritianum</i>	Bugweed		1b

## 5.4 Animal species

No amphibians, reptiles, terrestrial invertebrates, birds and nesting areas or large mammals were observed onsite. Small mammals such as rodents, ground squirrels, bats and a variety of insects, amphibians and reptiles are expected to occur on site. There might be some protected animal species associated with the river areas.

## 6 SITE SENSITIVITY

In terms of Appendix 6 of the EIA Regulations (2014) a specialist report must contain-

- (f) the specific identified sensitivity of the site related to the activity and its associated structures and infrastructure;
- (g) an identification of any areas to be avoided, including buffers;
- (h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;

### 6.1 Conservation and Spatial Planning Tools

One conservation planning tool is available for the study area. This tool allows for the potential identification of any sensitive and important areas from a vegetation perspective at the early stage of a development and allow for the fine tuning of plans and infrastructure layouts.

The following tools were identified and are discussed below:

- ECBCP Critical Biodiversity Areas

These tools together with the field survey have been used to assess the sensitivity of the study area. Sensitivity of the study area as well as the surrounding environment is shown on a sensitivity map (Figure 6.1 below).

#### 6.1.1 ECBCP Critical Biodiversity Areas

ECBCP has classified a portion of the study site as CBA 2 (Figure 4.6). ECBCP states that CBA 2 areas must be maintained in a near-natural state. The site observations showed that these areas were in fact not pristine and due to the status of the vegetation, these areas have been given a **moderate sensitivity** (Figure 6.1).

### 6.2 Vegetation

Due to the status of the vegetation types observed onsite (Bedford Dry Grassland and Bisho Thornveld) being "**Least Threatened**", these areas have been given **low sensitivity** (Figure 6.1).

All riparian vegetation identified onsite is classified as **high sensitivity** (Figure 6.1). The vegetation type considered transformed has been allocated **low sensitivity** (Figure 6.1).

All sensitive aquatic ecosystems have been described and discussed in the Aquatic Impact Assessment.

### 6.3 Sensitivity map

A sensitivity map was developed based on the allocations made in Sections 6.1 – 6.2 for the entire study area (Figure 6.1).

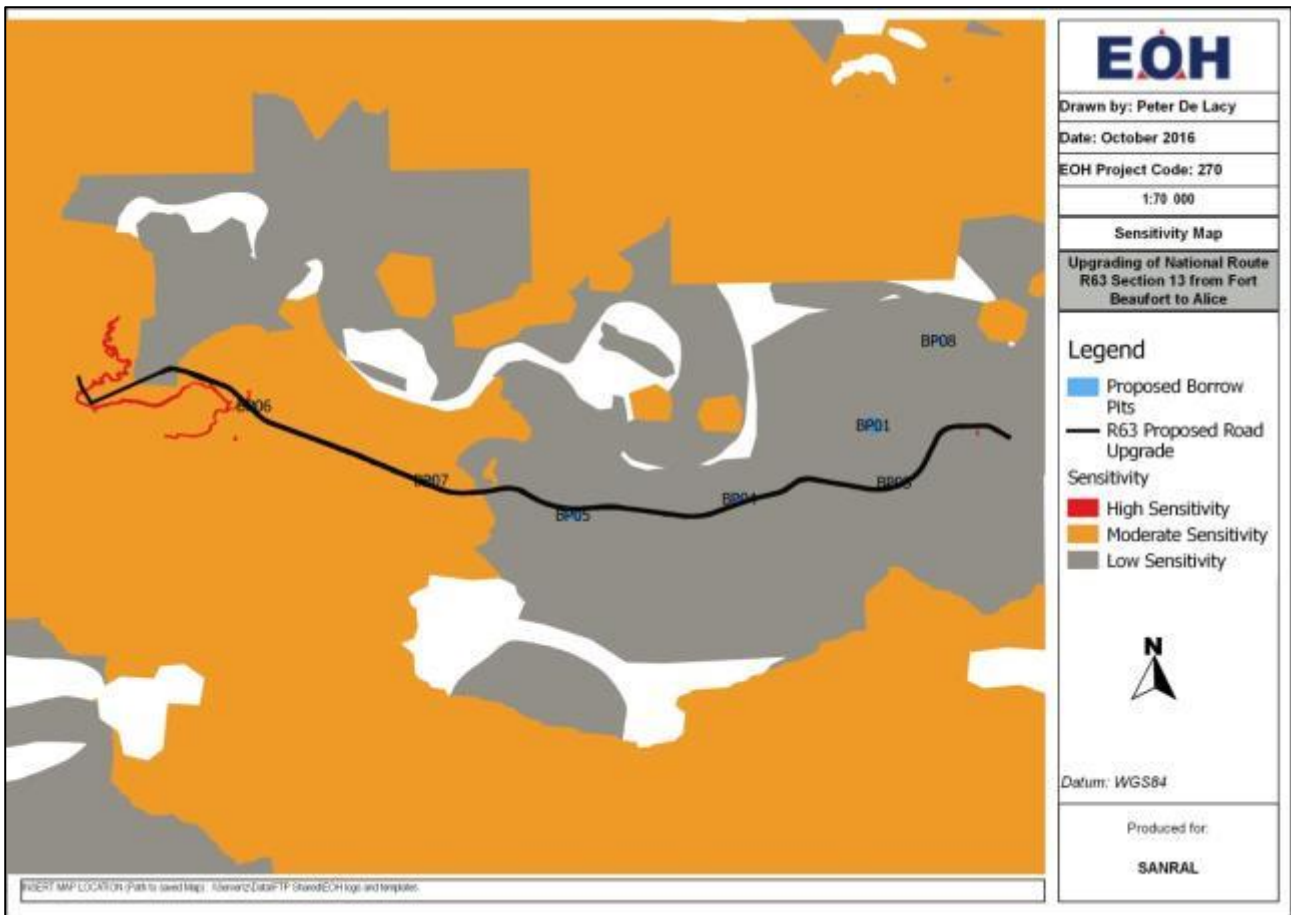


Figure 6.1. Sensitivity map of the R63 Section 13 Road Upgrade and borrow pit sites.

#### 6.4 Issues identified

The following issues were identified during the sensitivity assessment of the proposed project.

Table 6.1. Issues identified during the sensitivity assessment of the proposed study site and the different phases of development.

MIND MAP: Ecological Impact for the proposed road upgrade				
THEMES	CATEGORIES	PLANNING & DESIGN PHASE	CONSTRUCTION PHASE	OPERATIONAL PHASE
Ecological Environments	Legal and policy compliance	X		
	Material stockpiling		X	
	Stormwater management and erosion	X	X	X
	Riparian vegetation		X	
	Loss of natural vegetation	X	X	X
	Loss of SCC	X	X	X
	Invasion of alien species	X	X	X
	Rehabilitation of disturbed areas			X

## 7 MANNER IN WHICH THE ENVIRONMENT MAY BE AFFECTED

In terms of Appendix 6 of the EIA Regulations (2014) a specialist report must contain-

- (j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment;
- (k) any mitigation measures for inclusion in the EMPr;

### 7.1 Impacts identified

Ecological impacts that were identified during the Planning and Design, Construction, Operational of the proposed Lambasi Feedlot are indicated in Table 7.1. These included the consideration of direct, indirect and cumulative impacts that may occur.

**Table 7.1. Impacts identified during the phases of the proposed road upgrade.**

Categories	Applicability to each phase		
	Planning and Design	Construction	Operation
<b>Legal and policy compliance</b>	YES  Non-compliance with the laws and policies of South Africa as they pertain to the ecological environment.	N/A	N/A
<b>Material stockpiling</b>	N/A	YES  Stockpiling of construction material within 32 m of a watercourse or within any identified sensitive environment.	N/A
<b>Stormwater management and erosion</b>	YES  Inappropriate design of stormwater structures.	YES  Inappropriate routing of stormwater.	YES  Inappropriate routing of stormwater.
<b>Riparian vegetation</b>	N/A	YES  Inappropriate removal of riparian vegetation.	YES  Road maintenance may lead to the loss of riparian vegetation.
<b>Loss of natural vegetation</b>	Yes  The inappropriate design of project infrastructure.	Yes  Clearing of natural vegetation for site camps and infrastructure will lead to the loss of natural vegetation.	Yes  Road maintenance may lead to the loss of natural vegetation.
<b>Loss of SCC</b>	Yes  The inappropriate design of project infrastructure.	Yes  Clearing of natural vegetation for site camps and infrastructure will lead to the loss of identified and unidentified plant SCC.	Yes  Road maintenance may lead to the loss of identified and unidentified plan SCC.
<b>Invasion of alien species</b>	YES	YES	YES

Categories	Applicability to each phase		
	Planning and Design	Construction	Operation
	Failure to plan for the removal and management of alien vegetation	Removal of existing natural vegetation resulting in invasion by alien species.	Lack of effective alien management plan resulting in invasion by alien species.
<b>Rehabilitation of disturbed areas</b>	N/A	YES  Poor rehabilitation throughout construction may lead to the degradation of ecosystems.	N/A

## 7.2 Impact assessment

The impacts identified in Section 7.1 are assessed in terms of the criteria described in Section 2.4.7 and are summarised in the tables below (Table 7.2 – 7.5).



Table 7.2. Assessment and mitigation of impacts during all phases of the development.

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE (EXTENT)	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY / BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
<b>PLANNING &amp; DESIGN PHASE</b>									
<i>ECOLOGICAL IMPACT ASSESSMENT</i>									
<b>Legal and policy compliance</b>	During the planning and design phase non-compliance with the laws and policies of South Africa as they pertain to the ecological environment could lead to damage of the ecological environment, unnecessary delays in construction activities, and potentially criminal cases, based on the severity of the non-compliance, being brought against the proponent and his/her contractors.	<b>Direct, Cumulative</b>	<b>Localised</b>	<b>Short-term</b>	<b>Probable</b>	<b>Moderately severe</b>	<b>Moderate Negative</b>	<ul style="list-style-type: none"> <li>All legal matters pertaining to permitting must be completed prior to any construction activity.</li> <li>In particular, all necessary Water Use Licences must be in order for construction activities within 32 metres of a watercourse and within 500 m of a wetland.</li> <li>The relevant permits must be obtained from the competent authority in order to remove any protected plant species.</li> </ul>	<b>Low Negative</b>
<b>Stormwater management and erosion</b>	During the planning and design phase the inappropriate design of stormwater structures may result in increased levels of erosion, sedimentation and pollution of the watercourses.	<b>Direct</b>	<b>Localised</b>	<b>Long-term</b>	<b>Possible</b>	<b>Severe</b>	<b>High Negative</b>	<ul style="list-style-type: none"> <li>Appropriate stormwater structures must be designed to minimise erosion and sedimentation of watercourses.</li> <li>All infrastructure situated on slopes must incorporate stormwater diversion.</li> <li>Flood attenuation and stormwater management plans must be drawn up by a qualified engineer and approved by DEDEAT, the ECO and DWS.</li> <li>Stormwater design must be in line with DWS requirements.</li> </ul>	<b>Moderate Negative</b>
<b>Loss of natural vegetation</b>	During the planning and design phase the inappropriate design of the project infrastructure will lead to the unnecessary loss of natural vegetation.	<b>Direct, indirect, cumulative</b>	<b>Localised</b>	<b>Permanent</b>	<b>Definite</b>	<b>Moderately severe</b>	<b>Low Negative</b>	<ul style="list-style-type: none"> <li>The layout of the project infrastructure must have as minimal impact on the natural vegetation as possible.</li> </ul>	<b>Low Negative</b>
<b>Loss of SCC</b>	During the planning and design phase the inappropriate design of the project infrastructure will lead to the unnecessary loss of SCC.	<b>Direct</b>	<b>Localised</b>	<b>Permanent</b>	<b>Probable</b>	<b>Moderately severe</b>	<b>Moderate Negative</b>	<ul style="list-style-type: none"> <li>All plant SCC must be relocated to outside the construction footprint prior to commencement of activities.</li> <li>The relevant permits must be obtained from the competent authority in order to remove any SCC.</li> </ul>	<b>Low Negative</b>
<b>Invasion of alien plant species</b>	During the planning and design phase the failure to plan for the removal and management of alien vegetation could result in the invasion of alien vegetation during the construction and operation phase.	<b>Indirect</b>	<b>Project Level</b>	<b>Medium-term</b>	<b>Probable</b>	<b>Moderately severe</b>	<b>Moderate Negative</b>	<ul style="list-style-type: none"> <li>A Rehabilitation and Alien Vegetation Management Plan must be designed to reduce the establishment and spread of undesirable alien plant species.</li> </ul>	<b>Low Negative</b>
<b>CONSTRUCTION PHASE</b>									
<b>Material stockpiling</b>	During the construction phase stockpiling of materials within 50 m of a watercourse could result in erosion and mobilisation of the materials into the nearby watercourse, resulting in sedimentation and a decrease in water quality and aquatic habitat.	<b>Direct, Indirect, Cumulative</b>	<b>Localised</b>	<b>Short-term</b>	<b>Possible</b>	<b>Moderately severe</b>	<b>Moderate Negative</b>	<ul style="list-style-type: none"> <li>No construction material must be stored within 50 m of a watercourse.</li> <li>Stockpiles within 100 m of a watercourse must be monitored for erosion and mobilisation of materials towards watercourses. If this is noted by an ECO, suitable cut-off drains or berms must be placed between the stockpile area and the nearest watercourse.</li> </ul>	<b>Low Negative</b>
<b>Stormwater management and erosion</b>	During the construction phase the inappropriate routing of stormwater will lead to stream sedimentation and erosion of the surrounding	<b>Direct</b>	<b>Localised</b>	<b>Short-term</b>	<b>Probable</b>	<b>Moderately severe</b>	<b>Moderate Negative</b>	<ul style="list-style-type: none"> <li>Flood attenuation and stormwater management plans must be drawn up by a qualified engineer and approved by DWS.</li> <li>An Erosion and Sediment Management Plan</li> </ul>	<b>Low Negative</b>

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE (EXTENT)	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY / BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	environment.							must be developed to minimise the ingress of sediment-laden stormwater into rivers/wetlands and minimise erosion of the surrounding environment.	
<b>Riparian vegetation</b>	During the construction phase the inappropriate removal of sensitive riparian vegetation will adversely affect identified sensitive environments.	<b>Direct</b>	<b>Study site</b>	<b>Medium-term</b>	<b>Possible</b>	<b>Moderately severe</b>	<b>Moderate Negative</b>	<ul style="list-style-type: none"> <li>Removal of riparian vegetation must take place under the supervision of the ECO.</li> <li>A rehabilitation and Alien Vegetation Management Plan must be developed and implemented during construction.</li> <li>Vehicles and machinery must not encroach into sensitive areas outside the proposed road upgrade footprint.</li> </ul>	<b>Low Negative</b>
<b>Loss of natural vegetation</b>	During the construction phase the clearing of natural vegetation for construction will lead to the loss of natural vegetation.	<b>Direct, Indirect, Cumulative</b>	<b>Localised</b>	<b>Medium-term</b>	<b>Possible</b>	<b>Moderately severe</b>	<b>Moderate Negative</b>	<ul style="list-style-type: none"> <li>The construction footprint must be surveyed and demarcated prior to construction commencing to ensure that there is no unnecessary loss of natural vegetation outside the approved road upgrade footprint.</li> <li>Where vegetation has been cleared, site rehabilitation in terms of soil stabilisation and revegetation must be undertaken.</li> </ul>	<b>Low Negative</b>
<b>Loss of SCC</b>	During the construction phase the clearing of natural vegetation may lead to the destruction of habitats and the loss of identified and unidentified plant SCC.	<b>Direct, Indirect, Cumulative</b>	<b>Study Site</b>	<b>Medium-term</b>	<b>Probably</b>	<b>Moderately severe</b>	<b>Moderate Negative</b>	<ul style="list-style-type: none"> <li>All areas that will be impacted must be surveyed by a suitably qualified botanist/ecologist prior to topsoil removal in order to locate and rescue any SCC within the area and relocate them.</li> <li>No SCC must be removed from site. All SCC must be relocated immediately outside of the construction and operational footprint.</li> <li>Search and rescue must be undertaken by a professional and qualified botanist.</li> <li>The contractor's staff must not poach or trap wild animals.</li> <li>The contractor's staff must not harvest any natural vegetation.</li> </ul>	<b>Low Negative</b>
<b>Invasion of alien plant species</b>	During the construction phase the removal of natural vegetation (including riparian vegetation) creates 'open' habitats that will favour the establishment of undesirable alien plant species in areas that are typically very difficult to eradicate and may pose a threat to neighbouring natural ecosystems.	<b>Indirect</b>	<b>Study Site</b>	<b>Long-term</b>	<b>Probable</b>	<b>Moderately severe</b>	<b>Moderate Negative</b>	<ul style="list-style-type: none"> <li>An Alien Management Plan must be developed and implemented during the construction phase to reduce the establishment and spread of undesirable alien plant species.</li> <li>Alien plants must be removed from the site through appropriate methods such as hand pulling, application of chemicals, cutting, etc.</li> </ul>	<b>Low Negative</b>
<b>Rehabilitation of disturbed areas</b>	During the construction phase poor continuous rehabilitation of disturbed areas may lead to the permanent degradation of ecosystems as well as allow alien vegetation species to expand.	<b>Direct, Indirect, Cumulative</b>	<b>Localised</b>	<b>Long-term</b>	<b>Probable</b>	<b>Moderately severe</b>	<b>Moderate Negative</b>	<ul style="list-style-type: none"> <li>All temporarily impacted areas must be rehabilitated back to their original condition.</li> <li>Only topsoil from the immediate area must be used for rehabilitation.</li> <li>All temporarily impacted areas must be restored as per the Rehabilitation Management Plan.</li> </ul>	<b>Low Negative</b>
<b>OPERATIONAL PHASE</b>									
<b>Stormwater Management</b>	During the operational phase the inappropriate routing of stormwater will lead to stream sedimentation.	<b>Direct</b>	<b>Study Site</b>	<b>Long-term</b>	<b>Probable</b>	<b>Severe</b>	<b>High Negative</b>	<ul style="list-style-type: none"> <li>Flood attenuation and stormwater management plans drawn up by a qualified engineer and approved by DEDEAT and DWS must be monitored to ensure rivers and wetlands do not have changes in sediment</li> </ul>	<b>Low Negative</b>

