SPECIALIST REPORT

Ecological Assessment:
The clearance of indigenous vegetation for the construction of tourism facilities on the farm Qualipan 655KT to the north of Louis Trichardt, Limpopo Province

Author

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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: 2019-02-04

EXECUTIVE SUMMARY

The applicant has cleared approximately 3000m² of indigenous vegetation for the construction of a tourist facility without environmental authoirization. As part of the NEMA Section 24G rectification process, Afrika Enviro & Biology was appointed to conduct a bio-ecological assessment to aid in the process.

For logistic reasons and in order to meet timeframes, the author could not physically go onto the site for this assessment. Instead, the author used remote sensing to assess the site. Drone (remotely operated flying instrument) video footage and historical and recent Google aerial images were used to remotely assess the site. The author visited the site area during September 2018 but not for the purposes of an assessment and therefore the author is familiar with the location and habitat type. The author also completed a previous assessment on a nearby property (for the same applicant) which included similar habitat. These results were used in aid of the present assessment. However, it must be categorially stated that this assessment is based on assumptions made with reference to the available study material.

The literature research clearly indicates that the larger regional area (including the study area) can be considered to be a sensitive natural environment. This is affirmed by the numerous conservation areas and the biosphere reserve that were proclaimed in order to conserve and protect the unique biophysical features of the region. The activity entails a safari lodge aimed at high income eco-tourism. The site and completed lodge could potentially impact on several aspects concerning the natural environment:

Visual and topography:

- The design and construction of buildings that are incompatible with the natural environment would impose a negative visual impact:

The completed lodge buildings have been designed to blend with the natural surrounds and do not pose a significant negative visual impact.

Physical:

- The rock outcrop has construction constraints which could lead to intensive cut and fill operation to create a level development platform.
- Uncompromising topography.
- Access.
- Provision of all services infrastructure will have to be well engineered

The location of the site near to the existing lodge implies that service infrastructure, roads and electricity are available nearby. As the crest area is relative flat, intensive cut and fill operations were not necessary to create the building platform. From viewing the video material and google images, it is evident that site preparation and construction was strictly limited to the footprint and no unnecessary damage and clearing of vegetation occurred. Only a small amount of spoil material is visible on the video footage.

Bio-ecological aspects:

Rocky outcrops are seen as sensitive bio-ecological features (as is the case here) and uneducated development of such outcrops can potentially have significant impacts on biodiversity and ecological functions. The magnitude of consequences are discussed under the following headings:

2.1) **Loss and fragmentation of habitat**

The site is located near to the existing lodge area which means that no additional fragmentation of habitat is necessary for provision of services and infrastructure if an

alternative site further afield was developed. The aerial images indicate that the site preparation and construction activities were strictly confined to the development site alone. No unnecessary vegetation clearing, and generation of spoil material is evident. This consequence is localized to site level. The remainder of the outcrop remains in a natural state and similar (but pristine) habitat is present on other outcrops in the immediate surrounds. This impact has a low magnitude and the consequence of this impact is permanent and has a long-term effect.

2.2) **Loss of vegetation**
The aerial images indicate that the affected area on the outcrop consisted of open woodland, sparsely populated with trees and shrubs. Smaller xerophytic vegetation types would also be present. It is assumed that the loss of woody vegetation was low. This consequence is localized to site level. This impact has a low magnitude and the consequence of this impact is permanent and has a long-term effect.

2.3) **Loss of important flora communities and individuals**
Site clearing will lead to the loss of important flora communities and individuals. This may include prominent stands of trees or large / protected individual trees or herbaceous / xerophytic plants that have not yet been identified. The magnitude of this impact is unknown and cannot be assessed without a pre-development site investigation. However, this consequence is localized to site level and similar vegetation and habitat is present on the outcrops nearby. This impact has an unknown magnitude and the consequence of this impact is permanent and has a long-term effect.

