



*SPECIALIST REPORT*

**Ecological Assessment:  
The proposed clearing of indigenous vegetation on  
Ptn 1 Boblands 247JU and Ptn 3, Weltevreden 229JU,  
City of Mbombela**

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## **Specialist declaration**

I, Danie van der Walt, declare that -

- I act as an independent specialist in this application;
- I have performed 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;
- I have expertise in conducting the specialist report relevant to this application, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the relevant environmental legislation, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in this project;
- I undertake to disclose to the applicant and the authorities 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.

L.D. VAN DER WALT

Date: 2017-03-13

## EXECUTIVE SUMMARY

The applicant plans to establish cultivated lands on the property, specifically on agriculture lands that have lain fallow for more than 10 years. As indigenous vegetation is now established on the proposed lands, environmental authorization is necessary for the clearing of this vegetation. As part of the EIA process a biodiversity assessment was recommended by the environmental consultant and Afrika Enviro & biology was appointed to do this assessment.

On a National level, the larger study area can be classified as Lowveld (A10) or Sour Lowveld Bushveld. Classified on a regional scale and according to a more detailed system the site is classified as Malelane Mountain Bushveld (SVI11). This veld type is rated as least threatened as it is well protected (45% formally protected in the Kruger National Park and Mthethomusha Provincial Nature Reserve). Approximately 4% is transformed due to agriculture, urban sprawl and roads infrastructure. According to the Mpumalanga Biodiversity Sector Plan (MBSP) the project area is located on heavily and moderately modified land. Furthermore, the area is located within 5km of a Protected Area.

The property is located along the Blinkwaterspruit in the mountainous area to the east of Nelspruit. Access to the site (and the other farms in the valley) is gained via a gravel access road that roughly follows the eastern side of the Blinkwaterspruit. Three sites are proposed, site 1 (6Ha) is located to the west of the road and the site 2 (13Ha) and site 3 (10.5Ha) is located to the east of the road. A tributary of the Blinkwaterspruit forms a prominent valley to the north of both sites. Both the sites are located on the eastern valley slope the Blinkwaterspruit. No wetlands or rocky outcrops are present on the proposed sites.

The sensitivity zoning (based upon natural integrity, fauna potential and ecological functions) for the different ecological communities are summarized as follows:

<b>Vegetation Community</b>	<b>Sensitivity Rating</b>
Riparian habitat	High
Natural woodland	Medium - High
Old agri-lands	Low

The single most important impact on biodiversity as consequence of transforming virgin land to agriculture is the loss of vegetation and loss and fragmentation of natural habitats and consequently the loss of fauna. However, the proposed sites that are located on old lands (Site 1; Site 2) do not comprise virgin land and the abovementioned impacts have already occurred in the historic past and the use of these sites will not have a highly significant impact on the natural environment.

Site 3 comprises natural woodland and the proposed activity will result in a loss of vegetation and natural habitat. This activity will be highly significant on site level but as this habitat type is well represented locally and regionally it can be reasoned that this impact will be of medium significance locally and medium-low significance regionally. Furthermore, no threatened or RDL biota was recorded on the site and the ecosystem type (Malelane Mountain Bushveld) is classified as Least threatened.

For these reasons it is not anticipated that the proposed activity will have major negative consequences for the natural environment or the integrity of the land in the local area. The property is located outside of the Nature Reserve to the south where the applicant also owns land that can be viewed as an alternative site where this activity would not be recommended as it would have a significant impact on the integrity of the Nature Reserve. For the same reasons, it is not anticipated that the proposed activity will compromise the integrity of the ecological support areas or the nearby Nature Reserve.

The biodiversity assessment concludes that the proposed activity located on site 3 will result in a loss of vegetation and natural habitat. This activity will be highly significant on site level but as this habitat type is well represented locally and regionally it can be reasoned that this impact will be of medium significance locally and medium-low significance regionally. Furthermore, the property is located

outside of the Nature Reserve to the south where the applicant also owns land that can be viewed as an alternative site where this activity would not be recommended as it would have a significant impact on the integrity of the Nature Reserve.