ISSUE	DESCRIPTION OF IMPACT	NATURE OF IMPACT	SPATIAL SCALE (EXTENT)	TEMPORAL SCALE (DURATION)	CERTAINTY SCALE (LIKELIHOOD)	SEVERITY / BENEFICIAL SCALE	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
								<p>levels caused by the ingress of sediment-laden stormwater.</p> <ul style="list-style-type: none"> <li>An Erosion and Sediment Management Plan must be must be monitored to ensure rivers and wetlands do not have changes in sediment levels caused by the ingress of sediment-laden stormwater.</li> </ul>	
<b>Loss of natural vegetation</b>	During the operational phase the clearance of vegetation for maintenance purposes may lead to the unnecessary loss of natural vegetation.	<b>Direct</b>	<b>Study Site</b>	<b>Long-term</b>	<b>Possible</b>	<b>Moderately Severe</b>	<b>Moderate Negative</b>	<ul style="list-style-type: none"> <li>All road maintenance activities must be limited to the road reserve.</li> <li>No activities must occur outside the road reserve without prior approval.</li> </ul>	<b>Low Negative</b>
<b>Loss of SCC</b>	During the operational phase the clearance of vegetation for maintenance purposes may lead to the unnecessary loss of identified and unidentified plant SCC.	<b>Direct</b>	<b>Study Site</b>	<b>Long-term</b>	<b>Possible</b>	<b>Moderately Severe</b>	<b>Moderate Negative</b>	<ul style="list-style-type: none"> <li>All road maintenance activities must be limited to the road reserve.</li> <li>No activities must occur outside the road reserve without prior approval.</li> <li>The relevant permits must be obtained from the competent authority in order to remove any SCC should this be required.</li> </ul>	<b>Low Negative</b>
<b>Invasion of Alien Species</b>	During the operational phase the lack of an effective alien vegetation management plan may lead to the large scale alien plant invasion.	<b>Direct, Indirect, Cumulative</b>	<b>Study Site</b>	<b>Long-Term</b>	<b>Possible</b>	<b>Moderately Severe</b>	<b>Moderate Negative</b>	<ul style="list-style-type: none"> <li>An Alien Vegetation Management Plan must be implemented during the operational phase to reduce the establishment and spread of undesirable alien plant species.</li> <li>Alien plants must be removed through appropriate methods such as hand pulling, application of chemicals, cutting, etc. as in accordance to the NEMBA: Alien Invasive Species Regulations.</li> </ul>	<b>Low Negative</b>

## 8 IMPACT STATEMENT, CONCLUSION AND RECOMMENDATIONS

In terms of Appendix 6 of the EIA Regulations (2014) a specialist report must contain-

- (l) any conditions for inclusion in the environmental authorisation;
- (m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;
- (n) a reasoned opinion-
  - (i) as to whether the proposed activity or portions thereof should be authorised; and
  - (ii) if the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;

### 8.1 Conclusions

The following table summarises the change in impacts from pre- to post- mitigation for the proposed road upgrade.

**Table 8.1. Assessment of pre- and post-mitigation impact significance.**

	PRE-MITIGATION				POST-MITIGATION			
	LOW	MODERATE	HIGH	UN-KNOWN	LOW	MODERATE	HIGH	UN-KNOWN
Planning and Design	0	4	1	0	4	1	0	0
Construction	0	7	0	0	7	0	0	0
Operational	0	4	0	0	4	0	0	0
<b>TOTAL</b>	<b>0</b>	<b>15</b>	<b>1</b>	<b>0</b>	<b>15</b>	<b>1</b>	<b>0</b>	<b>0</b>

### 8.2 Current status

The vegetation on the study site is mostly intact but not pristine around urban areas. Some SCC were observed onsite and will require permits before they can be removed.

### 8.3 Recommendations

All riparian vegetation is classified as “*high sensitivity*” (coloured red in Figure 6.1) due to their association with waterbodies (drainage systems & wetlands) and their ecological importance to these waterbodies.

Areas identified as CBA 2 by ECBCP have been given the “*moderate sensitivity*” classification. Other areas have been given “*low sensitivity*” due to the status of the vegetation types observed onsite. These areas may have both plant and animal SCC present. The relevant permits must be applied for as a precaution.

All the mitigation measures provided below are to be implemented in the Planning and Design, Construction and Operational Phases for the proposed road upgrade.

#### 8.3.1 Planning and Design Phase

The following conditions associated with Planning and Design Phase must be implemented:

#### Legal and Policy Compliance

- All legal matters pertaining to permitting must be completed prior to any construction activity.

- In particular, all necessary Water Use Licences must be in order for construction activities within 32 metres of a watercourse and within 500 m of a wetland.
- The relevant permits must be obtained from the competent authority in order to remove any protected plant species.

#### **Stormwater management**

- Appropriate stormwater structures must be designed to minimise erosion and sedimentation of watercourses.
- All infrastructure situated on slopes must incorporate stormwater diversion.
- Flood attenuation and stormwater management plans must be drawn up by a qualified engineer and approved by DEDEAT, the ECO and DWS.
- Stormwater design must be in line with DWS requirements.

#### **Loss of natural sourveld**

- The layout of the project infrastructure must have as minimal impact on natural vegetation as possible.

#### **Loss of SCC**

- All plant SCC must be relocated to outside the construction footprint prior to commencement of activities.
- The relevant permits must be obtained from the competent authority in order to remove any SCC.

#### **Invasion of alien plant species**

- A Rehabilitation and Alien Vegetation Management Plan must be designed to reduce the establishment and spread of undesirable alien plant species.

### **8.3.2 Construction Phase**

The following conditions associated with Construction Phase must be implemented:

#### **Material stockpiling**

- No construction material must be stored within 50 m of a watercourse.
- Stockpiles within 100 m of a watercourse must be monitored for erosion and mobilisation of materials towards watercourses. If this is noted by an ECO, suitable cut-off drains or berms must be placed between the stockpile area and the nearest watercourse.

#### **Stormwater management**

- Flood attenuation and stormwater management plans must be drawn up by a qualified engineer and approved by DWS.
- An Erosion and Sediment Management Plan must be developed to minimise the ingress of sediment-laden stormwater into rivers/wetlands and minimise erosion of the surrounding environment.

#### **Riparian vegetation**

- Removal of riparian vegetation must take place under the supervision of the ECO.
- A rehabilitation and Alien Vegetation Management Plan must be developed and implemented during construction.
- Vehicles and machinery must not encroach into sensitive areas outside the proposed feedlot footprint.

#### **Loss of natural vegetation**

- The construction footprint must be surveyed and demarcated prior to construction commencing to ensure that there is no unnecessary loss of natural vegetation outside the approved road upgrade footprint.
- Where vegetation has been cleared, site rehabilitation in terms of soil stabilisation and revegetation must be undertaken.

#### **Loss of SCC**

- All areas that will be impacted must be surveyed prior to topsoil removal in order to locate and rescue any SCC within the area and relocate them.
- No SCC must be removed from site. All SCC must be relocated immediately outside the construction and operational footprint.
- Search and rescue must be undertaken by a professional and qualified botanist.
- The contractor's staff must not poach or trap wild animals.
- The contractor's staff must not harvest any natural vegetation.

#### **Invasion of alien plant species**

- An Alien Management Plan must be developed and implemented during the construction phase to reduce the establishment and spread of undesirable alien plant species.
- Alien plants must be removed from the site through appropriate methods such as hand pulling, application of chemicals, cutting, etc.

#### **Rehabilitation of disturbed areas**

- All impacted areas must be rehabilitated back to Pondoland-Ugu Sandstone Sourveld.
- Only topsoil from the immediate area must be used for rehabilitation.
- All impacted areas must be restored as per the Rehabilitation Management Plan.

### **8.3.3 Operational Phase**

The following conditions associated with the Operational Phase must be implemented:

#### **Stormwater management**

- Flood attenuation and stormwater management plans drawn up by a qualified engineer and approved by DEDEAT and DWS must be monitored to ensure rivers and wetlands do not have changes in sediment levels caused by the ingress of sediment-laden stormwater.
- An Erosion and Sediment Management Plan must be monitored to ensure rivers and wetlands do not have changes in sediment levels caused by the ingress of sediment-laden stormwater.

#### **Loss of natural vegetation**

- All road maintenance activities must be limited to the road reserve.
- No activities must occur outside the road reserve without prior approval.

#### **Loss of SCC**

- All road maintenance activities must be limited to the road reserve.
- No activities must occur outside the road reserve without prior approval.
- The relevant permits must be obtained from the competent authority in order to remove any SCC should this be required.

#### **Invasion of alien plant species**

- An Alien Plant Management Plan must be implemented during the operational phase to reduce the establishment and spread of undesirable alien plant species.
- Alien plants must be removed through appropriate methods such as hand pulling, application of chemicals, cutting, etc. as in accordance to the NEMBA: Alien Invasive Species Regulations.

#### **8.4 Proposed management plans to be developed and implemented as part of the final EMPr**

In summary, the following plans need to be developed as part of the final EMPr and Project monitoring, incorporating all the issues, conclusions and recommendations of this report:

- Erosion and Sediment Management Plan
- Rehabilitation and Alien Vegetation Management Plan

#### **8.5 Environmental Statement and Opinion of the Specialist**

The ecological impacts of all aspects for the proposed road upgrade were assessed and considered to be ecologically acceptable, provided that the mitigation measures provided in this report are implemented. All impacts are rated as **MODERATE to HIGH pre-mitigation** (Table 8.1), therefore implementation of recommended mitigation measures coupled with comprehensive rehabilitation and monitoring in terms of re-vegetation and restoration is an important element of the mitigation strategy. Implementing the recommended mitigations measures will **reduce impacts to LOW**.

**9 REFERENCES**

- ALEXANDER, G. and MARAIS, J. 2010. A Guide to Reptiles of Southern Africa. Struik Nature, Cape Town.
- BRANCH, W.R. 1998. Field Guide to Snakes and Other Reptiles of Southern Africa. Fully revised and updated to include 83 new species. Struik, Cape Town.
- COWLING, R.M. AND HILTON-TAYLOR C. (1994). Patterns of plant diversity and endemism in southern Africa: an overview. *Strelitzia* 1: 31-52.
- GAUCH, H.G. 1982. *Multivariate Analysis in Community Ecology*. Cambridge University Press.
- GOOD, R. 1974. *The Geography of Flowering Plants* 4th edn. Longmans, London.
- IUCN. 2012. Red List of Threatened Species. IUCN Species Survival Commission, Cambridge Available: <http://www.iucnredlist.org/> (Accessed 03/08/2012).
- MUCINA, L. & RUTHERFORD, M.C. (eds). 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.
- MUCINA, I.; HOARE, D.B.; LOTTER, M.C.; DU PREEZ, P.J.; RUTHERFORD, M.C.; SCOTT-SHAW, C.R.; BREDEKAMP, G.J.; POWRIE, L.W.; SCOTT, L.; CAMP, K.G.T.; CILLIERS, S.S.; BEZUIDENHOUT, H. MOSTERT, T.H.; SIEBERT, S.J.; WINTER, J.D.; BURROWS, J.E.; DOBSON, L.; WARD, R.A.; STALMANS, M.; OLIVER, E.G.H.; SIEBERT, F.; KOBISI, K AND KOSE, L. 2006. Grassland Biome. IN *The Vegetation of South Africa, Lesotho and Swaziland*. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.
- MUCINA, L.; SCOTT-SHAW, C.R.; RUTHERFORD, M.C.; CAMP, K.G.T.; MATTHEWS, W.S.; POWRIE, L.W. AND HOARE, D.B. 2006. Indian Coastal Belt IN *The Vegetation of South Africa, Lesotho and Swaziland*. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.
- MYERS, N. 1988. Threatened biotas: 'hot spots' in tropical forests. *Environmentalist* 8: 187-208.
- MYERS, N. 1990. The biodiversity challenge: expanded hot-spot analysis. *Environmentalist* 10: 243-256.
- PIERCE, S. M. and MADER, A. D. 2006. *The STEP Handbook. Integrating the natural environment into land use decisions at the municipal level: towards sustainable development*. Centre for African Conservation Ecology (ACE). Report Number 47 (Second Edition). Nelson Mandela Metropolitan University, South Africa.
- STUART, C and STUART, T. 2007. *Field Guide to Mammals of southern Africa*. Struik Nature, Cape Town.
- RUTHERFORD, M.C.; MUCINA, L.; LOTTER, M.C.; BREDEKAMP, J; SMIT, J.H.L; SCOTT-SHAW, C.R.; HOARE, D.B.; GOODMAN, P.S.; BEZUIDENHOUT, H.; SCOTT, L.; ELLIS, F.; POWRIE, L.W.; SIEBERT, F.; MOSTERT, T.H.; HENNING, B.J.; VENTER, C.E.; CAMP, K.G.T.; SIEBERT, S.J.; MATTHEWS, S.; BURROWS, J.E.; DOBSON, L.; VAN ROOYEN, N.; SCHMIDT, E.; WINTER, J.D.; DU PREEZ, P.; WARD, R.A; WILLIAMSON, S. AND HURTER, J.H. 2006. Savanna Biome IN *The Vegetation of South Africa, Lesotho and Swaziland*. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.
- MUCINA, L AND GELDENHUYS, C. 2006. Afrotropical, Subtropical and Azonal Forests IN *The Vegetation of South Africa, Lesotho and Swaziland*. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.
- TOLLEY, K. 2010. *Bradypodion caffer*. The IUCN Red List of Threatened Species. Version 2014.3. [www.iucnredlist.org](http://www.iucnredlist.org/)>. Downloaded on 12 February 2015.



VAN WYK, A.E. and SMITH, G. 2001. Regions of floristic endemism in southern Africa. Umdaus Press, Pretoria. 199pp.

WHITE, F. 1983. The vegetation of Africa: a description memoir to accompany the Unesco/AETFAT/UNSO vegetation map of Africa. Natural Resources Research. Unesco. Paris.