2.4) **Loss of fauna**
Site clearing will lead to the loss of fauna individuals. In general, rocky outcrops specifically provide macro and micro habitat for a wide range of fauna, including sensitive taxa. It should be considered that the presence of the existing lodge and its associated activities has already discouraged larger, sensitive taxa from using the outcrop habitat. As this project's activities are localized to the site footprint (3000m²) it can be assumed that a limited loss of habitat for animals has occurred and smaller less mobile fauna could have been killed. More mobile taxa would have fled to the surrounding area as result of the disturbance. However, similar species will be present in the adjoining area as well and will be able to repopulate disturbed areas from the adjoining area after the affected area has stabilized (given that a suitable niche is present). It is not anticipated that any group of fauna is negatively affected in the long term by the activities. This impact has a low magnitude and the consequence of this impact is permanent and has a long-term effect.

2.5) **Ecological functions and connectivity**
The fragmentation of habitat resulting from the activities may influence the ecological functions of the local area. The loss of habitat and changes to the natural environment is very localized and small. For this reason, it is unlikely that ecological functions or connectivity with the surrounding environment has occurred. This impact has an insignificant magnitude.

In view of the above assessment it can be concluded that the cumulative impacts are of low significance. This would suggest that the decommissioning and complete rehabilitation is not an option. Mitigation measures are not relevant as the activity has already been completed. General recommendations are made in the report.

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    APPENDIX 1: SPECIALIST DETAILS

1. Introduction

1.1 Background and objectives

The applicant has unlawfully cleared approximately 3000m² of indigenous vegetation for the construction of a tourist facility without environmental authoirization. As part of the NEMA Section 24G rectification process, Afrika Enviro & Biology was appointed to conduct a bio-ecological assessment to aid in the process. The terms are as follows:

- Biodiversity and habitat assessment;
- Impact assessment;
- Recommendations.

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. Assessment methods and assumptions, uncertainties and limitations

For logistical reasons and in order to meet timeframes, the author could not physically go onto the site for this assessment. Instead, the author used remote sensing to assess the site. Drone (remotely operated flying instrument) video footage and historical and recent Google aerial images were used to remotely assess the site. The author visited the site area in September 2018 but not for the purpose of an assessment and the author is therefore familiar with the location and habitat type. The author also completed a previous assessment on a nearby property (for the same applicant) which included similar habitat. These results were used in aid of the present assessment. However, it must be categorially stated that this assessment is based on assumptions made with reference to the available study material.

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 habitat and their potential to be utilized by fauna.

3. Background Information

3.1 Biophysical description of the study area

The study area is located to the north of the Soutpansberg, approximately 40km north of the town Louis Trichardt by road (N1). The landscape is comprised of the plains to the north of the Soutpansberg Mountains with prominent rock outcrops (hills) and ridges in areas. Ephemeral drainage lines are present and draining occurs in a northerly direction.

The climate is semi-arid and influenced by the mountain range that is orientated east to west. The mountain range acts as a barrier between the Indian Ocean south-

eastern maritime climate and the northern continental climate influences. Rainfall during the summer months (October and March) is 300 to 400 mm with very dry winters from May to August. Summers are very hot, and temperatures range from 0.9 – 39.9 °C and the area is generally frost free. Climate is affected by the wind patterns from mountains. Wind effects erosion, desertification and air warming.

3.2 **Ecology & biodiversity**

On a national level, the study area is situated within the savannah biome, and is classified by Acocks (1953) as Sourish Mixed Bushveld (A19) and Mixed Bushveld (A18). Classified on a local scale and according to a more detailed system (Mucina & Rutherford, 2006) these areas are classified as *Musina Mopane Bushveld* (SVmp 1) on the plains and *Limpopo Ridge Bushveld* (SVmp 2) on the scattered ridges and outcrops. Both of these units have a *Least Threatened* conservation status and are poorly protected. Distribution included with Appendix 2 and short descriptions of these vegetation units underneath:

3.3 **Conservation & Importance**

Musina Mopane Bushveld

The Musina Mopane Bushveld is characterized by undulating to very irregular plains with some hills at an altitude of around 600m. On areas with deep sandy soils, the *Kirkia acuminata* (White Syringa) is one of the dominant tree species along with *Colophospermum mopane* (Mopane), *Combretum apiculatum* (Red Bushwillow) and *Grewia spp*. (Raisin bushes). The herbaceous layer is poorly developed, especially where mopane occurs in dense stands. This vegetation type is classified as poorly protected and “Least threatened” with 2% statutorily conserved in the Mapungubwe National Park, as well as the Nzhelele, Nwanedi, Musina and Honnet Nature Reserves. About 3% is transformed, mainly by cultivation, and soil erosion is moderate to high. The conservation target is 19%.

The geology consists mainly of gneisses and meta-sediments of the Beit Bridge Complex, with variable soils from deep red/brown clays to deep, freely drained sandy soils, to shallower types including skeletal Glenrosa and Mispah soil forms.

Important vegetation include trees such as *Colophospermum mopane* (Mopane), *Adansonia digitata* (Baobab), *Acacia nigrescens* (Knob thorn), *Combretum apiculatum* (Red Bushwillow), *Acacia senegal* var. leiorhachis (Slender Three-hook Thorn) and *Commiphora mollis* (Velvet Corkwood). Conspicuous small trees and shrubs include *Grewia bicolor* (White Raisin), *Grewia flava* (Velvet Raisin), *Boscia foetida* subsp. *rehmanniana* (Stink Shepherd’s tree) and *Terminalia prunioides.* (Lowveld cluster-leaf).

Limpopo Ridge Bushveld

This vegetation type covers the irregular hills and ridges of much of the area in the vicinity of the Limpopo River. The altitude varies from 300 m to 700 m in the east, with some hills reaching 1 000 m in the west. The vegetation type of the surrounding plains is classified as Musina Mopane Bushveld. The vegetation structure is

moderately open savannah with a poorly developed ground layer. *Kirkia acuminata* (White Syringa) is prominent on many of the ridges along with *Adansonia digitata* (Baobab). On shallow calcareous gravel and calcium-silicate soils, the shrub *Catophractes alexandri* is dominant. Areas of sandstone of the Clarens Formation are prominent in places such as Mapungubwe National Park. Although not as prominent as at Mapungubwe National Park, sandstone ridges also occur in the study area.

Important vegetation includes the *Adansonia digitata* (Baobab), *Sclerocarya birrea* (Marula), *Colophospermum mopane* (Mopane), *Commiphora glandulosa* (Tall Common Corkwood), *Terminalia prunioides* (Lowveld cluster-leaf), *Boscia albitrunca* (Shepherd's tree) and various wild figs (*Ficus spp*).

This vegetation type is classified as moderately protected and "Least Threatened", with some 18% statutorily conserved in the Kruger and Mapungubwe National Parks. Only about 1% is transformed, mainly by cultivation and mining. The conservation target is 19%.

3.4 **Important environments and geography**

It is a well-known fact that the Soutpansberg and immediate surrounds is a centre of plant endemism. According to the map provided by Van Wyk & Smith (2001) the study area is situated within the boundaries of this centre, although it is not within the core area of the mountain range. Several studies in the Soutpansberg mountain area indicated its importance with regard to biodiversity, endemic plant species and also several red data species. The Vhembe Biosphere Reserve (VBR) was proclaimed with the objective to offer protection to the bio-ecological diversity of this region. The study area falls within the boundary of the VBR and within the buffer zone but not in the core zone of the VBR.

The Limpopo Conservation Plan (LCP) is a systematic conservation plan adopted by the Province (LEDET, 2013). According to this plan, the total study area is defined as *Critical Biodiversity Area-2* (CBA-2); (Appendix 2). The LCP handbook gives the following management objectives for CBA-2:

Best Design Selected Sites: Areas selected to meet biodiversity pattern and/or ecological process targets. Alternative sites may be available to meet targets.

Objectives: Maintain in a natural state with limited or no biodiversity loss.