However, important natural communities remain intact (riparian zones) adjacent to the proposed development sites- it is recommended that these natural areas should be conserved to ensure that the present state of biodiversity is not affected and that the layout plan be designed to conserve these areas. Furthermore, the following mitigation measures and recommendations should be adhered to:

#### **General recommendations**

The layout must be planned to accommodate the following:

- Planned along the recommended development areas as projected;
- Conserve natural habitats and minimize loss of biodiversity;
- Retain large indigenous trees on site where possible.
- Use only indigenous flora for landscaping.
- Implement an alien invader vegetation control program.
- Spoil material may not be pushed / stockpiled into the surrounding natural habitats or buffer zones.

#### **Buffer zones**

- A 10m buffer zone is recommended to protect the riparian habitat. This buffer line is calculated from the edge of the relevant habitat.
- The applicant must take note that the delineations on the map have been accurately performed with the aid of a georeferenced aerial photograph and a GIS program. The results conclude that the recommended areas (delineated with a red line) are sufficient for the proposed activities. It is therefore not necessary to disturb land beyond the buffer line in order to achieve the objective surface area for cultivation, a fence and a firebreak.
- It is recommended that an Environmental Control Officer (ECO) is appointed who will be responsible to actually delineate the buffer zone on site (considering actual on site conditions and to ensure that large trees are not destroyed for this purpose).
- Spoil material may not be pushed / stockpiled into the buffer zone or riparian zones.

## Executive Summary

### 1. Introduction

- 1.1 Background and objectives
- 1.2 Specialist report requirements

### 2. Survey Methods and Reporting

- 2.1 Assumptions, uncertainties and limitations
- 2.2 General
- 2.3 Vegetation & habitats
- 2.4 Terrestrial Fauna
- 2.5 Watercourse classification & delineation
- 2.6 Ecological importance and sensitivity rating of habitats

### 3. Background Information

- 3.1 Biophysical description of the study area
- 3.2 Ecology & biodiversity
- 3.3 Conservation & importance

### 4. Vegetation & habitat report and general biophysical descriptions

- 4.1 General site description and land uses
- 4.2 Habitats & vegetation
- 4.3 Occurrence of important flora species

### 5. Terrestrial Fauna Report

### 6. Discussion and Impact assessment

### 7. Conclusion & Recommendations

### 8. References

## APPENDIXES

- APPENDIX 1: SPECIALIST DETAILS
- APPENDIX 2: MAPS

## **1. Introduction**

### **1.1 Background and objectives**

The applicant plans to establish cultivated lands on the property, specifically on agriculture lands that have lain fallow for more than 10 years. As indigenous vegetation is now established on the proposed lands, environmental authorization is necessary for the clearing of this vegetation. As part of the EIA process a biodiversity assessment was recommended by the environmental consultant and Afrika Enviro & biology was appointed to do this assessment. The terms are as follows:

- Biodiversity and habitat assessment;
- Sensitivity and habitat delineation;
- Recommendations.

The site was investigated on 2017-03-13 and 2017-05-24.

### **1.2 Specialist report requirements**

With reference to Appendix 6 of the EIA regulations (2014) the specialist declaration is included on page 2 of this report and details and the specialist's curriculum vitae are included with Appendix 1.

## **2. Methods and Reporting**

### **2.1 Assumptions, uncertainties and limitations**

The results and recommendations of the report are based on the actual site status. Assumptions that are made and uncertainties that are encountered are indicated in the report (where applicable). As indicated under the relevant sections in the report consultation of authorities' data bases forms part of this report. However, the scope of work for this specialist report does not include public participation.

The author is confident that the results obtained by the present study are of significance to make conclusions and recommendations regarding the subjects that were investigated. The faunal survey was not a comprehensive specialist survey but rather an overview of the available habitats and their potential to be utilized by fauna. No nocturnal surveys were conducted.

### **2.2 General**

The author relied on aerial images and ortho photos to remotely assess the site before the actual on site investigation in order to get familiarized with the different features and vegetation communities (habitats) present within the affected areas. The information thus gathered was used for selecting survey sites and to identify possible sensitive areas. Problematic, as well as potential sensitive areas were identified during the site assessment and these were thoroughly investigated as explained in the following two sections. All literature and other references used to support findings and to assist in making conclusions are listed.