## APPENDIX A

Family	Species	Threat status	Lifecycle	Growth forms
ACANTHACEAE	<i>Asystasia gangetica</i> (L.) T.Anderson subsp. <i>micrantha</i> (Nees) <i>Ensermu</i>	LC	Perennial	Herb
ACANTHACEAE	<i>Asystasia varia</i> N.E.Br.	LC	Perennial	Herb
ACANTHACEAE	<i>Chaetacanthus burchellii</i> Nees	LC	Perennial	Dwarf shrub, herb
ACANTHACEAE	<i>Chaetacanthus setiger</i> (Pers.) Lindl.	LC	Perennial	Dwarf shrub, herb, shrub
ACANTHACEAE	<i>Crabbea nana</i> Nees	LC	Perennial	Dwarf shrub, herb
ACANTHACEAE	<i>Hypoestes forskalii</i> (Vahl) R.Br.	LC	Perennial	Herb
ACANTHACEAE	<i>Isoglossa grantii</i> C.B.Clarke	LC	Perennial	Dwarf shrub, herb, shrub
ACANTHACEAE	<i>Isoglossa ovata</i> (Nees) Lindau	LC	Perennial	Herb
ACANTHACEAE	<i>Justicia campylostemon</i> (Nees) T.Anderson	LC	Perennial	Herb, shrub
ACANTHACEAE	<i>Mackaya bella</i> Harv.	LC	Perennial	Shrub, tree
ACANTHACEAE	<i>Ruellia cordata</i> Thunb.	LC	Perennial	Dwarf shrub, herb
ACANTHACEAE	<i>Thunbergia atriplicifolia</i> E.Mey. ex Nees	LC	Perennial	Dwarf shrub, herb
ACANTHACEAE	<i>Thunbergia capensis</i> Retz.	LC	Perennial	Herb, scrambler
ACANTHACEAE	<i>Thunbergia purpurata</i> Harv. ex C.B.Clarke	LC	Perennial	Climber, herb
AGAPANTHACEAE	<i>Agapanthus campanulatus</i> F.M.Leight. subsp. <i>patens</i> (F.M.Leight.) F.M.Leight.	LC	Perennial	Herb
AGAPANTHACEAE	<i>Agapanthus praecox</i> Willd. subsp. <i>orientalis</i> (F.M.Leight.) F.M.Leight.	LC	Perennial	Herb
AMARANTHACEAE	<i>Pupalia lappacea</i> (L.) A.Juss. var. <i>lappacea</i>	LC	Annual	Herb
AMARYLLIDACEAE	<i>Clivia gardenii</i> Hook.	VU; PNCO (Protected); NEMBA (Vulnerable)	Perennial	Geophyte
AMARYLLIDACEAE	<i>Clivia robusta</i> B.G.Murray, Ran, De Lange, Hammett, Truter & <i>Swanevelder</i>	VU; PNCO (Protected); NEMBA (Vulnerable)	Perennial	Geophyte
AMARYLLIDACEAE	<i>Cyrtanthus brachyscyphus</i> Baker	LC; PNCO (Protected)	Perennial	Geophyte
AMARYLLIDACEAE	<i>Cyrtanthus breviflorus</i> Harv.	LC; PNCO (Protected)	Perennial	Geophyte
AMARYLLIDACEAE	<i>Haemanthus albiflos</i> Jacq.	LC; PNCO (Protected)	Perennial	Geophyte, succulent

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
AMARYLLIDACEAE	<i>Scadoxus membranaceus (Baker) Friis &amp; Nordal</i>	LC; PNCO (Protected)	Perennial	Geophyte
ANACARDIACEAE	<i>Loxostylis alata A.Spreng. ex Rchb.</i>	Declining	Perennial	Shrub, tree
ANACARDIACEAE	<i>Searsia carnosula (Schönland) Moffett</i>	LC	Perennial	Dwarf shrub, shrub
ANACARDIACEAE	<i>Searsia dentata (Thunb.) F.A.Barkley</i>	LC	Perennial	Shrub, tree
ANACARDIACEAE	<i>Searsia natalensis (Bernh. ex C.Krauss) F.A.Barkley</i>	LC	Perennial	Shrub, tree
ANACARDIACEAE	<i>Searsia nebulosa (Schönland) Moffett forma nebulosa</i>	Not Evaluated	Perennial	Shrub, tree
ANNONACEAE	<i>Monanthes affra (Sond.) Verdc.</i>	LC	Perennial	Climber, shrub, tree
ANOMODONTACEAE	<i>Anomodon pseudotristis (Müll.Hal.) Kindb.</i>		Perennial	Bryophyte
ANTHERICACEAE	<i>Chlorophytum angulicaule (Baker) Kativu</i>	LC	Perennial	Herb
ANTHERICACEAE	<i>Chlorophytum cooperi (Baker) Nordal</i>	LC	Perennial	Herb
APIACEAE	<i>Afroscidium natalense (Sond.) P.J.D.Winter</i>	LC	Perennial	Herb
APIACEAE	<i>Alepidea natalensis J.M.Wood &amp; M.S.Evans</i>	LC	Perennial	Herb
APIACEAE	<i>Alepidea peduncularis A.Rich.</i>	DDT	Perennial	Herb
APIACEAE	<i>Apium prostratum Vent.</i>	Not Evaluated	Perennial	Herb
APIACEAE	<i>Centella asiatica (L.) Urb.</i>	LC	Perennial	Climber, herb
APIACEAE	<i>Centella glabrata L. var. natalensis Adamson</i>	LC	Perennial	Herb
APIACEAE	<i>Centella virgata (L.f.) Drude var. congesta Adamson</i>	LC	Perennial	Herb, suffrutex
APIACEAE	<i>Pimpinella affra (Eckl. &amp; Zeyh.) D.Dietr.</i>	LC	Perennial	Herb
APOCYNACEAE	<i>Asclepias albens (E.Mey.) Schltr.</i>	LC	Perennial	Herb
APOCYNACEAE	<i>Asclepias hastata (E.Mey.) Schltr.</i>	LC	Perennial	Herb
APOCYNACEAE	<i>Asclepias praemorsa Schltr.</i>	LC	Perennial	Herb
APOCYNACEAE	<i>Aspidoglossum carinatum (Schltr.) Kupicha</i>	LC	Perennial	Herb, succulent
APOCYNACEAE	<i>Brachystelma australe R.A.Dyer</i>	LC	Perennial	Geophyte, succulent
APOCYNACEAE	<i>Carissa bispinosa (L.) Desf. ex Brenan</i>	LC	Perennial	Shrub
APOCYNACEAE	<i>Carissa macrocarpa (Eckl.) A.DC.</i>	LC	Perennial	Shrub
APOCYNACEAE	<i>Ceropegia linearis E.Mey. subsp. linearis</i>	LC	Perennial	Climber, succulent
APOCYNACEAE	<i>Pachycarpus asperifolius Meisn.</i>	LC; PNCO (Protected)	Perennial	Herb, succulent
APOCYNACEAE	<i>Pachycarpus grandiflorus (L.f.) E.Mey. subsp. grandiflorus</i>	LC; PNCO (Protected)	Perennial	Herb, succulent

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
APOCYNACEAE	<i>Raphionacme galpinii</i> Schltr.	LC; PNCO (Protected)	Perennial	Geophyte, herb, succulent
APOCYNACEAE	<i>Raphionacme hirsuta</i> (E.Mey.) R.A.Dyer	LC; PNCO (Protected)	Perennial	Geophyte, herb, succulent
APOCYNACEAE	<i>Rauvolfia caffra</i> Sond.	LC; PNCO (Protected)	Perennial	Tree
APOCYNACEAE	<i>Schizoglossum atropurpureum</i> E.Mey. subsp. <i>virens</i> (E.Mey.) Kupicha	LC; PNCO (Protected)	Perennial	Herb, succulent
APOCYNACEAE	<i>Secamone alpini</i> Schult.	LC; PNCO (Protected)	Perennial	Climber
APOCYNACEAE	<i>Sisyranthus barbatus</i> (Turcz.) N.E.Br.	LC; PNCO (Protected)	Perennial	Herb
APOCYNACEAE	<i>Sisyranthus imberbis</i> Harv.	LC; PNCO (Protected)	Perennial	Herb
APOCYNACEAE	<i>Sisyranthus virgatus</i> E.Mey.	LC; PNCO (Protected)	Perennial	Herb
APOCYNACEAE	<i>Xysmalobium involucreatum</i> (E.Mey.) Decne.	LC; PNCO (Protected)	Perennial	Herb, succulent
APONOGETONACEAE	<i>Aponogeton natalensis</i> Oliv.	LC	Perennial	Epiphyte, geophyte, herb, hydrophyte, hyperhydate
AQUIFOLIACEAE	<i>Ilex mitis</i> (L.) Radlk. var. <i>mitis</i>	Declining; PNCO (Protected)	Perennial	Shrub, tree
ARACEAE	<i>Zantedeschia aethiopica</i> (L.) Spreng.	LC	Perennial	Geophyte, herb
ARALIACEAE	<i>Cussonia nicholsonii</i> Strey	LC	Perennial	Shrub, succulent, tree
ARALIACEAE	<i>Cussonia sphaerocephala</i> Strey	LC	Perennial	Succulent, tree
ARALIACEAE	<i>Cussonia spicata</i> Thunb.	LC	Perennial	Succulent, tree
ARALIACEAE	<i>Hydrocotyle bonariensis</i> Lam.	LC	Perennial	Herb, hydrophyte
ARALIACEAE	<i>Schefflera umbellifera</i> (Sond.) Baill.	LC	Perennial	Tree
ARCHIDIACEAE	<i>Archidium ohioense</i> Schimp. ex Müll.Hal.		Perennial	Bryophyte
ARECACEAE	<i>Jubaeopsis caffra</i> Becc.	EN	Perennial	Tree
ASPARAGACEAE	<i>Asparagus densiflorus</i> (Kunth) Jessop	LC	Perennial	Dwarf shrub
ASPARAGACEAE	<i>Asparagus laricinus</i> Burch.	LC	Perennial	Shrub
ASPHODELACEAE	<i>Aloe linearifolia</i> A.Berger	NT	Perennial	Herb, succulent
ASPHODELACEAE	<i>Bulbine latifolia</i> (L.f.) Schult. & J.H.Schult. var. <i>latifolia</i>	LC	Perennial	Geophyte, herb, succulent

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
ASPHODELACEAE	<i>Gasteria croucheri</i> (Hook.f.) Baker subsp. <i>croucheri</i>	VU; NEMBA (Vulnerable)	Perennial	Herb, succulent
ASPHODELACEAE	<i>Kniphofia coddiana</i> Cufod.	NT	Perennial	Herb
ASPHODELACEAE	<i>Kniphofia drepanophylla</i> Baker	VU	Perennial	Herb
ASPHODELACEAE	<i>Kniphofia laxiflora</i> Kunth	LC	Perennial	Herb
ASPHODELACEAE	<i>Kniphofia parviflora</i> Kunth	LC	Perennial	Herb
ASPHODELACEAE	<i>Kniphofia rooperi</i> (T.Moore) Lem.	LC	Perennial	Herb
ASPLENIACEAE	<i>Asplenium splendens</i> Kunze subsp. <i>splendens</i>	LC	Perennial	Epiphyte, geophyte, herb, lithophyte
ASTERACEAE	<i>Ageratum houstonianum</i> Mill.	Not Evaluated	Annual	Herb
ASTERACEAE	<i>Ambrosia artemisiifolia</i> L.	Not Evaluated	Annual	Herb
ASTERACEAE	<i>Arctotheca populifolia</i> (P.J.Bergius) Norl.	LC	Perennial	Herb, succulent
ASTERACEAE	<i>Arctotis arctotoides</i> (L.f.) O.Hoffm.	LC	Perennial	Herb
ASTERACEAE	<i>Aspilia natalensis</i> (Sond.) Wild	LC	Perennial	Herb
ASTERACEAE	<i>Aster bakerianus</i> Burt Davy ex C.A.Sm.	LC	Perennial	Herb
ASTERACEAE	<i>Aster harveyanus</i> Kuntze	LC	Perennial	Herb
ASTERACEAE	<i>Aster squamatus</i> (Spreng.) Hieron.	Not Evaluated	Annual	Herb
ASTERACEAE	<i>Athrixia phyllicoides</i> DC.	LC	Perennial	Shrub
ASTERACEAE	<i>Berkheya insignis</i> (Harv.) Thell.	LC	Perennial	Herb
ASTERACEAE	<i>Berkheya multijuga</i> (DC.) Roessler	LC	Perennial	Herb
ASTERACEAE	<i>Berkheya rhapontica</i> (DC.) Hutch. & Burt Davy subsp. <i>aristosa</i> (DC.) Roessler var. <i>aristosa</i>	LC	Perennial	Herb
ASTERACEAE	<i>Berkheya speciosa</i> (DC.) O.Hoffm. subsp. <i>speciosa</i>	LC	Perennial	Herb
ASTERACEAE	<i>Berkheya umbellata</i> DC.	LC	Perennial	Herb
ASTERACEAE	<i>Brachylaena uniflora</i> Harv.	LC	Perennial	Tree
ASTERACEAE	<i>Callilepis laureola</i> DC.	LC	Perennial	Herb
ASTERACEAE	<i>Chromolaena odorata</i> (L.) R.M.King & H.Rob.	Not Evaluated	Perennial	Shrub
ASTERACEAE	<i>Chrysanthemoides monilifera</i> (L.) Norl. subsp. <i>rotundata</i> (DC.) Norl.	LC	Perennial	Shrub, succulent
ASTERACEAE	<i>Chrysocoma ciliata</i> L.	LC	Perennial	Shrub
ASTERACEAE	<i>Conyza scabrida</i> DC.	LC	Perennial	Shrub

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
ASTERACEAE	<i>Dimorphotheca caulescens</i> Harv.	LC	Perennial	Herb
ASTERACEAE	<i>Dimorphotheca fruticosa</i> (L.) Less.	LC	Perennial	Herb, succulent, suffrutex
ASTERACEAE	<i>Euryops brachypodus</i> (DC.) B.Nord.	LC	Perennial	Shrub
ASTERACEAE	<i>Euryops brevipapposus</i> M.D.Hend.	LC	Perennial	Shrub
ASTERACEAE	<i>Euryops leiocarpus</i> (DC.) B.Nord.	LC	Perennial	Dwarf shrub
ASTERACEAE	<i>Felicia aethiopica</i> (Burm.f.) Bolus & Wolley-Dod ex Adamson & T.M.Salter subsp. <i>ecklonis</i> (Less.) Grau	LC	Perennial	Shrub
ASTERACEAE	<i>Felicia filifolia</i> (Vent.) Burt Davy subsp. <i>filifolia</i>	LC	Perennial	Shrub
ASTERACEAE	<i>Gazania linearis</i> (Thunb.) Druce var. <i>linearis</i>	LC	Perennial	Herb
ASTERACEAE	<i>Gazania rigens</i> (L.) Gaertn. var. <i>uniflora</i> (L.f.) Roessler	LC	Perennial	Herb
ASTERACEAE	<i>Gerbera piloselloides</i> (L.) Cass.	LC	Perennial	Herb
ASTERACEAE	<i>Helichrysum acutatum</i> DC.	LC	Perennial	Herb
ASTERACEAE	<i>Helichrysum adenocarpum</i> DC. subsp. <i>adenocarpum</i>	LC	Perennial	Herb
ASTERACEAE	<i>Helichrysum appendiculatum</i> (L.f.) Less.	LC	Perennial	Herb
ASTERACEAE	<i>Helichrysum aureum</i> (Houtt.) Merr. var. <i>monocephalum</i> (DC.) Hilliard	LC	Perennial	Herb
ASTERACEAE	<i>Helichrysum auriceps</i> Hilliard	LC	Perennial	Herb
ASTERACEAE	<i>Helichrysum cymosum</i> (L.) D.Don subsp. <i>cymosum</i>	LC	Perennial	Herb, shrub
ASTERACEAE	<i>Helichrysum decorum</i> DC.	LC	Biennial	Herb
ASTERACEAE	<i>Helichrysum ecklonis</i> Sond.	LC	Perennial	Herb
ASTERACEAE	<i>Helichrysum felinum</i> Less.	LC	Perennial	Herb
ASTERACEAE	<i>Helichrysum foetidum</i> (L.) Moench var. <i>foetidum</i>	Not Evaluated	Biennial	Herb
ASTERACEAE	<i>Helichrysum griseum</i> Sond.	LC	Perennial	Herb
ASTERACEAE	<i>Helichrysum herbaceum</i> (Andrews) Sweet	LC	Perennial	Herb
ASTERACEAE	<i>Helichrysum krebsianum</i> Less.	LC	Perennial	Herb
ASTERACEAE	<i>Helichrysum lepidissimum</i> S.Moore	LC	Perennial	Herb, shrub
ASTERACEAE	<i>Helichrysum miconiifolium</i> DC.	LC	Perennial	Herb
ASTERACEAE	<i>Helichrysum mixtum</i> (Kuntze) Moeser var. <i>mixtum</i>	LC	Perennial	Herb
ASTERACEAE	<i>Helichrysum nudifolium</i> (L.) Less. var. <i>nudifolium</i>	LC	Perennial	Herb



Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
ASTERACEAE	<i>Helichrysum nudifolium</i> (L.) Less. var. <i>oxyphyllum</i> (DC.) Beentje	LC	Perennial	Herb
ASTERACEAE	<i>Helichrysum nudifolium</i> (L.) Less. var. <i>pilosellum</i> (L.f.) Beentje	LC	Perennial	Herb
ASTERACEAE	<i>Helichrysum odoratissimum</i> (L.) Sweet var. <i>odoratissimum</i>	Not Evaluated	Perennial	Herb, shrub
ASTERACEAE	<i>Helichrysum pallidum</i> DC.	LC	Perennial	Herb
ASTERACEAE	<i>Helichrysum panduratum</i> O.Hoffm. var. <i>panduratum</i>	LC	Perennial	Herb, shrub
ASTERACEAE	<i>Helichrysum pannosum</i> DC.	EN	Perennial	Herb
ASTERACEAE	<i>Helichrysum populifolium</i> DC.	LC	Perennial	Shrub
ASTERACEAE	<i>Helichrysum spiralepis</i> Hilliard & B.L.Burt	LC	Perennial	Herb
ASTERACEAE	<i>Hilliardiella hirsuta</i> (DC.) H.Rob.	LC	Perennial	Herb
ASTERACEAE	<i>Hilliardiella nudicaulis</i> (DC.) H.Rob.	LC	Perennial	Geophyte, herb
ASTERACEAE	<i>Inulanthera dregeana</i> (DC.) Källersjö	LC	Perennial	Shrub
ASTERACEAE	<i>Inulanthera leucoclada</i> (DC.) Källersjö	LC	Perennial	Shrub
ASTERACEAE	<i>Lopholaena dregeana</i> DC.	LC	Perennial	Herb, succulent
ASTERACEAE	<i>Osteospermum grandidentatum</i> DC.	LC	Perennial	Herb
ASTERACEAE	<i>Osteospermum imbricatum</i> L. subsp. <i>nervatum</i> (DC.) Norl. var. <i>nervatum</i>	LC	Perennial	Shrub, suffrutex
ASTERACEAE	<i>Othonna natalensis</i> Sch.Bip.	LC	Perennial	Herb, succulent
ASTERACEAE	<i>Plecostachys serpyllifolia</i> (P.J.Bergius) Hilliard & B.L.Burt	LC	Perennial	Dwarf shrub
ASTERACEAE	<i>Relhania pungens</i> L'Hér. subsp. <i>angustifolia</i> (DC.) K.Bremer	LC	Perennial	Dwarf shrub
ASTERACEAE	<i>Schistostephium heptalobum</i> (DC.) Oliv. & Hiern	LC	Perennial	Shrub
ASTERACEAE	<i>Senecio albanensis</i> DC. var. <i>doroniciflorus</i> (DC.) Harv.	LC	Perennial	Herb
ASTERACEAE	<i>Senecio bupleuroides</i> DC.	LC	Perennial	Herb
ASTERACEAE	<i>Senecio caudatus</i> DC.	LC	Perennial	Herb
ASTERACEAE	<i>Senecio decurrens</i> DC.	LC	Biennial	Herb
ASTERACEAE	<i>Senecio discodregeanus</i> Hilliard & B.L.Burt	LC	Perennial	Herb
ASTERACEAE	<i>Senecio erubescens</i> Aiton var. <i>erubescens</i>	LC	Perennial	Herb
ASTERACEAE	<i>Senecio macrocephalus</i> DC.	LC	Perennial	Herb
ASTERACEAE	<i>Senecio macroglossoides</i> Hilliard	LC	Perennial	Climber, herb, succulent
ASTERACEAE	<i>Senecio oxyriifolius</i> DC. subsp. <i>oxyriifolius</i>	LC	Perennial	Herb, succulent

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
ASTERACEAE	<i>Senecio polyanthemoides</i> Sch.Bip.	LC	Annual	Herb
ASTERACEAE	<i>Senecio speciosus</i> Willd.	LC	Perennial	Herb
ASTERACEAE	<i>Senecio variabilis</i> Sch.Bip.	LC	Perennial	Herb
ASTERACEAE	<i>Seriphium plumosum</i> L.	Not Evaluated	Perennial	Shrub
ASTERACEAE	<i>Tolpis capensis</i> (L.) Sch.Bip.	LC	Perennial	Herb
ASTERACEAE	<i>Ursinia montana</i> DC. subsp. <i>montana</i>	LC	Perennial	Herb
ASTERACEAE	<i>Ursinia tenuiloba</i> DC.	LC	Annual	Herb
BARTRAMIACEAE	<i>Philonotis dregeana</i> (Müll.Hal.) A.Jaeger		Perennial	Bryophyte
BARTRAMIACEAE	<i>Philonotis hastata</i> (Duby) Wijk & Margad.		Perennial	Bryophyte
BEHNIACEAE	<i>Behnia reticulata</i> (Thunb.) Didr.	LC	Perennial	Climber
BLECHNACEAE	<i>Blechnum punctulatum</i> Sw. var. <i>punctulatum</i>	LC	Perennial	Geophyte, herb, lithophyte
BRASSICACEAE	<i>Heliophila elongata</i> (Thunb.) DC.	LC	Perennial	Dwarf shrub
BRASSICACEAE	<i>Heliophila rigidiuscula</i> Sond.	LC	Perennial	Herb
BRYACEAE	<i>Bryum apiculatum</i> Schwägr.		Perennial	Bryophyte, hydrophyte
BUDDLEJACEAE	<i>Buddleja pulchella</i> N.E.Br.	LC	Perennial	Climber, shrub
BUXACEAE	<i>Buxus natalensis</i> (Oliv.) Hutch.	LC	Perennial	Shrub, tree
CACTACEAE	<i>Rhipsalis baccifera</i> (J.S.Mill.) Stearn subsp. <i>mauritiana</i> (DC.) Barthlott	LC	Perennial	Epiphyte, lithophyte, succulent
CAMPANULACEAE	<i>Roella glomerata</i> A.DC.	LC	Perennial	Dwarf shrub
CAMPANULACEAE	<i>Wahlenbergia denudata</i> A.DC.	LC	Annual	Herb
CAMPANULACEAE	<i>Wahlenbergia huttonii</i> (Sond.) Thulin	LC	Perennial	Herb
CAMPANULACEAE	<i>Wahlenbergia krebsii</i> Cham. subsp. <i>krebsii</i>	LC	Perennial	Herb
CAMPANULACEAE	<i>Wahlenbergia paucidentata</i> Schinz	LC	Perennial	Herb
CAPPARACEAE	<i>Bachmannia woodii</i> (Oliv.) Gilg	LC	Perennial	Climber, shrub, tree
CARYOPHYLLACEAE	<i>Silene burchellii</i> Otth var. <i>angustifolia</i> Sond.	Not Evaluated	Perennial	Herb
CARYOPHYLLACEAE	<i>Silene primuliflora</i> Eckl. & Zeyh. var. <i>primuliflora</i>	LC	Perennial	Herb
CATAGONIACEAE	<i>Catagonium nitens</i> (Brid.) Cardot subsp. <i>maritimum</i> (Hook.) S.H.Lin		Perennial	Bryophyte,

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
				epiphyte
CELASTRACEAE	<i>Cassine peragua</i> L. subsp. <i>peragua</i>	LC	Perennial	Shrub, tree
CELASTRACEAE	<i>Gymnosporia bachmannii</i> Loes.	VU	Perennial	Shrub, tree
CELASTRACEAE	<i>Maytenus acuminata</i> (L.f.) Loes. var. <i>acuminata</i>	LC	Perennial	Shrub, tree
CELASTRACEAE	<i>Maytenus cordata</i> (E.Mey. ex Sond.) Loes.	LC	Perennial	Shrub, tree
CELASTRACEAE	<i>Maytenus procumbens</i> (L.f.) Loes.	LC	Perennial	Dwarf shrub, shrub, tree
CELASTRACEAE	<i>Myroxylon aethiopicum</i> (Thunb.) Loes. subsp. <i>aethiopicum</i>	LC	Perennial	Shrub, tree
CELASTRACEAE	<i>Robsonodendron eucleiforme</i> (Eckl. & Zeyh.) R.H.Archer	LC	Perennial	Tree
CELTIDACEAE	<i>Celtis africana</i> Burm.f.	LC	Perennial	Shrub, tree
CHENOPODIACEAE	<i>Sarcocornia natalensis</i> (Bunge ex Ung.-Sternb.) A.J.Scott var. <i>natalensis</i>	LC	Perennial	Dwarf shrub, succulent
CLUSIACEAE	<i>Garcinia gerrardii</i> Harv. ex Sim	LC	Perennial	Shrub, tree
COLCHICACEAE	<i>Gloriosa modesta</i> (Hook.) J.C.Manning & Vinn.	LC	Perennial	Climber, geophyte
COLCHICACEAE	<i>Gloriosa superba</i> L.	LC	Perennial	Climber, geophyte
COLCHICACEAE	<i>Wurmbea kraussii</i> Baker	LC	Perennial	Geophyte
COMMELINACEAE	<i>Commelina africana</i> L. var. <i>africana</i>	LC	Perennial	Herb
COMMELINACEAE	<i>Commelina benghalensis</i> L.	LC	Annual	Herb
COMMELINACEAE	<i>Commelina erecta</i> L.	LC	Perennial	Herb
COMMELINACEAE	<i>Commelina modesta</i> Oberm.	LC	Perennial	Herb
COMMELINACEAE	<i>Cyanotis speciosa</i> (L.f.) Hassk.	LC	Perennial	Herb, succulent
CONNARACEAE	<i>Cnestis polyphylla</i> Lam.	LC	Perennial	Climber, shrub, tree
CONVOLVULACEAE	<i>Convolvulus farinosus</i> L.	LC	Perennial	Climber, herb
CONVOLVULACEAE	<i>Hewittia malabarica</i> (L.) Suresh	LC	Perennial	Climber, herb
CONVOLVULACEAE	<i>Ipomoea cairica</i> (L.) Sweet var. <i>cairica</i>	LC	Perennial	Climber, herb, succulent
CONVOLVULACEAE	<i>Ipomoea crassipes</i> Hook. var. <i>crassipes</i>	LC	Perennial	Herb, succulent
CONVOLVULACEAE	<i>Ipomoea simplex</i> Thunb.	LC	Perennial	Herb, succulent
CRASSULACEAE	<i>Crassula obovata</i> Haw. var. <i>dregeana</i> (Harv.) Toelken	VU	Perennial	Dwarf shrub, succulent

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
CRASSULACEAE	<i>Crassula pellucida</i> L. subsp. <i>brachypetala</i> (Drège ex Harv.) Toelken	LC	Perennial	Herb, scrambler, succulent
CRASSULACEAE	<i>Crassula sarmentosa</i> Harv. var. <i>sarmentosa</i>	LC	Perennial	Herb, scrambler, succulent
CRASSULACEAE	<i>Crassula vaginata</i> Eckl. & Zeyh. subsp. <i>vaginata</i>	LC	Perennial	Herb, succulent
CUCURBITACEAE	<i>Cucumis hirsutus</i> Sond.	LC	Perennial	Herb, succulent
CUCURBITACEAE	<i>Momordica balsamina</i> L.	LC	Perennial	Climber, herb, succulent
CYATHEACEAE	<i>Alsophila dregei</i> (Kunze) R.M.Tryon	LC	Perennial	Tree
CYPERACEAE	<i>Abildgaardia hygrophila</i> (Gordon-Gray) Lye	LC	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Abildgaardia ovata</i> (Burm.f.) Kral	LC	Perennial	Cyperoid, helophyte, herb, mesophyte
CYPERACEAE	<i>Ascolepis capensis</i> (Kunth) Ridl.	LC	Perennial	Cyperoid, herb
CYPERACEAE	<i>Bulbostylis contexta</i> (Nees) M.Bodard	LC	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Bulbostylis densa</i> (Wall.) Hand.-Mazz. subsp. <i>afromontana</i> (Lye) R.W.Haines	LC	Annual	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Bulbostylis humilis</i> (Kunth) C.B.Clarke	LC	Annual	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Bulbostylis oritrephes</i> (Ridl.) C.B.Clarke	LC	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Bulbostylis scleropus</i> C.B.Clarke	LC	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Carpha glomerata</i> (Thunb.) Nees	LC	Perennial	Cyperoid, emergent hydrophyte, helophyte, herb
CYPERACEAE	<i>Cyathocoma bachmannii</i> (Kük.) C.Archer	LC	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Cyperus albostrigatus</i> Schrad.	LC	Perennial	Cyperoid, herb, mesophyte

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
CYPERACEAE	<i>Cyperus brevis</i> Boeckeler	LC	Perennial	Cyperoid, helophyte, herb, mesophyte
CYPERACEAE	<i>Cyperus cyperoides</i> (L.) Kuntze subsp. <i>cyperoides</i>	LC	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Cyperus dubius</i> Rottb. var. <i>dubius</i>		[No lifecycle defined]	[No lifeform defined]
CYPERACEAE	<i>Cyperus obtusiflorus</i> Vahl var. <i>obtusiflorus</i>	LC	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Cyperus prolifer</i> Lam.	LC	Perennial	Cyperoid, emergent hydrophyte, helophyte, herb
CYPERACEAE	<i>Cyperus rupestris</i> Kunth var. <i>amnicola</i> (Kunth) Kük.	LC	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Cyperus sphaerospermus</i> Schrad.	LC	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Cyperus vorsteri</i> K.L.Wilson	LC	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Eleocharis variegata</i> (Poir.) C.Presl	LC	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Ficinia gracilis</i> Schrad.	LC	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Ficinia laciniata</i> (Thunb.) Nees	LC	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Ficinia stolonifera</i> Boeckeler	LC	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Fimbristylis complanata</i> (Retz.) Link	LC	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Fuirena ecklonii</i> Nees	LC	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Fuirena hirsuta</i> (P.J.Bergius) P.L.Forbes	LC	Perennial	Cyperoid, helophyte, herb

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
CYPERACEAE	<i>Fuirena pubescens (Poir.) Kunth var. pubescens</i>	LC	Perennial	Cyperoid, helophyte, herb, mesophyte
CYPERACEAE	<i>Kyllinga odorata Vahl</i>	LC	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Pycreus intactus (Vahl) J.Raynal</i>	LC	Perennial	Cyperoid, helophyte, herb, mesophyte
CYPERACEAE	<i>Pycreus mundii Nees</i>	LC	Perennial	Cyperoid, emergent hydrophyte, helophyte, herb, sudd hydrophyte
CYPERACEAE	<i>Pycreus nitidus (Lam.) J.Raynal</i>	LC	Perennial	Cyperoid, helophyte, herb, sudd hydrophyte
CYPERACEAE	<i>Pycreus oakfortensis C.B.Clarke</i>	LC	Perennial	Cyperoid, herb
CYPERACEAE	<i>Pycreus polystachyos (Rottb.) P.Beauv. var. polystachyos</i>	LC	Perennial	Cyperoid, helophyte, herb, mesophyte
CYPERACEAE	<i>Rhynchospora barrosiana Guagl.</i>	LC	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Rhynchospora brownii Roem. &amp; Schult.</i>	LC	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Rhynchospora holoschoenoides (Rich.) Herter</i>	LC	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Rhynchospora spectabilis Hochst.</i>	LC	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Schoenoxiphium lehmannii (Nees) Steud.</i>	LC	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Schoenoxiphium sparteum (Wahlenb.) C.B.Clarke</i>	LC	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Scleria angusta Nees ex Kunth</i>	LC	Perennial	Cyperoid,



Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
				emergent hydrophyte, helophyte, herb
CYPERACEAE	<i>Scleria bulbifera</i> Hochst. ex A.Rich.	LC	Perennial	Cyperoid, geophyte, herb, mesophyte
CYPERACEAE	<i>Scleria dieterlenii</i> Turrill	LC	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Scleria distans</i> Poir.	LC	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Scleria melanomphala</i> Kunth	LC	Perennial	Cyperoid, emergent hydrophyte, helophyte, herb
CYPERACEAE	<i>Scleria natalensis</i> Boeckeler ex C.B.Clarke	LC	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Scleria woodii</i> C.B.Clarke	LC	Perennial	Cyperoid, helophyte, herb
CYPERACEAE	<i>Tetraria capillacea</i> (Thunb.) C.B.Clarke	LC	Perennial	Cyperoid, herb, mesophyte
CYPERACEAE	<i>Tetraria cuspidata</i> (Rottb.) C.B.Clarke var. <i>cuspidata</i>	LC	Perennial	Cyperoid, helophyte, herb, mesophyte
DAVALLIACEAE	<i>Davallia chaerophylloides</i> (Poir.) Steud.	LC	Perennial	Epiphyte, herb
DICRANACEAE	<i>Campylopus pilifer</i> Brid. var. <i>pilifer</i>		Perennial	Bryophyte
DIOSCOREACEAE	<i>Dioscorea cotinifolia</i> Kunth	LC	Perennial	Climber, geophyte, succulent
DIPSACACEAE	<i>Cephalaria oblongifolia</i> (Kuntze) Szabó	LC	Perennial	Herb
DIPSACACEAE	<i>Cephalaria pungens</i> Szabó	LC	Perennial	Herb
DIPSACACEAE	<i>Scabiosa columbaria</i> L.	LC	Perennial	Herb
DRACAENACEAE	<i>Dracaena aletiformis</i> (Haw.) Bos	LC	Perennial	Succulent, tree
DROSERACEAE	<i>Drosera burkeana</i> Planch.	LC	Perennial	Carnivore, herb

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
DROSERACEAE	<i>Drosera madagascariensis</i> DC.	LC	Perennial	Carnivore, herb
DROSERACEAE	<i>Drosera natalensis</i> Diels	LC	Perennial	Carnivore, herb
EBENACEAE	<i>Diospyros scabrida</i> (Harv. ex Hiern) De Winter var. <i>scabrida</i>	LC	Perennial	Shrub
EBENACEAE	<i>Diospyros villosa</i> (L.) De Winter var. <i>villosa</i>	LC	Perennial	Climber, shrub
EBENACEAE	<i>Diospyros whyteana</i> (Hiern) F.White	LC	Perennial	Shrub, tree
ELAPHOGLOSSACEAE	<i>Elaphoglossum angustatum</i> (Schrad.) Hieron.	LC	Perennial	Herb, lithophyte
ERICACEAE	<i>Erica abbottii</i> E.G.H.Oliv.	VU; PNCO (Protected)	Perennial	Dwarf shrub
ERICACEAE	<i>Erica caffra</i> L. var. <i>caffra</i>	LC; PNCO (Protected)	Perennial	Shrub, tree
ERICACEAE	<i>Erica cerinthoides</i> L. var. <i>cerinthoides</i>	LC; PNCO (Protected)	Perennial	Shrub
ERICACEAE	<i>Erica cubica</i> L. var. <i>coronifera</i> Bolus	LC; PNCO (Protected)	Perennial	Dwarf shrub, shrub
ERICACEAE	<i>Erica cubica</i> L. var. <i>cubica</i>	LC; PNCO (Protected)	Perennial	Dwarf shrub
ERICACEAE	<i>Erica cubica</i> L. var. <i>natalensis</i> Bolus	LC; PNCO (Protected)	Perennial	Dwarf shrub
ERICACEAE	<i>Erica natalitia</i> Bolus var. <i>natalitia</i>	LC; PNCO (Protected)	Perennial	Shrub
ERIOCAULACEAE	<i>Eriocaulon dregei</i> Hochst.	LC	Perennial	Helophyte, herb, hydrophyte
ERIOSPERMACEAE	<i>Eriospermum cooperi</i> Baker var. <i>cooperi</i>	LC	Perennial	Geophyte
ERIOSPERMACEAE	<i>Eriospermum cooperi</i> Baker var. <i>natalense</i> (Baker) P.L.Perry	LC	Perennial	Geophyte
ERIOSPERMACEAE	<i>Eriospermum mackenii</i> (Hook.f.) Baker subsp. <i>mackenii</i>	Not Evaluated	Perennial	Geophyte, herb
ERYTHROXYLACEAE	<i>Erythroxylum emarginatum</i> Thonn.	LC	Perennial	Shrub, tree
ERYTHROXYLACEAE	<i>Erythroxylum pictum</i> E.Mey. ex Sond.	LC	Perennial	Shrub, tree
EUPHORBIACEAE	<i>Acalypha ecklonii</i> Baill.	LC	Annual	Herb
EUPHORBIACEAE	<i>Acalypha peduncularis</i> E.Mey. ex Meisn.	LC	Perennial	Dwarf shrub, herb
EUPHORBIACEAE	<i>Acalypha punctata</i> Meisn. var. <i>punctata</i>	LC	Perennial	Dwarf shrub, herb
EUPHORBIACEAE	<i>Clutia abyssinica</i> Jaub. & Spach var. <i>abyssinica</i>	LC	Perennial	Shrub, tree
EUPHORBIACEAE	<i>Clutia cordata</i> Bernh.	LC	Perennial	Dwarf shrub, herb
EUPHORBIACEAE	<i>Clutia laxa</i> Eckl. ex Sond.	LC	Perennial	Shrub
EUPHORBIACEAE	<i>Clutia platyphylla</i> Pax & K.Hoffm.	LC	Perennial	Dwarf shrub, herb
EUPHORBIACEAE	<i>Clutia pulchella</i> L. var. <i>pulchella</i>	LC	Perennial	Dwarf shrub, herb, shrub
EUPHORBIACEAE	<i>Clutia virgata</i> Pax & K.Hoffm.	LC	Perennial	Dwarf shrub, herb

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
EUPHORBIACEAE	<i>Excoecaria simii</i> (Kuntze) Pax	LC	Perennial	Shrub, tree
EUPHORBIACEAE	<i>Macaranga capensis</i> (Baill.) Benth. ex Sim var. <i>capensis</i>	LC	Perennial	Tree
EUPHORBIACEAE	<i>Micrococca capensis</i> (Baill.) Prain	LC	Perennial	Shrub, tree
EUPHORBIACEAE	<i>Shirakiopsis elliptica</i> (Hochst.) Esser	LC	Perennial	Tree
EUPHORBIACEAE	<i>Suregada procera</i> (Prain) Croizat	LC	Perennial	Tree
FABACEAE	<i>Abrus laevigatus</i> E.Mey.	LC	Perennial	Climber
FABACEAE	<i>Acacia longifolia</i> (Andrews) Willd.	Not Evaluated	Perennial	Shrub, tree
FABACEAE	<i>Argyrolobium harveyanum</i> Oliv.	LC	Perennial	Dwarf shrub, herb
FABACEAE	<i>Argyrolobium humile</i> E.Phillips	LC	Perennial	Herb
FABACEAE	<i>Argyrolobium rotundifolium</i> T.J.Edwards	LC	Perennial	Herb
FABACEAE	<i>Chamaecrista comosa</i> E.Mey. var. <i>comosa</i>	LC	Perennial	Herb
FABACEAE	<i>Chamaecrista mimosoides</i> (L.) Greene	LC	Annual (occ. perennial)	Herb
FABACEAE	<i>Chamaecrista plumosa</i> E.Mey. var. <i>erecta</i> (Schorn & Gordon-Gray) Lock	LC	Perennial	Herb
FABACEAE	<i>Chamaecrista stricta</i> E.Mey.	LC	Annual	Herb
FABACEAE	<i>Crotalaria globifera</i> E.Mey.	LC	Annual (occ. perennial)	Herb, shrub
FABACEAE	<i>Desmodium dregeanum</i> Benth.	LC	Perennial	Dwarf shrub, herb
FABACEAE	<i>Desmodium incanum</i> DC.	Not Evaluated	Perennial	Dwarf shrub, herb
FABACEAE	<i>Desmodium setigerum</i> (E.Mey.) Benth. ex Harv.	LC	Perennial	Climber, herb
FABACEAE	<i>Dolichos falciformis</i> E.Mey.	LC	Perennial	Herb
FABACEAE	<i>Eriosema dregei</i> E.Mey.	LC	Perennial	Dwarf shrub, herb
FABACEAE	<i>Eriosema kraussianum</i> Meisn.	LC	Perennial	Herb
FABACEAE	<i>Eriosema latifolium</i> (Benth. ex Harv.) C.H.Stirt.	VU	Perennial	Dwarf shrub, herb
FABACEAE	<i>Eriosema luteopetalum</i> C.H.Stirt.	LC	Perennial	Dwarf shrub
FABACEAE	<i>Eriosema salignum</i> E.Mey.	LC	Perennial	Herb
FABACEAE	<i>Eriosema streyi</i> C.H.Stirt.	LC	Perennial	Herb
FABACEAE	<i>Indigofera dregeana</i> E.Mey.	LC	Perennial	Dwarf shrub
FABACEAE	<i>Indigofera foliosa</i> E.Mey.	LC	Perennial	Dwarf shrub

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
FABACEAE	<i>Indigofera hiliaris</i> Eckl. & Zeyh. var. <i>hiliaris</i>	LC	Perennial	Herb
FABACEAE	<i>Indigofera micrantha</i> E.Mey.	LC	Perennial	Shrub
FABACEAE	<i>Indigofera rostrata</i> Bolus	LC	Perennial	Dwarf shrub, herb
FABACEAE	<i>Indigofera rubroglandulosa</i> Germish.	LC	Perennial	Herb
FABACEAE	<i>Indigofera stricta</i> L.f.	LC	Perennial	Dwarf shrub
FABACEAE	<i>Indigofera velutina</i> E.Mey.	LC	Perennial	Herb
FABACEAE	<i>Lotononis bachmanniana</i> Dummer	NT	Perennial	Herb
FABACEAE	<i>Lotononis eriocarpa</i> (E.Mey.) B.-E.van Wyk	LC	Perennial	Shrub
FABACEAE	<i>Lotononis viminea</i> (E.Mey.) B.-E.van Wyk	LC	Perennial	Dwarf shrub
FABACEAE	<i>Lotus discolor</i> E.Mey. subsp. <i>discolor</i>	LC	Perennial	Herb
FABACEAE	<i>Ophrestia oblongifolia</i> (E.Mey.) H.M.L.Forbes var. <i>oblongifolia</i>	LC	Annual	Herb
FABACEAE	<i>Otholobium polyphyllum</i> (Eckl. & Zeyh.) C.H.Stirt.	LC	Perennial	Dwarf shrub
FABACEAE	<i>Philenoptera sutherlandii</i> (Harv.) Schrire	LC	Perennial	Tree
FABACEAE	<i>Podalyria burchellii</i> DC.	LC	Perennial	Shrub
FABACEAE	<i>Podalyria velutina</i> Burch. ex Benth.	Not Evaluated	Perennial	Shrub
FABACEAE	<i>Psoralea abbottii</i> C.H.Stirt.	VU	Perennial	Dwarf shrub
FABACEAE	<i>Psoralea affinis</i> Eckl. & Zeyh.	LC	Perennial	Shrub
FABACEAE	<i>Psoralea pinnata</i> L. var. <i>pinnata</i>	LC	Perennial	Shrub, tree
FABACEAE	<i>Rafnia elliptica</i> Thunb.	LC	Perennial	Shrub
FABACEAE	<i>Rhynchosia cooperi</i> (Harv. ex Baker f.) Burt Davy	LC	Perennial	Climber, herb
FABACEAE	<i>Rhynchosia totta</i> (Thunb.) DC. var. <i>totta</i>	LC	Perennial	Climber, herb
FABACEAE	<i>Tephrosia acaciifolia</i> Baker	LC	Annual (occ. perennial)	Herb
FABACEAE	<i>Tephrosia kraussiana</i> Meisn.	LC	Perennial	Dwarf shrub, herb
FABACEAE	<i>Tephrosia macropoda</i> (E.Mey.) Harv. var. <i>macropoda</i>	LC	Perennial	Herb
FABACEAE	<i>Tephrosia pondoensis</i> (Codd) Schrire	EN	Perennial	Tree
FABACEAE	<i>Trifolium burchellianum</i> Ser. subsp. <i>burchellianum</i>	LC	Perennial	Herb
FABACEAE	<i>Vigna vexillata</i> (L.) A.Rich. var. <i>ovata</i> (E.Mey.) B.J.Pienaar	LC	Perennial	Creeper, herb
FABACEAE	<i>Vigna vexillata</i> (L.) A.Rich. var. <i>vexillata</i>	LC	Perennial	Climber, herb
FABACEAE	<i>Zornia linearis</i> E.Mey.	LC	Perennial	Herb

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
FISSIDENTACEAE	<i>Fissidens ovatus</i> Brid.		Perennial	Bryophyte, hydrophyte
FLACOURTIACEAE	<i>Gerrardina foliosa</i> Oliv.	LC	Perennial	Shrub, tree
FUNARIACEAE	<i>Funaria hygrometrica</i> Hedw.		Annual (occ. perennial)	Bryophyte
GENTIANACEAE	<i>Chironia albiflora</i> Hilliard	Rare	Perennial	Herb
GENTIANACEAE	<i>Chironia baccifera</i> L.	LC	Perennial	Dwarf shrub, herb, suffrutex
GENTIANACEAE	<i>Chironia krebsii</i> Griseb.	LC	Annual (occ. perennial)	Herb
GENTIANACEAE	<i>Sebaea filiformis</i> Schinz	LC	Annual	Herb
GERANIACEAE	<i>Geranium flanagani</i> R.Knuth	LC	Perennial	Herb
GERANIACEAE	<i>Geranium subglabrum</i> Hilliard & B.L.Burt	LC	Perennial	Herb, scrambler
GERANIACEAE	<i>Monsonia natalensis</i> R.Knuth	LC	Annual	Herb
GERANIACEAE	<i>Pelargonium capitatum</i> (L.) L'Hér.	LC	Perennial	Dwarf shrub, shrub
GERANIACEAE	<i>Pelargonium luridum</i> (Andrews) Sweet	LC	Perennial	Geophyte, succulent
GLEICHENIACEAE	<i>Gleichenia polypodioides</i> (L.) Sm.	LC	Perennial	Herb, scrambler
HEMEROCALLIDACEAE	<i>Caesia contorta</i> (L.f.) T.Durand & Schinz	LC	Perennial	Herb
HYACINTHACEAE	<i>Albuca collina</i> Baker	LC	Perennial	Geophyte
HYACINTHACEAE	<i>Albuca setosa</i> Jacq.	LC	Perennial	Geophyte
HYACINTHACEAE	<i>Dipcadi marlothii</i> Engl.	LC	Perennial	Geophyte
HYACINTHACEAE	<i>Drimia cyanelloides</i> (Baker) J.C.Manning & Goldblatt	DDD	Perennial	Geophyte
HYACINTHACEAE	<i>Ledebouria revoluta</i> (L.f.) Jessop	LC	Perennial	Geophyte
HYACINTHACEAE	<i>Merwillia plumbea</i> (Lindl.) Speta	NT; NEMBA (Protected)	Perennial	Geophyte
HYACINTHACEAE	<i>Ornithogalum juncifolium</i> Jacq. var. <i>juncifolium</i>	LC	Perennial	Geophyte, succulent
HYACINTHACEAE	<i>Ornithogalum paludosum</i> Baker	LC	Perennial	Geophyte
HYACINTHACEAE	<i>Ornithogalum tenuifolium</i> F.Delaroche subsp. <i>tenuifolium</i>	Not Evaluated	Perennial	Geophyte
HYACINTHACEAE	<i>Schizocarpus nervosus</i> (Burch.) Van der Merwe	LC	Perennial	Geophyte
HYPERICACEAE	<i>Hypericum lalandii</i> Choisy	LC	Perennial	Herb