Recommendations: Avoid conversion of agricultural land to more intensive land uses, which may have a negative impact on threatened species or ecological processes.

Compatible Land Use: Current agricultural practices including arable agriculture, intensive and extensive animal production, as well as game and ecotourism operations, so long as these are managed in a way to ensure populations of threatened species are maintained and the ecological processes which support them are not impacted.

Incompatible land use: Urban land uses including residential. More intensive agricultural production than is currently undertaken on site.

4. Vegetation & habitat report and general biophysical descriptions

4.1 **Site and habitat & vegetation description**

This site is located on a sandstone outcrop (location: S22°49’41.6” / E29°49’54.5”) at an elevation of 760m (approximately 40-50m above the surrounding plains). The general site features and surrounds are projected in Figure 1.1. An existing tourism lodge is located at the southern foot of the outcrop, this has been recently upgraded. A lodge with an ecological footprint area of approximately 3000m² and access road of 90m long was recently constructed (2017-2018) on the outcrop. The area affected by these construction activities is the subject of this assessment. A pre-development aerial view of the activity site is projected in Figure 1.2 and a post development view is projected in Figure 1.3. The drone video footage that was viewed included footage of the site preparation and early construction phase up to completion of the project. The following conclusions are made upon studying the available sources and using the report by Afrika Enviro & Biology (2018) as reference:

The vegetation on the slope of the outcrop is expected to have a mixed woodland structure and is expected to be dominated by *Acacia burkei* (shrubs and trees) and other species potentially present are *Acacia nigrescens, Lannea discolor, Sclerocarya birrea, Combretum apiculatum, Boscia albitrunca* and *Commiphora africana*.

The lack of soil substrate and very hot temperatures on the crest of the outcrop limits the floral diversity and most taxa present here are specialist xerophytes. Grass and forbs are very sparse and only *Aristida spp* and *Indigofera* can be expected. *Croton gratissimus* and *Euclea crispa* shrubs is expected to occur where soil is present on the outcrops. *Xerophyta retinervis* and *Ficus abutifolia* (rock growing specialists) individuals may occur where a niche is available. Shrubs and small trees potentially present on the crest are *Boscia foetida* subsp. *Rehmanniana, Commiphora marlothii* and the Lebombo ironwood, *Androstachys johnsonii*.

The rock outcrops will provide micro-habitat for several species of specialist fauna and it can be expected that especially invertebrates, reptiles and small mammals will find their niche underneath loose rocks and, in the cracks, and fissures present. Figure 1.1 indicates that shrubs and trees were present on the site footprint of approximately 3000m² and were destroyed by the activities. The identification of the destroyed vegetation is not known and cannot be confirmed. It is assumed that taxa similar to the abovementioned could have been destroyed. The construction site of the road evidently did not have result in a significant loss of vegetation as the route selection took cognizance of larger trees and shrubs.

4.2 **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.

The core of the Soutpansberg Centre of Endemism is associated with the rocky areas within the Soutpansberg Mountains, with approximately 3000 vascular plant species and one endemic genus (*Zoutpansbergia caerulea*). Approximately 1.5% of the species recorded within the Soutpansberg Centre of Endemism are considered endemic/near-endemic species/intraspecific taxa. The study area is not situated in the core area of this centre and the vegetation units do not include the units associated with high occurrence of endemism. However, the possibility of endemic species being present was investigated.

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 Act and the provincial nature conservation legislation. The National List for Red Data flora is the most updated and applicable reference for vegetation conservation. Applicable legislation that protect flora in South Africa and Limpopo Province are the National Environmental Management Biodiversity Act of 2004 (NEMBA), the National Forests Act of 1998 (NFA) and the Limpopo Environmental Management Act of 2003 (LEMA). A list of important flora (Endemic and Red Data Listed) which has potential to be present in the study area included with Table 2.1 and protected flora in Table 2.2. It is not known whether any of these taxa were present on the activity site before commencement of activities.