## 2.2 Vegetation

Floral diversity was determined by completing survey transects and sample sites along all the different habitats within the physiographic zones represented in the study area (Deal *et al.* 1989a). In order to attain scientifically reliable results, obviously distinct vegetation communities were surveyed by selecting representative sites in each homogenous unit (Mathews *et al.* 1992). The vegetation units of Mucina & Rutherford (2006) are used as reference but where necessary communities are described according to a unit's diagnostic floral features and/or topographical setting or other biophysical features (or a combination of several descriptive features). By combining the available literature with the survey results, stratification of vegetation communities was possible.

The survey transects and sites in the affected areas were also intensively searched for important species and the potential for Red Data Listed (RDL) and other important species were established and cross referenced with PRECIS Data for the relevant quarter degree grid/s as obtained from the SANBI data base (POSA). The aim was to identify distinct vegetation types and to establish their integrity and representation in the study area. The vegetation communities/habitats are described in section 4, and the POSA list of expected flora for this grid is included with Appendix 4 of this report.

## 2.3 Terrestrial Fauna

The fauna investigation is based on a desktop study verified by cross reference with available habitats of the study area, so as to establish the faunal potential of a particular site. Selected survey sites were well searched for fauna and habitats were identified during the vegetation surveys so as to establish the faunal potential of a particular area. By method of elimination (based on available habitats and the taxon's biology and known distribution), lists of faunal representation for the study area was assembled.

## 2.4 Wetland and riparian delineation

It is important to differentiate between wetlands and riparian habitats. Riparian zones are not wetlands, however, depending on the ecosystem structure; wetlands can also be classified as riparian zones if they are located in this zone (e.g. valley bottom wetlands). Although these distinct ecosystems will be interactive where they occur in close proximity it is important not to confuse their hydrology and ecofunctions. For these reasons the results are reported in separate sections under specific headings.

These delineations are performed according to "*A practical field procedure for identification and delineation of wetlands and riparian areas*" as amended and published by the Department of Water Affairs and Forestry (2005); (Henceforth referred to as DWAF Guidelines (2005)). Aerial photographs and land surveys were used to determine the different features and potential wetland and riparian areas of the study area. Vegetation diversity and assemblages were determined by completing survey transects along all the different vegetation communities identified in the riparian areas.

## 2.5 Ecological importance and sensitivity rating of habitats

By considering the results of all the above investigations, the authors allocate a qualitative sensitivity rating to the habitats that were identified, based upon its ecological importance and biodiversity value. A qualitative method was chosen at the first stage of assessment instead of a quantitative method in order to simplify the procedure of assessment.

This method of assessment is based on the criteria used by DWAF for *river ecoclassification* (Kleynhans *et al.*, 2009) and *a technique for assessing wetland health* (Macfarlane *et al.*, 2005). In order to simplify the decision making process, a scale of *Low, Medium, High* and *Very High* is used, based upon biodiversity value and ecological functions (Table 1). This method is used as a first level of expressing the sensitivity of a specific component and is not used in comparative assessments of alternatives where a quantitative approach will be more appropriate. Wetland sensitivity is measured only on its maintenance of biodiversity function at this basic level of assessment.

Table 1 Criteria used for sensitivity rating of habitats

Ecological Importance/Biodiversity Value	Sensitivity Rating
<b>Terrestrial and Riparian Communities</b>	
Natural communities (habitats and ecosystems) that are regarded as pristine or largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged and the community is regarded as very important for the maintenance of biodiversity and rare and important taxa are present (e.g. occurrence of RDL, Endemic and/or Protected species). The local area is an important ecological support area and any external impacts will have a significant negative effect on its status.	<i>Very High</i>
Natural communities (habitats and ecosystems) which are regarded as ecologically important and sensitive and important for the maintenance of biodiversity. It may be linked to other important communities and provide an important refuge/corridor for biodiversity (fauna and flora). This rating can also be allocated due to the presence of one or more unique qualities (e.g. occurrence of RDL, Endemic and/or Protected species). The presence of unnatural impacts is low and can be managed.	<i>High</i>
Natural communities which have a limited ecological function and a limited function for maintaining biodiversity. This may be due to homogenous habitat conditions and/or the negative effects of external impacts. External impacts can be managed and mitigated to reduce the significance of their magnitude.	<i>Medium</i>
Communities which have been significantly modified or transformed with the result that little or no natural flora and habitats remain intact. Ecological importance as well as biodiversity value is low. External impacts will not have a significant impact on its status.	<i>Low</i>