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
HYOPTERYGIACEAE	<i>Lopidium struthiopteris</i> (Brid.) M.Fleisch.		Perennial	Bryophyte, epiphyte
HYPOXIDACEAE	<i>Hypoxis acuminata</i> Baker	LC	Perennial	Geophyte
HYPOXIDACEAE	<i>Hypoxis angustifolia</i> Lam. var. <i>angustifolia</i>	LC	Perennial	Geophyte
HYPOXIDACEAE	<i>Hypoxis angustifolia</i> Lam. var. <i>buchananii</i> Baker x <i>H. membranacea</i> Baker	Not Evaluated	Perennial	Geophyte
HYPOXIDACEAE	<i>Hypoxis filiformis</i> Baker	LC	Perennial	Geophyte
HYPOXIDACEAE	<i>Hypoxis interjecta</i> Nel	LC	Perennial	Geophyte
HYPOXIDACEAE	<i>Hypoxis longifolia</i> Baker	LC	Perennial	Geophyte
HYPOXIDACEAE	<i>Hypoxis ludwigii</i> Baker	LC	Perennial	Geophyte
HYPOXIDACEAE	<i>Hypoxis sobolifera</i> Jacq. var. <i>sobolifera</i> (Jacq.) Nel	LC	Perennial	Geophyte
ICACINACEAE	<i>Apodytes abbotii</i> Potgieter & A.E.van Wyk	NT	Perennial	Shrub, tree
ICACINACEAE	<i>Apodytes dimidiata</i> E.Mey. ex Arn. subsp. <i>dimidiata</i>	LC	Perennial	Shrub, tree
ICACINACEAE	<i>Cassinopsis tinifolia</i> Harv.	LC	Perennial	Shrub, tree
IRIDACEAE	<i>Aristea abyssinica</i> Pax	LC; PNCO (Protected)	Perennial	Herb
IRIDACEAE	<i>Aristea angolensis</i> Baker subsp. <i>angolensis</i>	LC; PNCO (Protected)	Perennial	Herb
IRIDACEAE	<i>Aristea ecklonii</i> Baker	LC; PNCO (Protected)	Perennial	Herb
IRIDACEAE	<i>Aristea gerrardii</i> Weim.	LC; PNCO (Protected)	Perennial	Herb
IRIDACEAE	<i>Aristea platycaulis</i> Baker	VU; PNCO (Protected)	Perennial	Herb
IRIDACEAE	<i>Aristea torulosa</i> Klatt	LC; PNCO (Protected)	Perennial	Herb
IRIDACEAE	<i>Dierama atrum</i> N.E.Br.	LC; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Dierama igneum</i> Klatt	LC; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Freesia laxa</i> (Thunb.) Goldblatt & J.C.Manning subsp. <i>laxa</i>	LC; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Gladiolus dalenii</i> Van Geel subsp. <i>dalenii</i>	LC; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Gladiolus longicollis</i> Baker subsp. <i>longicollis</i>	LC; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Gladiolus longicollis</i> Baker subsp. <i>platypetalus</i> (Baker) Goldblatt & J.C.Manning	LC; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Gladiolus oppositiflorus</i> Herb.	Declining; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Gladiolus wilsonii</i> (Baker) Goldblatt & J.C.Manning	LC; PNCO (Protected)	Perennial	Geophyte, herb



Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
IRIDACEAE	<i>Hesperantha baurii</i> Baker subsp. <i>baurii</i>	LC; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Hesperantha modesta</i> Baker	LC; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Moraea elliotii</i> Baker	LC; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Moraea graminicola</i> Oberm. subsp. <i>notata</i> Goldblatt	LC; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Moraea stricta</i> Baker	LC; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Tritonia disticha</i> (Klatt) Baker subsp. <i>disticha</i>	LC; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Tritonia disticha</i> (Klatt) Baker subsp. <i>rubrolucens</i> (R.C.Foster) M.P.de Vos	LC; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Tritonia gladiolaris</i> (Lam.) Goldblatt & J.C.Manning	LC; PNCO (Protected)	[No lifecycle defined]	[No lifeform defined]
IRIDACEAE	<i>Watsonia angusta</i> Ker Gawl.	LC; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Watsonia bachmannii</i> L.Bolus	VU; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Watsonia confusa</i> Goldblatt	LC; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Watsonia densiflora</i> Baker	LC; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Watsonia pillansii</i> L.Bolus	LC; PNCO (Protected)	Perennial	Geophyte, herb
IRIDACEAE	<i>Watsonia pondoensis</i> Goldblatt	EN; PNCO (Protected)	Perennial	Geophyte, herb
JUNCACEAE	<i>Juncus kraussii</i> Hochst. subsp. <i>kraussii</i>	LC	Perennial	Helophyte, herb
JUNCACEAE	<i>Juncus lomatophyllus</i> Spreng.	LC	Perennial	Herb, hydrophyte, hyperhydrite
JUNCACEAE	<i>Juncus oxycarpus</i> E.Mey. ex Kunth	LC	Perennial	Helophyte, herb
JUNCAGINACEAE	<i>Triglochin bulbosa</i> L.	LC	Perennial	Helophyte, herb
LAMIACEAE	<i>Aeollanthus parvifolius</i> Benth.	LC	Perennial	Herb, succulent
LAMIACEAE	<i>Ajuga ophrydis</i> Burch. ex Benth.	LC	Perennial	Herb
LAMIACEAE	<i>Endostemon obtusifolius</i> (E.Mey. ex Benth.) N.E.Br.	LC	Perennial	Herb, shrub
LAMIACEAE	<i>Leonotis leonurus</i> (L.) R.Br.	LC	Perennial	Shrub
LAMIACEAE	<i>Plectranthus ambiguus</i> (Bolus) Codd	LC	Perennial	Dwarf shrub, herb
LAMIACEAE	<i>Plectranthus ciliatus</i> E.Mey. ex Benth.	LC	Perennial	Herb
LAMIACEAE	<i>Plectranthus ernstii</i> Codd	NT	Perennial	Herb, succulent
LAMIACEAE	<i>Plectranthus hilliardiae</i> Codd subsp. <i>hilliardiae</i>	LC	Perennial	Herb, succulent
LAMIACEAE	<i>Plectranthus saccatus</i> Benth. var. <i>saccatus</i>	LC	Perennial	Herb, succulent

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
LAMIACEAE	<i>Plectranthus strigosus</i> Benth.	LC	Perennial	Herb, succulent
LAMIACEAE	<i>Pycnostachys reticulata</i> (E.Mey.) Benth.	LC	Perennial	Herb
LAMIACEAE	<i>Rabdosiella calycina</i> (Benth.) Codd	LC	Perennial	Herb
LAMIACEAE	<i>Stachys natalensis</i> Hochst. var. <i>natalensis</i>	LC	Perennial	Herb
LAMIACEAE	<i>Stachys nigricans</i> Benth.	LC	Perennial	Herb
LAMIACEAE	<i>Syncolostemon densiflorus</i> Benth.	LC	Perennial	Shrub
LAMIACEAE	<i>Syncolostemon parviflorus</i> E.Mey. ex Benth. var. <i>parviflorus</i>	LC	Perennial	Dwarf shrub, herb
LAMIACEAE	<i>Syncolostemon rotundifolius</i> E.Mey. ex Benth.	LC	Perennial	Shrub
LAURACEAE	<i>Cassytha filiformis</i> L.	Not Evaluated	Perennial	Herb, parasite
LAURACEAE	<i>Cryptocarya woodii</i> Engl.	LC	Perennial	Tree
LAURACEAE	<i>Cryptocarya wyliei</i> Stapf	NT	Perennial	Shrub, tree
LENTIBULARIACEAE	<i>Genlisea hispidula</i> Stapf	LC	Annual (occ. perennial)	Carnivore, herb, pleustophyte
LENTIBULARIACEAE	<i>Utricularia livida</i> E.Mey.	LC	Annual (occ. perennial)	Carnivore, herb
LENTIBULARIACEAE	<i>Utricularia prehensilis</i> E.Mey.	LC	Perennial	Carnivore, herb
LENTIBULARIACEAE	<i>Utricularia sandersonii</i> Oliv.	LC	Perennial	Carnivore, herb, lithophyte
LOBELIACEAE	<i>Cyphia elata</i> Harv. var. <i>elata</i>	LC	Perennial	Herb
LOBELIACEAE	<i>Grammatotheca bergiana</i> (Cham.) C.Presl var. <i>bergiana</i>	LC	Perennial	Herb
LOBELIACEAE	<i>Lobelia anceps</i> L.f.	LC	Perennial	Herb
LOBELIACEAE	<i>Lobelia chamaedryfolia</i> (C.Presl) A.DC.	LC	Perennial	Herb
LOBELIACEAE	<i>Lobelia coronopifolia</i> L.	LC	Perennial	Dwarf shrub, herb
LOBELIACEAE	<i>Lobelia erinus</i> L.	LC	Annual (occ. perennial)	Herb
LOBELIACEAE	<i>Lobelia malowensis</i> E.Wimm.	LC	Perennial	Herb
LOBELIACEAE	<i>Lobelia pteropoda</i> (C.Presl) A.DC.	LC	Perennial	Herb
LOBELIACEAE	<i>Lobelia tomentosa</i> L.f.	LC	Perennial	Dwarf shrub, herb
LOBELIACEAE	<i>Monopsis scabra</i> (Thunb.) Urb.	LC	Perennial	Herb
LORANTHACEAE	<i>Erianthemum dregei</i> (Eckl. & Zeyh.) Tiegh.	LC	Perennial	Parasite, shrub, succulent

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
LYCOPODIACEAE	<i>Huperzia gnidioides</i> (L.f.) Trevis.	LC	Perennial	Epiphyte, herb, lithophyte
LYCOPODIACEAE	<i>Lycopodiella caroliniana</i> (L.) Pic.Serm.	LC	Perennial	Geophyte, herb
LYCOPODIACEAE	<i>Lycopodiella cernua</i> (L.) Pic.Serm.	LC	Perennial	Geophyte, herb
MALVACEAE	<i>Anisodonteia scabrosa</i> (L.) Bates	LC	Perennial	Dwarf shrub, shrub
MALVACEAE	<i>Grewia lasiocarpa</i> E.Mey. ex Harv.	LC	Perennial	Climber, shrub
MALVACEAE	<i>Grewia occidentalis</i> L. var. <i>occidentalis</i>	LC	Perennial	Shrub, tree
MALVACEAE	<i>Grewia pondoensis</i> Burret	NT	Perennial	Climber, shrub, tree
MALVACEAE	<i>Hibiscus aethiopicus</i> L. var. <i>ovatus</i> Harv.	LC	Perennial	Herb
MALVACEAE	<i>Hibiscus calyphyllus</i> Cav.	LC	Perennial	Dwarf shrub, herb
MALVACEAE	<i>Hibiscus diversifolius</i> Jacq. subsp. <i>diversifolius</i>	LC	Perennial	Shrub, tree
MALVACEAE	<i>Hibiscus pedunculatus</i> L.f.	LC	Perennial	Herb
MALVACEAE	<i>Hibiscus tiliaceus</i> L. subsp. <i>tiliaceus</i>	LC	Perennial	Shrub, tree
MALVACEAE	<i>Hibiscus trionum</i> L.		Annual	Herb
MARATTIACEAE	<i>Ptisana fraxinea</i> (Sm.) Murdock var. <i>salicifolia</i> (Schrad.) Murdock	Not Evaluated	[No lifecycle defined]	[No lifeform defined]
MELASTOMATAACEAE	<i>Dissotis canescens</i> (E.Mey. ex R.A.Graham) Hook.f.	LC	Perennial	Herb, shrub
MELASTOMATAACEAE	<i>Memecylon bachmannii</i> Engl.	LC	Perennial	Tree
MELIACEAE	<i>Ekebergia capensis</i> Sparrm.	LC	Perennial	Tree
MELIACEAE	<i>Turraea floribunda</i> Hochst.	LC	Perennial	Shrub, tree
MELIACEAE	<i>Turraea obtusifolia</i> Hochst.	LC	Perennial	Climber, shrub, tree
MELIANTHACEAE	<i>Bersama swinnyi</i> E.Phillips	LC	Perennial	Tree
MENYANTHACEAE	<i>Nymphoides thunbergiana</i> (Griseb.) Kuntze	LC	Perennial	Hydrophyte
MESEMBRYANTHEMACEAE	<i>Carpobrotus dimidiatus</i> (Haw.) L.Bolus	LC; PNCO (Protected)	Perennial	Succulent
MESEMBRYANTHEMACEAE	<i>Lampranthus fugitans</i> L.Bolus	VU; PNCO (Protected)	Perennial	Succulent
MOLLUGINACEAE	<i>Pharnaceum thunbergii</i> Adamson	LC	Perennial	Herb
MOLLUGINACEAE	<i>Psammotropha mucronata</i> (Thunb.) Fenzl var. <i>foliosa</i> Adamson	LC	Perennial	Herb

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
MORACEAE	<i>Ficus bizanae</i> Hutch. & Burt Davy	LC	Perennial	Tree
MORACEAE	<i>Ficus burtt-davyi</i> Hutch.	LC	Perennial	Climber, shrub
MORACEAE	<i>Ficus craterostoma</i> Warb. ex Mildbr. & Burret	LC	Perennial	Shrub, tree
MORACEAE	<i>Ficus ingens</i> (Miq.) Miq.	LC	Perennial	Tree
MYRICACEAE	<i>Morella serrata</i> (Lam.) Killick	LC	Perennial	Shrub, tree
MYRSINACEAE	<i>Rapanea melanophloeos</i> (L.) Mez	Declining	Perennial	Tree
MYRTACEAE	<i>Eucalyptus grandis</i> W.Hill ex Maiden	Not Evaluated	Perennial	Tree
MYRTACEAE	<i>Eugenia albanensis</i> Sond.	LC	Perennial	Dwarf shrub
MYRTACEAE	<i>Eugenia capensis</i> (Eckl. & Zeyh.) Sond. subsp. <i>capensis</i>	LC	Perennial	Shrub, tree
MYRTACEAE	<i>Eugenia erythrophylla</i> Strey	NT	Perennial	Shrub, tree
MYRTACEAE	<i>Eugenia verdoorniae</i> A.E.van Wyk	NT	Perennial	Shrub, tree
MYRTACEAE	<i>Eugenia zeyheri</i> (Harv.) Harv.	LC	Perennial	Shrub, tree
MYRTACEAE	<i>Psidium guajava</i> L.	Not Evaluated	Perennial	Shrub, tree
MYRTACEAE	<i>Syzygium cordatum</i> Hochst. ex C.Krauss subsp. <i>cordatum</i>	LC	Perennial	Shrub, tree
MYRTACEAE	<i>Syzygium pondoense</i> Engl.	Rare	Perennial	Shrub, tree
NECKERACEAE	<i>Porothamnium stipitatum</i> (Mitt.) Touw ex De Sloover		Perennial	Bryophyte, epiphyte
NECKERACEAE	<i>Porotrichum madagassum</i> Kiaer ex Besch.		Perennial	Bryophyte, epiphyte
NYMPHAEACEAE	<i>Nymphaea nouchali</i> Burm.f. var. <i>caerulea</i> (Savigny) Verdc.	LC	Perennial (occ. annual)	Epiphyte, herb, hydrophyte
NYMPHAEACEAE	<i>Nymphaea nouchali</i> Burm.f. var. <i>ovalifolia</i> (Conard) Verdc.		Perennial (occ. annual)	Epiphyte, herb, hydrophyte
OCHNACEAE	<i>Ochna arborea</i> Burch. ex DC. var. <i>arborea</i>	LC	Perennial	Shrub, tree
OCHNACEAE	<i>Ochna natalitia</i> (Meisn.) Walp.	LC	Perennial	Shrub, tree
OCHNACEAE	<i>Ochna serrulata</i> (Hochst.) Walp.	LC	Perennial	Shrub, tree
OLEACEAE	<i>Olea capensis</i> L. subsp. <i>capensis</i>	LC	Perennial	Shrub, tree
ORCHIDACEAE	<i>Acrolophia cochlearis</i> (Lindl.) Schltr. & Bolus	LC	Perennial	Herb
ORCHIDACEAE	<i>Angraecum pusillum</i> Lindl.	LC	Perennial	Epiphyte, herb
ORCHIDACEAE	<i>Bonatea boltonii</i> (Harv.) Bolus	LC	[No lifecycle defined]	[No lifeform defined]

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
ORCHIDACEAE	<i>Bonatea speciosa (L.f.) Willd.</i>	LC	[No lifecycle defined]	[No lifeform defined]
ORCHIDACEAE	<i>Brachycorythis ovata Lindl. subsp. ovata</i>	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Brachycorythis pubescens Harv.</i>	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Bulbophyllum scaberulum (Rolfe) Bolus var. scaberulum</i>	LC	Perennial	Epiphyte, herb, lithophyte, succulent
ORCHIDACEAE	<i>Cyrtorchis arcuata (Lindl.) Schltr. subsp. arcuata</i>	LC	Perennial	Epiphyte, herb, lithophyte
ORCHIDACEAE	<i>Disa baurii Bolus</i>	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Disa brevicornis (Lindl.) Bolus</i>	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Disa caffra Bolus</i>	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Disa polygonoides Lindl.</i>	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Disa tripetaloides (L.f.) N.E.Br.</i>	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Disa versicolor Rchb.f.</i>	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Disa woodii Schltr.</i>	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Eulophia angolensis (Rchb.f.) Summerh.</i>	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Eulophia hians Spreng. var. hians</i>	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Eulophia hians Spreng. var. nutans (Sond.) S.Thomas</i>	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Eulophia parviflora (Lindl.) A.V.Hall</i>	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Eulophia tenella Rchb.f.</i>	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Habenaria dives Rchb.f.</i>	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Liparis bowkeri Harv.</i>	LC	Perennial	Epiphyte, geophyte, herb, succulent
ORCHIDACEAE	<i>Polystachya pubescens (Lindl.) Rchb.f.</i>	LC	Perennial	Epiphyte, herb, succulent
ORCHIDACEAE	<i>Rangaeris muscicola (Rchb.f.) Summerh.</i>	LC	Perennial	Epiphyte, herb
ORCHIDACEAE	<i>Satyrium longicauda Lindl. var. longicauda</i>	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Satyrium sphaerocarpum Lindl.</i>	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Satyrium trinerve Lindl.</i>	LC	Perennial	Geophyte, herb