Table 2.1 National RDL and endemic flora potential for the relevant quarter degree grid.

Name	Status	Distribution & Habitat	Potential presence
Aloe angelica	Least Concern Endemic	Soutpansberg and Blouberg Bushveld, on drier regions of the mountain.	Unlikely Expected on foothills to south
Ceropegia cimiciodora	VU	Soutpansberg Mountain Bushveld region	Probable in larger study area
Combretum vendae	Least concern Endemic	Soutpansberg to Blouberg. Acidic sandy soils, savanna	Unlikely Expected on foothills to south
Elaeodendron transvaalense	NT	Widespread, savanna, bushveld	Probable in larger study area
Huernia nouhuysii	VU Endemic	Wyllie's Poort to Vivo Soutpansberg Mountain Bushveld	Probable in larger study area
Justicia montis-salinarum	Rare Endemic	Western Soutpansberg Mountains and northern foothills of eastern Blouberg. Dry, extremely rocky areas in sandy soils in rock crevices on lower, north-facing slopes, restricted to quartzite.	Probable in larger study area (Limited to quartzite)
Pavonia dentata	Least concern Endemic	Endemic	Probable in larger study area
Rhus magalismontana subsp. coddii	Least concern Endemic	Soutpansberg region	Probable Closed woodland on rocky outcrops
Sansevieria hallii	Least concern Near-Endemic	Confined to southeastern Zimbabwe and the northeastern corner of the Limpopo Limpopo Ridge Bushveld	Probable Closed woodland on rocky outcrops
Merwilla plumbea	NT	Widespread in eastern half of SA	Probable Exposed areas on rocky outcrops

Table 2.2 Protected flora recorded in the study area

Scientific Name	RDL Status	Regulating Act	Habitat
Sclerocarya birrea	Not listed	LEMA; NFA	Plains and outcrops
Philenoptera violacea	Not listed	MNCA; NFA	Plains, riparian areas.
Vachellia erioloba	Not listed	LEMA; NFA	Plains.
Balanites maughamii	Not listed	MNCA;	Plains.
Adansonia digitata	Not listed	LEMA; NFAA;	Plains.
Boscia albitrunca	Not listed	NFA	Plains and outcrops.
Combretum imberbe	Not listed	NFA	Plains, riparian areas.

5. Terrestrial Fauna Report

The fauna investigation was not a comprehensive specialist survey but rather an overview of the available habitats and their potential to be utilized by fauna listed in the checklists prepared by a desktop study. However, the affected area was investigated for fauna actually present.

5.1 **Amphibians**

Frogs will utilize the aquatic and terrestrial habitats on all the alternatives, for several reasons, including breeding purposes. No sensitive habitats essential for the survival of frogs will be directly affected. Twenty-six frog species' range of distribution includes the study area, one of these have Red Data status (Minter et al 2004). This is the Northern Forest Rain Frog (*Breviceps silvestris*). However, this species is localized to the Soutpansberg to the south of the study site and is not expected to be present on site. Although frogs can be expected on the outcrop, this rocky habitat will not be ideal for frogs as it may become very hot and the absence of water prolonged periods of time are limiting parameters.

The potential impacts of the proposed activity will be limited to the extent of the site footprint only (which will be 3000m²). Considering the small footprint size, it is not expected that frogs were significantly affected by the activities and individuals will be able to adapt to the changes and move away from disturbed areas.

5.2 **Reptiles**

According to the South African Reptile Conservation Assessment (SARCA); (Bates et al. 2014) approximately 120 species of reptiles can potentially occur in the larger study area. The terrestrial and arboreal habitats present in the larger study area will provide habitat for a diverse group of important reptiles that are considered endemic or are Red Data Listed. Several Endemic and Near Endemic species can be expected (Table 3.1).

Table 3.1 Important reptiles of the study area (Bates et al, 2014).