This method is used as a first level of expressing the sensitivity of a specific component and is not used in comparative assessments of alternatives where a quantitative approach will be more appropriate. Furthermore, it should be noted that the above method is used only at this (first) level for the sensitivity rating of wetlands in this report. A wetland ecological status and integrity assessment is based on quantitative variables and is not covered under the terms and scope of work for this report and this report is not intended to replace or contradict the findings and recommendations of specialist wetland assessments completed for this land.



### 3. Background Information

#### 3.1 Biophysical description of the study area

The general study area consists of plains bushveld typical of the eastern Lowveld. The most serious transformation of the natural environment consists of cultivation of crops and formal and informal settlements which have transformed significant areas of natural land in the past few years.

The general geology of the area consists of granite and gneiss, mostly of the Nelspruit suite, forming hills with large boulders. Soils are shallow, coarse lithosols, comprised of Glenrosa or Mispah soil types.

A typical Lowveld climate prevails with seasonal summer-rainfall, warm temperatures and dry winters. MAP ranging between 550mm and 800mm (increasing with altitude). Frost is infrequent.

#### 3.2 Ecology & biodiversity

On a National level, the larger study area can be classified as Lowveld (A10), according to Acocks (1988) and Sour Lowveld Bushveld according to Low & Rebelo (1998). Classified on a regional scale and according to a more detailed system the site is classified as Malelane Mountain Bushveld (SVI11); (Mucina & Rutherford, 2006). This veld type is rated as *Least threatened* as it is well protected (45% formally protected in the Kruger National Park and Mthethomusha Provincial Nature Reserve). Approximately 4% is transformed due to agriculture, urban sprawl and roads infrastructure (Mucina & Rutherford, 2006). A description of this vegetation type follows:

**Malelane Mountain Bushveld** is found on the mountains and hills to the east of Nelspruit in an area known as the Krokodilpoort Mountains. It consists of open to closed savannah depending on the altitude and measure of protection. This veld type is characterized by the trees *Pterocarpus angolensis* and *Dombeya rotundifolia* and under natural conditions it occurs with few shrubs present. It is related to Legogote Sour Bushveld. It is well protected (45% formally protected) and 4% is transformed and as such is classified as *Least threatened*.

#### 3.3 Conservation & Importance

The Mpumalanga Biodiversity Sector Plan (MBSP); (MTPA, 2014) ratings for the terrestrial and freshwater ecology of the project area are projected in Appendix 2. According to the MBSP the project area is located on heavily and moderately modified land. Furthermore, the area is located within 5km of a Protected Area.

One of the objectives of this report is to verify and investigate the abovementioned aspects and to provide recommendations and buffer zones where applicable.

## 4. Vegetation & habitat report and general biophysical descriptions

### 4.1 General site description and land uses

The property is located along the Blinkwaterspruit in the mountainous area to the east of Nelspruit. Access to the site (and the other farms in the valley) is gained via a gravel access road that roughly follows the eastern side of the Blinkwaterspruit. Three sites are proposed, site 1 (6Ha) is located to the west of the road and the site 2 (13Ha) and site 3 (10.5Ha) is located to the east of the road. A tributary of the Blinkwaterspruit forms a prominent valley to the north of both sites. All the sites are located on the eastern valley slope the Blinkwaterspruit. Terrestrial habitat varies from natural woodland and riparian areas to old agricultural lands (old agri-lands). No wetlands or rocky outcrops are present on the proposed sites. Historical Google imagery indicate that the old-agri lands have not been cultivated or tilled during the past 10 years and is presently vegetated by indigenous vegetation, therefore these areas qualifies as **indigenous vegetation** as defined by the EIA Regulations (2014). The biophysical features and habitat delineation of the study sites are projected on an aerial image (Figure. 1). Illustrations of the environment and vegetation are included with the following sections.