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
ORCHIDACEAE	<i>Schizochilus zeyheri</i> Sond.	LC	Perennial	Geophyte, herb
ORCHIDACEAE	<i>Stenoglottis macloughlinii</i> (L.Bolus) G.J.McDonald ex J.M.H.Shaw	Not Evaluated	[No lifecycle defined]	Geophyte, herb
ORCHIDACEAE	<i>Tridactyle tridentata</i> (Harv.) Schltr.	LC	Perennial	Epiphyte, herb, lithophyte, succulent
OROBANCHACEAE	<i>Alectra sessiliflora</i> (Vahl) Kuntze var. <i>sessiliflora</i>	LC	Annual (occ. perennial)	Herb, parasite
OROBANCHACEAE	<i>Buchnera dura</i> Benth.	LC	Annual (occ. perennial)	Herb, parasite
OROBANCHACEAE	<i>Buchnera longespicata</i> Schinz	LC	Annual	Herb, parasite
OROBANCHACEAE	<i>Cycnium adonense</i> E.Mey. ex Benth.	LC	Perennial	Herb, parasite
OROBANCHACEAE	<i>Cycnium racemosum</i> Benth.	LC	Perennial	Herb, parasite
OROBANCHACEAE	<i>Graderia scabra</i> (L.f.) Benth.	LC	Perennial	Herb, parasite, suffrutex
OROBANCHACEAE	<i>Harveya speciosa</i> Bernh.	LC	Perennial	Herb, parasite
OROBANCHACEAE	<i>Striga bilabiata</i> (Thunb.) Kuntze subsp. <i>bilabiata</i>	LC	Annual (occ. perennial)	Herb, parasite
ORTHOTRICHACEAE	<i>Cardotiella secunda</i> (Müll.Hal.) Vitt		Perennial	Bryophyte, epiphyte
ORTHOTRICHACEAE	<i>Macromitrium lebomboense</i> Van Rooy		Perennial	Bryophyte, epiphyte
OSMUNDACEAE	<i>Osmunda regalis</i> L.	LC	Perennial	Geophyte, herb, lithophyte
OXALIDACEAE	<i>Oxalis bifurca</i> Lodd. var. <i>bifurca</i>	LC	Perennial	Geophyte
PASSIFLORACEAE	<i>Basananthe sandersonii</i> (Harv.) W.J.de Wilde	LC	Perennial	Climber, dwarf shrub
PHYLLANTHACEAE	<i>Antidesma venosum</i> E.Mey. ex Tul.	LC	Perennial	Shrub, tree
PHYLLANTHACEAE	<i>Bridelia micrantha</i> (Hochst.) Baill.	LC	Perennial	Shrub, tree
PHYLLANTHACEAE	<i>Phyllanthus glaucophyllus</i> Sond.	LC	Perennial	Dwarf shrub, herb
PHYLLANTHACEAE	<i>Phyllanthus myrtaceus</i> Sond.	LC	Perennial	Shrub
PILOTRICHACEAE	<i>Callicostella tristis</i> (Müll.Hal.) Broth.		Perennial	Bryophyte,



Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
				epiphyte
PILOTRICHACEAE	<i>Hookeriopsis utacamundiana (Mont.) Broth.</i>		Perennial	Bryophyte, epiphyte
PIPERACEAE	<i>Peperomia blanda (Jacq.) Kunth</i>	LC	Perennial	Herb, succulent
PITOSPORACEAE	<i>Pittosporum viridiflorum Sims</i>	LC	Perennial	Shrub, tree
PLANTAGINACEAE	<i>Plantago longissima Decne.</i>	LC	Perennial	Herb
POACEAE	<i>Acroceras macrum Stapf</i>	LC	Perennial	Graminoid
POACEAE	<i>Alloteropsis semialata (R.Br.) Hitchc. subsp. eckloniana (Nees) Gibbs Russ.</i>	LC	Perennial	Graminoid
POACEAE	<i>Andropogon eucomus Nees</i>	LC	Perennial	Graminoid
POACEAE	<i>Aristida junciformis Trin. &amp; Rupr. subsp. junciformis</i>	LC	Perennial	Graminoid
POACEAE	<i>Arundinella nepalensis Trin.</i>	LC	Perennial	Graminoid
POACEAE	<i>Axonopus affinis Chase</i>	Not Evaluated	Perennial	Graminoid
POACEAE	<i>Brachiaria chusqueoides (Hack.) Clayton</i>	LC	Annual	Graminoid
POACEAE	<i>Chloris pycnothrix Trin.</i>	LC	Annual (occ. perennial)	Graminoid
POACEAE	<i>Coelorachis capensis Stapf</i>	LC	Perennial	Graminoid
POACEAE	<i>Cymbopogon nardus (L.) Rendle</i>	LC	Perennial	Graminoid
POACEAE	<i>Cynodon dactylon (L.) Pers.</i>	LC	Perennial	Graminoid
POACEAE	<i>Dactylis glomerata L.</i>	Not Evaluated	Perennial	Graminoid
POACEAE	<i>Dactyloctenium australe Steud.</i>	LC	Perennial	Graminoid
POACEAE	<i>Digitaria diagonalis (Nees) Stapf var. diagonalis</i>	LC	Perennial	Graminoid
POACEAE	<i>Digitaria eriantha Steud.</i>	LC	Perennial	Graminoid
POACEAE	<i>Digitaria natalensis Stent</i>	LC	Perennial	Graminoid
POACEAE	<i>Digitaria setifolia Stapf</i>	LC	Perennial	Graminoid
POACEAE	<i>Diheteropogon amplexans (Nees) Clayton var. amplexans</i>	LC	Perennial	Graminoid
POACEAE	<i>Diheteropogon filifolius (Nees) Clayton</i>	LC	Perennial	Graminoid
POACEAE	<i>Ehrharta erecta Lam. var. natalensis Stapf</i>	LC	Perennial	Graminoid
POACEAE	<i>Ehrharta rehmannii Stapf subsp. rehmannii</i>	LC	Perennial	Graminoid
POACEAE	<i>Eleusine coracana (L.) Gaertn. subsp. africana (Kenn.-O'Byrne) Hilu &amp;</i>	LC	Annual	Graminoid

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
	<i>de Wet</i>			
POACEAE	<i>Elionurus muticus (Spreng.) Kunth</i>	LC	Perennial	Graminoid
POACEAE	<i>Eragrostis acraea De Winter</i>	LC	Perennial	Graminoid
POACEAE	<i>Eragrostis capensis (Thunb.) Trin.</i>	LC	Perennial	Graminoid
POACEAE	<i>Eragrostis curvula (Schrad.) Nees</i>	LC	Perennial	Graminoid
POACEAE	<i>Eragrostis inamoena K.Schum.</i>	LC	Perennial	Graminoid
POACEAE	<i>Eragrostis racemosa (Thunb.) Steud.</i>	LC	Perennial	Graminoid
POACEAE	<i>Eriochrysis pallida Munro</i>	LC	Perennial	Graminoid
POACEAE	<i>Eulalia villosa (Thunb.) Nees</i>	LC	Perennial	Graminoid
POACEAE	<i>Harpochloa falx (L.f.) Kuntze</i>	LC	Perennial	Graminoid
POACEAE	<i>Helictotrichon hirtulum (Steud.) Schweick.</i>	LC	Perennial	Graminoid
POACEAE	<i>Hyparrhenia anamesa Clayton</i>	LC	Perennial	Graminoid
POACEAE	<i>Hyparrhenia filipendula (Hochst.) Stapf var. pilosa (Hochst.) Stapf</i>	LC	Perennial	Graminoid
POACEAE	<i>Imperata cylindrica (L.) Raeusch.</i>	LC	Perennial	Graminoid
POACEAE	<i>Ischaemum fasciculatum Brongn.</i>	LC	Perennial	Graminoid
POACEAE	<i>Koeleria capensis (Steud.) Nees</i>	LC	Perennial	Graminoid
POACEAE	<i>Loudetia simplex (Nees) C.E.Hubb.</i>	LC	Perennial	Graminoid
POACEAE	<i>Melinis nerviglumis (Franch.) Zizka</i>	LC	Perennial	Graminoid
POACEAE	<i>Microchloa caffra Nees</i>	LC	Perennial	Graminoid
POACEAE	<i>Miscanthus junceus (Stapf) Pilg.</i>	LC	Perennial	Graminoid
POACEAE	<i>Monocymbium ceresiiforme (Nees) Stapf</i>	LC	Perennial	Graminoid
POACEAE	<i>Olyra latifolia L.</i>	Not Evaluated	Perennial	Graminoid, scambler
POACEAE	<i>Oplismenus hirtellus (L.) P.Beauv.</i>	LC	Perennial	Graminoid, scambler
POACEAE	<i>Oplismenus undulatifolius (Ard.) Roem. &amp; Schult.</i>	LC	Perennial	Graminoid
POACEAE	<i>Oxyrhachis gracillima (Baker) C.E.Hubb.</i>	NT*	Perennial	Graminoid
POACEAE	<i>Panicum aequinerve Nees</i>	LC	Annual (occ. perennial)	Graminoid, scambler
POACEAE	<i>Panicum deustum Thunb.</i>	LC	Perennial	Graminoid

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
POACEAE	<i>Panicum dregeanum</i> Nees	LC	Perennial	Graminoid
POACEAE	<i>Panicum ecklonii</i> Nees	LC	Perennial	Graminoid
POACEAE	<i>Panicum maximum</i> Jacq.	LC	Perennial	Graminoid
POACEAE	<i>Panicum natalense</i> Hochst.	LC	Perennial	Graminoid
POACEAE	<i>Panicum parvifolium</i> Lam.	LC	Perennial	Graminoid
POACEAE	<i>Panicum repens</i> L.	LC	Perennial	Graminoid
POACEAE	<i>Panicum subalbidum</i> Kunth	LC	Annual (occ. perennial)	Graminoid
POACEAE	<i>Paspalum dilatatum</i> Poir.	Not Evaluated	Perennial	Graminoid
POACEAE	<i>Paspalum scrobiculatum</i> L.	LC	Perennial	Graminoid
POACEAE	<i>Phragmites australis</i> (Cav.) Steud.	LC	Perennial	Graminoid
POACEAE	<i>Pseudechinolaena polystachya</i> (Kunth) Stapf	LC	Annual (occ. perennial)	Graminoid
POACEAE	<i>Rendlia altera</i> (Rendle) Chiov.	LC	Perennial	Graminoid
POACEAE	<i>Rhynchachne rottboellioides</i> Desv.	LC	Perennial	Graminoid
POACEAE	<i>Sacciolepis indica</i> (L.) Chase	LC	Annual	Graminoid
POACEAE	<i>Schizachyrium sanguineum</i> (Retz.) Alston	LC	Perennial	Graminoid
POACEAE	<i>Setaria megaphylla</i> (Steud.) T.Durand & Schinz	LC	Perennial	Graminoid
POACEAE	<i>Setaria sphacelata</i> (Schumach.) Stapf & C.E.Hubb. ex M.B.Moss var. <i>sericea</i> (Stapf) Clayton	LC	Perennial	Graminoid
POACEAE	<i>Setaria sphacelata</i> (Schumach.) Stapf & C.E.Hubb. ex M.B.Moss var. <i>sphacelata</i>	LC	Perennial	Graminoid
POACEAE	<i>Sporobolus centrifugus</i> (Trin.) Nees	LC	Perennial	Graminoid
POACEAE	<i>Sporobolus subtilis</i> Kunth	LC	Perennial	Graminoid
POACEAE	<i>Sporobolus subulatus</i> Hack.	LC	Perennial	Graminoid
POACEAE	<i>Sporobolus virginicus</i> (L.) Kunth	LC	Perennial	Graminoid
POACEAE	<i>Stenotaphrum secundatum</i> (Walter) Kuntze	LC	Perennial	Graminoid
POACEAE	<i>Themeda triandra</i> Forssk.	LC	Perennial	Graminoid
POACEAE	<i>Trachypogon spicatus</i> (L.f.) Kuntze	LC	Perennial	Graminoid
POACEAE	<i>Trichopteryx dregeana</i> Nees	LC	Perennial	Graminoid

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
POACEAE	<i>Tristachya leucothrix</i> Trin. ex Nees	LC	Perennial	Graminoid
POACEAE	<i>Urelytrum agropyroides</i> (Hack.) Hack.	LC	Perennial	Graminoid
PODOCARPACEAE	<i>Podocarpus henkelii</i> Stapf ex Dallim. & A.B.Jacks.	LC	Perennial	Tree
PODOCARPACEAE	<i>Podocarpus latifolius</i> (Thunb.) R.Br. ex Mirb.	LC	Perennial	Tree
POLYGALACEAE	<i>Muraltia lancifolia</i> Harv.	LC	Perennial	Dwarf shrub
POLYGALACEAE	<i>Polygala capillaris</i> E.Mey. ex Harv. subsp. <i>capillaris</i>	LC	Annual	Herb
POLYGALACEAE	<i>Polygala fruticosa</i> P.J.Bergius	LC	Perennial	Dwarf shrub, shrub
POLYGALACEAE	<i>Polygala gazensis</i> Baker f.	LC	Perennial	Shrub, tree
POLYGALACEAE	<i>Polygala gracilentata</i> Burtt Davy	LC	Perennial	Herb
POLYGALACEAE	<i>Polygala hispida</i> Burch. ex DC.	LC	Perennial	Dwarf shrub, herb
POLYGALACEAE	<i>Polygala hottentotta</i> C.Presl	LC	Perennial	Dwarf shrub, herb
POLYGALACEAE	<i>Polygala houtboshiana</i> Chodat	LC	Perennial	Herb
POLYGALACEAE	<i>Polygala myrtifolia</i> L. var. <i>myrtifolia</i>	LC	Perennial	Shrub
POLYGALACEAE	<i>Polygala producta</i> N.E.Br.	LC	Perennial	Dwarf shrub, herb
POLYGALACEAE	<i>Polygala refracta</i> DC.	LC	Annual	Herb
POLYGALACEAE	<i>Polygala serpentaria</i> Eckl. & Zeyh.	LC	Perennial	Herb
POLYGALACEAE	<i>Polygala transvaalensis</i> Chodat subsp. <i>transvaalensis</i>	LC	Perennial	Herb
POLYGONACEAE	<i>Oxygonum dregeanum</i> Meisn. subsp. <i>dregeanum</i>	LC	Perennial	Herb
POLYPODIACEAE	<i>Microgramma mauritiana</i> (Willd.) Tardieu	LC	Perennial	Epiphyte, herb, lithophyte
POLYPODIACEAE	<i>Microsorium punctatum</i> (L.) Copel.	LC	Perennial	Epiphyte, herb, lithophyte
POLYPODIACEAE	<i>Microsorium scolopendria</i> (Burm.f.) Copel.	LC	Perennial	Geophyte, herb, lithophyte
POLYPODIACEAE	<i>Pyrrhosia africana</i> (Kunze) F.Ballard	LC	Perennial	Epiphyte, herb, lithophyte
POTTIACEAE	<i>Barbula bolleana</i> (Müll.Hal.) Broth.		Perennial	Bryophyte
POTTIACEAE	<i>Hypodontium dregei</i> (Hornsch.) Müll.Hal.		Perennial	Bryophyte, epiphyte
POTTIACEAE	<i>Hypodontium pomiforme</i> (Hook.) Müll.Hal.		Perennial	Bryophyte, epiphyte