Scientific Name	Common Name	Endemic	Status	Potential presence
Crocodylus niloticus	Nile Crocodile	Widespread throughout Africa. In the Atlas region it is distributed from the Zinkwazi River south of the Tugela River in Kwazulu-Natal.	Vulnerable A2ac	Unlikely
Afroedura transvaalica	Zimbabwe Flat Gecko (Transvaal Flat Gecko)	Endemic to southern Africa, the southernmost of which is contiguous with northern Limpopo Province.	Least Concern	High
Lygodactylus nigropunctatus incognitus	Cryptic Dwarf Gecko	An Ultra –endemic restricted to the summit of the Soutpansberg.	Data Deficient	Unlikely
Lygodactylus ocellatus soutpan-bergensis	Soutpansberg dwarf gecko	Endemic to the summit region of the Soutpansberg , Limpopo, South Africa	Near Threatened	Unlikely
Chirindia langi occidentalis	Soutpansberg worm lizard	Endemic to the low-lying areas of the Soutpansberg in northern Limpopo.	Vulnerable B1ab(iii)	Probable
Vhembelacerta rupicola	Soutpansberg Rock Lizard	Endemic to Limpopo, South Africa. Occurs widely throughout the Soutpansberg Range	Near Threatened	Probable
Smaug warreni depressus	Flat Girdled Lizard	Endemic to Limpopo Province, South Africa, where it occurs along the Soutpansberg Range and on smaller ridges between this range and Woodbush in the south.	Least Concern	Unlikely
Platysaurus intermedius parvus	Blouberg Flat Lizard	Endemic to the Blouberg range in Limpopo Province South Africa.	Least Concern	Unlikely
Platysaurus minor	Waterberg Flat Lizard	Endemic to the western half of Limpopo, South Africa where it occurs throughout the Waterberg range, extending into the foothills of the Blouberg range to the north.	Least Concern	Unlikely
Platysaurus relictus	Soutpansberg Flat Lizard	Endemic to the Soutpansberg Range in Limpopo Province, South Africa. Within the Soutpansberg, it is most common on northern slopes where there is less rainfall and more exposed rock.	Least Concern	Probable
Acontias richardi	Richard's Legless Skink	Endemic to northern Limpopo Province, where it is highly restricted to the Soutpansberg district.	Near Threatened	Unlikely
Scelotes limpopoenis albiventris	White-Bellied Dwarf Burrowing Skink	A South African endemic with an extremely limited range, from just west of the Blouberg Nature Reserve to Lang Jan Nature Reserve and vicinity in the Soutpansberg district of Limpopo Province.	Near Threatened	Unlikely
Xenocalamus transvaalensis	Speckled Quill-Snouted Snake	Endemic to southern Africa. Found in two distinct populations: one reaching from Mapelane, north- eastern KwaZulu-Natal, into southern Mozambique; and the other located in northern Limpopo and possibly extreme eastern Botswana.	Least Concern	Probable
Amblyodipsias microphthalmia nigra	Soutpansberg Purple-Glossed Snake	Endemic to Limpopo Province. Its distribution is centred in the Soutpansberg area, from where it extends eastwards to the Pafuri region of the Kruger National Park.	Least Concern	Probable

It can be assumed that the rock outcrop would provide ideal habitat for several species of reptiles, including important taxa (Table 3.1). However, the potential impacts of the activity will be limited to the extent of the site footprint only (3000m²).

It is not anticipated that these taxa will be significantly affected by the proposed activities. Although a loss of habitat will occur in the natural areas, these taxa will be able to move away to undisturbed habitat nearby.

5.3 **Birds**

The literature review indicates that a diverse group of birds may utilize the area. More than 400 species' range of distribution falls within the study area. Due to the topography and habitat types present in the study area, the expected birds can be limited to savannah and mixed bushveld specific species. There are no IBA sites within- or nearby the study area.

The study area falls in the savanna biome and consists mainly of mixed bushveld and shrubland as described in section 4 of this report. This implies that a wide range of bushveld birds can be expected in the area. Nearby mountainous terrain and natural areas will ensure that the whole ecological spectrum of birds may be present permanently in the surrounding area or as visitors from further afield and will use the area for one purpose or another. No surface water or wetlands are present at site level.