### 4.2 Habitats & vegetation

The vegetation communities present on and near to the proposed activity sites are classified according to simplified biophysical descriptions and discussed in the following sections:

#### i) Indigenous vegetation on old agri-lands

(Site 1=5.8Ha; Site 2=13.2Ha; Total 19Ha)

This area consists of the two sites described in the previous section and was historically under cultivation which means that the natural vegetation was cleared in order to prepare the lands for agriculture. Of the natural historic vegetation only a few solitary large trees were preserved (Figure 1). Presently, the vegetation covering this community is the result of secondary growth and the establishment pioneer species. The vegetation of most of the old lands is dominated by pioneer grasses but pioneer woody vegetation is well established on sections that have been fallow for a much longer period of time.



The indigenous vegetation on the old lands consist of pioneer species and the structure varies from pioneer grassland dominated by grasses and shrubs to thickets dominated by Acacia and Sickle bush

The grass covered sections of both sites are dominated by the grasses *Hyperthelia dissoluta*, *Cynodon dactylon*, *Cynodon nlemfuensis* and *Sporobolus panicoides*. Dominant pioneer forbs and shrubs include *Lippia javanica*, *Diospyros lycioides* subsp. *sericea*, *Acacia karroo*, *Acacia nilotica* and *Dichrostachys cinerea*. In certain places, shrubs and trees consisting of these species form dense thickets. Large trees are limited to secondary growth *Acacia karroo* individuals (pioneers) and large solitary specimens of Marula (*Sclerocarya birrea*) and the wild fig (*Ficus sycomorus*). The large specimens of the last two mentioned species are remnants of the original natural vegetation. Marula trees are also well represented in the surrounding natural woodland and it will not have a significant ecological impact if these trees are removed. However, it is recommended that the large *Ficus sycomorus* specimen on site 2 is conserved as it is of ecological importance as a source of food to many species of animals. No Red Data Listed fauna or vegetation was recorded and the biodiversity importance and ecological functions of these sites are **Low**.

ii) **Natural woodland** (Site 3=10.5Ha)

The area to the south and east of site 2 is naturally vegetated and the structure varies from shrubs to medium and large trees. Trees and shrubs recorded in this woodland are *Acacia karroo*, *Acacia nilotica*, *Schotia brachypetala*, *Ziziphus mucronata*, *Sclerocarya birrea*, *Dombeya autumnalis*, *Pterocarpus rotundifolius*, *Rhus lancea*, *Combretum zeyherii*, *Gymnosporia spp*, *Pappea capensis*, *Cussonia spicata*, *Euclea divinorum*, *Euphorbia ingens* and *Peltophorum africanum*. It is evident that bush encroachment is taking place as large areas are invaded by *Dichrostachys cinerea* and *Acacia karroo* thickets. The magnitude of the bush encroachment is quite severe and is even noticeable on historic Google imagery since 2004. No Red Data Listed (RDL) flora was recorded in this section.

Species diversity in this community can be considered to be medium-high and the ecological functions in this habitat will be of local importance. The ecological importance and sensitivity are therefore rated as **High**.



The natural woodland includes a diverse range of trees and shrubs and provide habitat to a large range of fauna

### iii) Riparian zones

The primary riparian zone is fragmented as result of the loss of vegetation in the past as consequence of agriculture practices. *Combretum hereroense*, *Acacia karroo* and *Berchemia zeyherii* are dominant and other species present are *Celtis africana*, *Schotia brachypetala*, *Peltophorum africanum*, *Sclerocarya birrea* *Croton megalobotrys*, *Rhus rehmanniana* *Ziziphus mucronata*, *Trema orientalis* and *Rhus lancea*. Understory shrubs and climbers that are present are *Ochna natalita*, *Euclea natalensis*, *Diospyros lycioides*, *Isoglossus sp*, *Rhamnus prinoides*, *Rhoicissus tridentata* and *Bauhinia galpinii*. No RDL species were recorded.

This reach of riparian vegetation is very important due to the habitat that is created / provided and it provides an ecological corridor and refuge. Any disturbance thereof will result in significant negative impacts including loss of large trees, fragmentation of habitat and invasion by alien and invasive vegetation. This primary riparian zone has very important stabilizing and ecological functions and has a **Medium - High** sensitivity rating. A 10m buffer zone is recommended as protection around these areas.