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
POTTIACEAE	<i>Trichostomum brachydontium</i> Bruch		Perennial	Bryophyte
PRIONIACEAE	<i>Pronium serratum</i> (L.f.) Drège ex E.Mey.	Declining	Perennial	Herb, hydrophyte, hyperhydate
PROTEACEAE	<i>Hakea sericea</i> Schrad. & J.C.Wendl.	Not Evaluated; PNCO (Protected)	Perennial	Shrub
PROTEACEAE	<i>Leucadendron pondoense</i> A.E.van Wyk	VU; PNCO (Protected)	Perennial	Shrub, tree
PROTEACEAE	<i>Leucadendron spissifolium</i> (Salisb. ex Knight) I.Williams subsp. <i>natalense</i> (Thode & Gilg) I.Williams	NT; PNCO (Protected)	Perennial	Dwarf shrub
PROTEACEAE	<i>Leucadendron spissifolium</i> (Salisb. ex Knight) I.Williams subsp. <i>oribinum</i> I.Williams	VU; PNCO (Protected)	Perennial	Dwarf shrub
PROTEACEAE	<i>Leucospermum innovans</i> Rourke	EN; PNCO (Protected)	Perennial	Shrub
PROTEACEAE	<i>Protea caffra</i> Meisn. subsp. <i>caffra</i>	LC; PNCO (Protected)	Perennial	Shrub, tree
PROTEACEAE	<i>Protea simplex</i> E.Phillips	LC; PNCO (Protected)	Perennial	Dwarf shrub, shrub
PSILOTACEAE	<i>Psilotum nudum</i> (L.) P.Beauv.	LC	Perennial	Epiphyte, herb, lithophyte
PTYCHOMITRIACEAE	<i>Ptychomitrium crispatum</i> (Hedw.) A.Jaeger		Perennial	Bryophyte
PUTRANJIVACEAE	<i>Drypetes arguta</i> (Müll.Arg.) Hutch.	LC	Perennial	Tree
PUTRANJIVACEAE	<i>Drypetes gerrardii</i> Hutch. var. <i>gerrardii</i>	LC	Perennial	Tree
RACOPIACEAE	<i>Racopilum capense</i> Müll.Hal. ex Broth.		Perennial	Bryophyte, epiphyte
RANUNCULACEAE	<i>Ranunculus multifidus</i> Forssk.		Perennial	Herb
RESTIONACEAE	<i>Restio paniculatus</i> Rottb.	LC	[No lifecycle defined]	[No lifeform defined]
RHAMNACEAE	<i>Colubrina nicholsonii</i> A.E.van Wyk & Schrire	VU	Perennial	Shrub, tree
RHAMNACEAE	<i>Phylica paniculata</i> Willd.	LC	Perennial	Shrub, tree
RHAMNACEAE	<i>Scutia myrtina</i> (Burm.f.) Kurz	LC	Perennial	Shrub, tree
RHIZOPHORACEAE	<i>Cassipourea gummiflua</i> Tul. var. <i>verticillata</i> (N.E.Br.) J.Lewis	VU*	Perennial	Tree
RHYNCHOCALYCEAE	<i>Rhynchochalyx lawsonioides</i> Oliv.	NT	Perennial	Tree
ROSACEAE	<i>Cliffortia odorata</i> L.f.	LC	Perennial	Shrub
ROSACEAE	<i>Cliffortia serpyllifolia</i> Cham. & Schldl.	LC	Perennial	Shrub
RUBIACEAE	<i>Alberta magna</i> E.Mey.	NT	Perennial	Tree

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
RUBIACEAE	<i>Anthospermum galpinii</i> Schltr.	LC	Perennial	Shrub
RUBIACEAE	<i>Anthospermum herbaceum</i> L.f.	LC	Perennial	Herb
RUBIACEAE	<i>Anthospermum hispidulum</i> E.Mey. ex Sond.	LC	Perennial	Dwarf shrub
RUBIACEAE	<i>Burchellia bubalina</i> (L.f.) Sims	LC	Perennial	Shrub, tree
RUBIACEAE	<i>Canthium inerme</i> (L.f.) Kuntze	LC	Perennial	Shrub, tree
RUBIACEAE	<i>Canthium vanwykii</i> Tilney & Kok	NT	Perennial	Shrub
RUBIACEAE	<i>Conostomium natalense</i> (Hochst.) Bremek. var. <i>glabrum</i> Bremek.	LC	Perennial	Herb
RUBIACEAE	<i>Gardenia thunbergia</i> L.f.	LC	Perennial	Shrub, tree
RUBIACEAE	<i>Hyperacanthus amoenus</i> (Sims) Bridson	LC	Perennial	Shrub
RUBIACEAE	<i>Keetia gueinzii</i> (Sond.) Bridson	LC	Perennial	Climber, shrub, tree
RUBIACEAE	<i>Mitriostigma axillare</i> Hochst.	LC	Perennial	Shrub, tree
RUBIACEAE	<i>Oldenlandia affinis</i> (Roem. & Schult.) DC. subsp. <i>fugax</i> (Vatke) Verdc.	LC	Perennial	Herb
RUBIACEAE	<i>Oldenlandia cephalotes</i> (Hochst.) Kuntze	LC	Perennial	Herb
RUBIACEAE	<i>Oldenlandia herbacea</i> (L.) Roxb. var. <i>herbacea</i>	LC	Annual (occ. perennial)	Herb
RUBIACEAE	<i>Oldenlandia rosulata</i> K.Schum. var. <i>rosulata</i>	LC	Annual	Herb
RUBIACEAE	<i>Oldenlandia rupicola</i> (Sond.) Kuntze var. <i>rupicola</i>	LC	Perennial	Herb
RUBIACEAE	<i>Oldenlandia tenella</i> (Hochst.) Kuntze	LC	Perennial	Herb
RUBIACEAE	<i>Pavetta bowkeri</i> Harv.	LC	Perennial	Shrub
RUBIACEAE	<i>Pavetta gracilifolia</i> Bremek.	LC	Perennial	Shrub
RUBIACEAE	<i>Pavetta inandensis</i> Bremek.	LC	Perennial	Shrub, tree
RUBIACEAE	<i>Pavetta revoluta</i> Hochst.	LC	Perennial	Shrub, tree
RUBIACEAE	<i>Pentanisia angustifolia</i> (Hochst.) Hochst.	LC	Perennial	Herb
RUBIACEAE	<i>Pentanisia prunelloides</i> (Klotzsch ex Eckl. & Zeyh.) Walp. subsp. <i>latifolia</i> (Hochst.) Verdc.	LC	Perennial	Herb
RUBIACEAE	<i>Psychotria capensis</i> (Eckl.) Vatke subsp. <i>capensis</i> var. <i>capensis</i>	LC	Perennial	Shrub, tree
RUBIACEAE	<i>Psydrax obovata</i> (Eckl. & Zeyh.) Bridson subsp. <i>obovata</i>	LC	Perennial	Tree
RUBIACEAE	<i>Rothmannia globosa</i> (Hochst.) Keay	LC	Perennial	Tree
RUBIACEAE	<i>Spermacoce natalensis</i> Hochst.	LC	Perennial	Herb

Ecological Impact Assessment – October 2016

Family	Species	Threat status	Lifecycle	Growth forms
RUBIACEAE	<i>Tarenna pavetoides</i> (Harv.) Sim subsp. <i>pavetoides</i>	LC	Perennial	Shrub, tree
RUBIACEAE	<i>Tricalysia africana</i> (Sim) Robbr.	EN	Perennial	Shrub, tree
RUBIACEAE	<i>Tricalysia capensis</i> (Meisn. ex Hochst.) Sim var. <i>capensis</i>	LC	Perennial	Shrub, tree
RUBIACEAE	<i>Tricalysia lanceolata</i> (Sond.) Burt Davy	LC	Perennial	Shrub, tree
RUTACEAE	<i>Agathosma ovata</i> (Thunb.) Pillans	LC	Perennial	Dwarf shrub, shrub
RUTACEAE	<i>Clausena anisata</i> (Willd.) Hook.f. ex Benth. var. <i>anisata</i>	LC	Perennial	Shrub, tree
SALICACEAE	<i>Pseudoscopia polyantha</i> Gilg	NT	Perennial	Shrub, tree
SALICACEAE	<i>Trimeria grandifolia</i> (Hochst.) Warb. subsp. <i>grandifolia</i>	LC	Perennial	Shrub, tree
SANTALACEAE	<i>Osyridicarpus schimperianus</i> (Hochst. ex A.Rich.) A.DC.	LC	Perennial	Shrub
SANTALACEAE	<i>Osyris compressa</i> (P.J.Bergius) A.DC.	LC	Perennial	Shrub
SANTALACEAE	<i>Thesium acutissimum</i> A.DC.	LC	Perennial	Herb, parasite, shrub
SANTALACEAE	<i>Thesium asterias</i> A.W.Hill	LC	Perennial	Dwarf shrub
SANTALACEAE	<i>Thesium natalense</i> Sond.	LC	Perennial	Herb, parasite
SANTALACEAE	<i>Thesium pallidum</i> A.DC.	LC	Perennial	Herb, parasite, shrub
SAPINDACEAE	<i>Allophylus natalensis</i> (Sond.) De Winter	LC	Perennial	Shrub, tree
SAPOTACEAE	<i>Mimusops caffra</i> E.Mey. ex A.DC.	LC	Perennial	Shrub, tree
SAPOTACEAE	<i>Mimusops obovata</i> Nees ex Sond.	LC	Perennial	Shrub, tree
SAPOTACEAE	<i>Sideroxylon inerme</i> L. subsp. <i>inerme</i>	LC	Perennial	Shrub, tree
SCHIZAEACEAE	<i>Schizaea pectinata</i> (L.) Sw.	LC	Perennial	Geophyte, herb, lithophyte
SCROPHULARIACEAE	<i>Anastrabe integerrima</i> E.Mey. ex Benth.	LC	Perennial	Scrambler, shrub, tree
SCROPHULARIACEAE	<i>Dermatobotrys saundersii</i> Bolus ex Oliv.	LC	Perennial	Dwarf shrub, epiphyte, shrub
SCROPHULARIACEAE	<i>Diascia racemulosa</i> Benth.	LC; PNCO (Protected)	Annual	Herb
SCROPHULARIACEAE	<i>Hebenstretia dura</i> Choisy	LC	Perennial	Dwarf shrub, shrub
SCROPHULARIACEAE	<i>Nemesia denticulata</i> (Benth.) Grant ex Fourc.	LC	Perennial	Herb
SCROPHULARIACEAE	<i>Selago peduncularis</i> E.Mey.	LC	Perennial	Herb
SCROPHULARIACEAE	<i>Teedia lucida</i> (Sol.) Rudolphi	LC	Perennial	Dwarf shrub, herb,



Ecological Impact Assessment – October 2016

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			(occ. annual)	shrub
SCROPHULARIACEAE	<i>Zaluzianskya angustifolia</i> Hilliard & B.L.Burt	LC	Perennial	Herb
SCROPHULARIACEAE	<i>Zaluzianskya elongata</i> Hilliard & B.L.Burt	LC	Perennial	Herb
SELAGINELLACEAE	<i>Selaginella dregei</i> (C.Presl) Hieron.	LC	Perennial	Geophyte, herb, lithophyte
SINOPTERIDACEAE	<i>Cheilanthes viridis</i> (Forssk.) Sw. var. <i>glauca</i> (Sim) Schelpe & N.C.Anthony	LC	Perennial	Geophyte, herb, lithophyte
SINOPTERIDACEAE	<i>Cheilanthes viridis</i> (Forssk.) Sw. var. <i>macrophylla</i> (Kunze) Schelpe & N.C.Anthony	LC	Perennial	Geophyte, herb
SINOPTERIDACEAE	<i>Cheilanthes viridis</i> (Forssk.) Sw. var. <i>viridis</i>	LC	Perennial	Geophyte, herb, lithophyte
SINOPTERIDACEAE	<i>Pellaea calomelanos</i> (Sw.) Link var. <i>calomelanos</i>	LC	Perennial	Geophyte, herb, lithophyte
SMILACACEAE	<i>Smilax anceps</i> Willd.	LC	Perennial	Climber, shrub
SPHAGNACEAE	<i>Sphagnum truncatum</i> Hornsch.		Perennial	Bryophyte, hydrophyte
STANGERIACEAE	<i>Stangeria eriopus</i> (Kunze) Baill.	VU; NEMBA (Vulnerable)	Perennial	Geophyte, herb
STEREOPHYLLACEAE	<i>Stereophyllum radiculosum</i> (Hook.) Mitt.		Perennial	Bryophyte, epiphyte
THELYPTERIDACEAE	<i>Amauropelta bergiana</i> (Schltdl.) Holttum var. <i>bergiana</i>	LC	Perennial	Geophyte, herb, lithophyte
THELYPTERIDACEAE	<i>Cyclosorus interruptus</i> (Willd.) H.Itô	LC	Perennial	Herb, hydrophyte
THEOPHRASTACEAE	<i>Samolus porosus</i> (L.f.) Thunb.	LC	Perennial	Herb, hydrophyte
THYMELAEACEAE	<i>Englerodaphne ovalifolia</i> (Meisn.) E.Phillips	LC	Perennial	Shrub
THYMELAEACEAE	<i>Gnidia anthylloides</i> (L.f.) Gilg	LC	Perennial	Dwarf shrub, shrub
THYMELAEACEAE	<i>Gnidia kraussiana</i> Meisn. var. <i>kraussiana</i>	LC	Perennial	Dwarf shrub, shrub
THYMELAEACEAE	<i>Gnidia myrtifolia</i> C.H.Wright	LC	Perennial	Dwarf shrub, herb
THYMELAEACEAE	<i>Gnidia nodiflora</i> Meisn.	LC	Perennial	Dwarf shrub, shrub
THYMELAEACEAE	<i>Gnidia styphelioides</i> Meisn.	LC	Perennial	Dwarf shrub, shrub
THYMELAEACEAE	<i>Gnidia wilmsii</i> (C.H.Wright) Engl.	LC	Perennial	Shrub
THYMELAEACEAE	<i>Gnidia woodii</i> C.H.Wright	LC	Perennial	Dwarf shrub

Ecological Impact Assessment – October 2016

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THYMELAEACEAE	<i>Passerina montivaga</i> C.L.Bredenkamp & A.E.van Wyk	LC	[No lifecycle defined]	[No lifeform defined]
THYMELAEACEAE	<i>Passerina rigida</i> Wikstr.	LC	Perennial	Dwarf shrub, shrub
THYMELAEACEAE	<i>Peddiea africana</i> Harv.	LC	Perennial	Shrub, tree
THYMELAEACEAE	<i>Struthiola pondoensis</i> Gilg ex C.H.Wright	LC	Perennial	Shrub
VERBENACEAE	<i>Phyla nodiflora</i> (L.) Greene var. <i>nodiflora</i>	Not Evaluated	Perennial	Herb
VIOLACEAE	<i>Hybanthus enneaspermus</i> (L.) F.Muell. var. <i>enneaspermus</i>	Not Evaluated	Perennial	Herb
VIOLACEAE	<i>Rinorea angustifolia</i> (Thouars) Baill. subsp. <i>natalensis</i> (Engl.) Grey-Wilson	LC	Perennial	Shrub, tree
VITACEAE	<i>Cissus fragilis</i> E.Mey. ex Kunth	LC	Perennial	Climber
VITACEAE	<i>Cyphostemma hypoleucum</i> (Harv.) Desc. ex Wild & R.B.Drumm.	LC	Perennial	Climber, succulent
VITACEAE	<i>Rhoicissus digitata</i> (L.f.) Gilg & M.Brandt	LC	Perennial	Climber
VITACEAE	<i>Rhoicissus tridentata</i> (L.f.) Wild & R.B.Drumm. subsp. <i>cuneifolia</i> (Eckl. & Zeyh.) Urton	Not Evaluated	Perennial	Climber
VITACEAE	<i>Rhoicissus tridentata</i> (L.f.) Wild & R.B.Drumm. subsp. <i>tridentata</i>	Not Evaluated	Perennial	Shrub
VITTARIACEAE	<i>Vittaria isoetifolia</i> Bory	LC	Perennial	Epiphyte, herb
XYRIDACEAE	<i>Xyris natalensis</i> L.A.Nilsson	LC	Perennial	Helophyte, herb, hydrophyte
ZAMIACEAE	<i>Encephalartos altensteinii</i> Lehm.	VU; NEMBA (Vulnerable)	Perennial	Tree
ZAMIACEAE	<i>Encephalartos villosus</i> Lem.	LC; NEMBA (Protected)	Perennial	Dwarf shrub, geophyte, shrub