The riparian habitat along the Blinkwaterspruit provides refuge and a corridor for fauna as well as important morphological functions

### 4.3 Occurrence of important flora species

Conservation-important, naturally occurring species can be categorized according to specific features that are important, usually due to rarity, habitat specificity, medicinal value, ecological value, endemism, over-exploitation, economic value or a combination of these. Species of conservation importance are either categorized as Red Data Listed species (RDL species), according to specific scientifically researched criteria and administered by the South African National Biodiversity Institute (SANBI), or as Protected Trees and Plants by the national forests and the provincial nature conservation legislation. The National List for Red Data flora (2007) is the most updated and applicable reference for vegetation conservation in Mpumalanga. Applicable legislation that protect flora in South Africa and specifically in Mpumalanga Province are the National Environmental Management Biodiversity Act of 2004 (NEMBA), the Mpumalanga Nature Conservation Act of 1998 (MNCA) and the National Forests Act of 1998 (NFA).



No RDL species was recorded and two legally protected tree species were identified: *Sclerocarya birrea ssp caffra* and *Berchemia zeyheri*. Permits will have to be obtained from the Department of Forestry, and/or the Mpumalanga Tourism and Parks Agency, if legally protected trees or plant species are to be removed or destroyed. No RDL species were identified on the affected area (Table 2).

Table 2 National RDL species potential for the relevant quarter degree grid (2531DA)

Species	National Status	Habitat preference
<i>Acridocarpus natalitius</i>	Near threatened	Forest, thickets, outcrops, drainage lines.
<i>Adenia gumnifera</i>	Declining	Bushveld habitats. Outcrops.
<i>Aloe kniphofioides</i>	Near threatened	Grassland habitats.
<i>Aloe simii</i>	Critically endangered	Tall, open grassland. Above altitude 900m
<i>Ansellia africana</i>	Declining	Bushveld, epiphyte
<i>Boophane disticha</i>	Near threatened	Prefers higher altitude grassland.
<i>Brachystelma chlorozonum</i>	Vulnerable	Bushveld habitats.
<i>Crinum macowanii</i> Baker	Declining	Riparian and moist areas
<i>Elaeodendron transvaalense</i>	Near Threatened	Expected in natural bushveld;
<i>Encephalartos laevifolius</i>	Critically endangered	Prefers higher altitude grassland.
<i>Eriosema naviculare</i>	Endangered	Expected in natural bushveld;
<i>Hypoxis hemerocallidea</i>	Declining	Prefers higher altitude grassland.
<i>Ilex mitis</i> var. <i>mitis</i>	Declining	Forest, thicket and riparian areas
<i>Siphonochilus aethiopicus</i>	CR	Forests

Also of conservation importance is the occurrence of alien invasive species and weeds. Such species are listed in the Conservation of Agricultural Resources Act of 1983 (CARA) and the Mpumalanga Conservation Act (1998). The areas on site 2 and site 3 where *Dichrostachys cinerea* and *Acacia spp* has formed thickets can be classified as bush encroachment and has to be managed according to CARA.

## 5. Terrestrial Fauna Report

As the main anticipated impact on the environmental environment will not result in the loss or fragmentation of natural habitat, a comprehensive fauna assessment was not deemed necessary. It is obvious that the natural terrestrial habitats of the proposed two sites has been completely transformed to cultivated lands in the historic past but has not been cultivated for the past number of years. However, the remaining natural habitat (riparian habitat and natural woodland) provides very important refuge for flora and fauna and the riparian habitat is of high importance for fauna as it provides refuge and a corridor that enables animals to move about the larger study area and to migrate in between adjacent terrestrial habitats that are connected by way of this corridor. These habitats will not be directly affected by the proposed activities and will be protected by a buffer zone.

The old agri-lands provide limited habitat or function for fauna and the transformation to tree lined orchards will not pose a large change to fauna. The loss of the natural woodland will have a negative effect on local fauna, especially birds and reptiles will be affected. No raptor's or large bird's nests were observed in any of the larger trees

that will be lost. This fact was affirmed by the owner who is a keen naturalist and is knowledgeable about raptor nests that are present in the local area.

As it is a relatively small portion of woodland that will be lost (10.5Ha) it should not affect large animals (mammals) to a large degree as this portion will not support a large number of individual large animals and these will already be limited due to the bush encroachment in this habitat.

## 6. Discussion and Impact Assessment

### 6.1 Sensitivity rating

The sensitivity zoning (based upon natural integrity, fauna potential and ecological functions) for the different ecological communities are delineated in Fig. 1 and summarized as follows:

Vegetation Community	Sensitivity Rating
Riparian habitat	High
Natural woodland	Medium - High
Old agri-lands	Low

### 6.2 Impact assessment

The single most important impact on biodiversity as consequence of transforming virgin land to agriculture is the loss of vegetation and loss and fragmentation of natural habitats and consequently the loss of fauna. However, the proposed sites that are located on old lands (Site 1; Site 2) do not comprise virgin land and the abovementioned impacts have already occurred in the historic past and the use of these sites will not have a highly significant impact on the natural environment.

Site 3 comprises natural woodland and the proposed activity will result in a loss of vegetation and natural habitat. This activity will be highly significant on site level but as this habitat type is well represented locally and regionally it can be reasoned that this impact will be of medium significance locally and medium-low significance regionally. Furthermore, no threatened or RDL biota was recorded on the site and the ecosystem type (Malelane Mountain Bushveld) is classified as *Least threatened*. A large number of protected Marula trees (*Sclerocarya birrea*) will be destroyed when the site is cleared. As mitigation, the applicant can replant a similar number of these trees alongside fence and roads where they will not be affected in future. It should also be considered that a large amount of the natural vegetation that will be lost actually constitutes bush encroachment and the loss of these areas will not be of high significance.

For these reasons it is not anticipated that the proposed activity will have major negative consequences for the natural environment or the integrity of the land in the local area. The property is located outside of the Nature Reserve to the south where the applicant also owns land that can be viewed as an alternative site where this activity would not be recommended as it would have a significant impact on the integrity of the Nature Reserve. For the same reasons, it is not anticipated that the

proposed activity will compromise the integrity of the ecological support areas or the nearby Nature Reserve.

Recommendations and mitigation measures in order to ensure that potential impacts are minimized are discussed in the following section.

## **7. Conclusion and Recommendations**

The biodiversity assessment concludes that the proposed activity located on site 3 will result in a loss of natural indigenous vegetation and natural habitat. This activity will be highly significant on site level but as this habitat type is well represented locally and regionally it can be reasoned that this impact will be of medium significance locally and medium-low significance regionally. Furthermore, the property is located outside of the Nature Reserve to the south where the applicant also owns land that can be viewed as an alternative site where this activity would not be recommended as it would have a significant impact on the integrity of the Nature Reserve.

However, important natural communities remain intact (riparian zones) adjacent to the proposed development sites- it is recommended that these natural areas should be conserved to ensure that the present state of biodiversity is not affected and that the layout plan be designed to conserve these areas. Furthermore, the following mitigation measures and recommendations should be adhered to (Refer also to Figure. 1).

### **General recommendations**

The layout must be planned to accommodate the following:

- Planned along the recommended development areas as projected in Figure 1;
- Conserve natural habitats and minimize loss of biodiversity;
- Retain large indigenous trees on site where possible.
- Plant Marula trees as mitigation to make good the loss of trees when the site is cleared.
- Use only indigenous flora for landscaping.
- Implement an alien invader vegetation control program.
- Spoil material may not be pushed / stockpiled into the surrounding natural habitats or buffer zones.

### **Buffer zones**

- A 10m buffer zone is recommended to protect the riparian habitat. This buffer line is calculated from the edge of the relevant habitat.
- The applicant must take note that the delineations on the map have been accurately performed with the aid of a georeferenced aerial photograph and a GIS program. The results conclude that the recommended areas (delineated with a red line in Figure 1) are sufficient for the proposed activities. It is therefore not necessary to disturb land beyond the buffer line in order to achieve the objective surface area for cultivation, a fence and a firebreak.

- It is recommended that an Environmental Control Officer (ECO) is appointed who will be responsible to actually delineate the buffer zone on site (considering actual on site conditions and to ensure that large trees are not destroyed for this purpose).
- Spoil material may not be pushed / stockpiled into the buffer zone or riparian zones.

## 8. References

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# **Appendixes**

# **APPENDIX 1: SPECIALIST DETAILS**

## **APPENDIX 2: MAPS**