It is not anticipated that RDL or commonly found birds will be significantly affected by the proposed activities. Although a loss of habitat has occurred, these taxa will be able to adapt to the changes and move away from disturbed areas and will most probably utilize the affected area again after the impacts have stabilized.

5.4 **Mammals**

A diverse group of small to medium sized mammals will utilize the natural habitats of the larger study area. However, the locality of the site and nearby human activities will definitely have a negative effect on the actual presence of mammals on site. The location of the affected area (on the crest of the outcrop) and the presence of the nearby existing lodge (humans activities / disturbance) will limit the potential for larger mammals and most species present will be smaller mammals and nocturnal species as human activities during daytime will limit their normal habits. Smaller mammals of conservation importance which' distribution range falls within the site locality are given in Table 3.2.

Table 3.3 Endemic and Red Data Listed mammals of the study area (Child et al, 2016)

Name	Distribution / Endemic / Range Description	Regional Status 2016	IUCN Status	Potential presence
Cloeotis percivali Short-eared Trident Bat	Percival's trident bat is largely confined to southern Africa.	Endangered	Least Concern	Visitor
Nycteris woodi Wood's Slit-faced Bat	Endemic Edge of range. It occurs in the extreme northern areas of Limpopo (Limpopo valley) in the Great Limpopo Trans frontier Park and Greater Mapungubwe Trans frontier Conservation Area.	Near Threatened	Least Concern	Visitor
Pipistrellus anchietae Anchieta's Pipistrelle	It could be more widespread in southern Africa than is currently understood (Skinner and Chimimba 2005).	Near Threatened	Least Concern	Visitor
Rhinolophus blasii Peak-saddle Horseshoe Bat	The Peak-saddle Horseshoe Bat has a large range in the Palearctic and the Afro tropics	Near Threatened	Least Concern 2016	Visitor

Rhinolophus swinnyi Swinny's Horseshoe Bat	This bat has been recorded from the eastern parts of South Africa, much of Zimbabwe, and northwestern Mozambique.	Vulnerable	Least Concern	Visitor
Miniopterus schreibersii Schreibers' Long-fingered Bat	Occurs throughout South Africa.	Near Threatened		Visitor
Atelerix frontalis Southern African Hedgehog	Southern African Hedgehogs range from southwestern Angola in the west, through northwestern and central Namibia, eastern Botswana, much of South Africa and western Zimbabwe.	Near Threatened	Least Concern	Visitor
Crocidura maquassiensis Maquassie Musk Shrew	This is a rare species, recorded only from disparate localities in Zimbabwe, Mantenga Falls in the middle-veld region of Swaziland (Monadjem 1998), Limpopo (Motlateng and Blouberg, and more recently in the Soutpansberg Mountains.	Vulnerable	Least Concern	Unlikely
Crocidura mariquensis Swamp Musk Shrew	This widely but patchily distributed species. It occurs in wetlands and waterlogged grasslands.	Near Threatened	Least Concern	Unlikely
Aethomys ineptus Tete Veld Rat	Endemic Near (possibly endemic) This species is probably restricted to the savannahs of South Africa and Swaziland	Least Concern	Least Concern	Probable resident
Dendromus nyikae Nyika African Climbing Mouse	Endemic Edge of range. This species occurs widely but patchily throughout southern Africa.	Least Concern	Data Deficient	Probable resident
Smutsia temminckii Ground Pangolin	This species is the most widespread of the African pangolin species.	Vulnerable	Vulnerable	Visitor

The mobility of most mammals will ensure that they can adapt or relocate if disturbed by the proposed activity. The potential impacts of the proposed activity will be limited to the extent of the site footprint only (which is 3000m²). As the activity site is small and the construction methods employed were careful of not disturbing the surrounding environment, it is unlikely that mammals has been, or will be significantly affected during any phase of the activity.

5.5 **Invertebrate Report**

Potentially, the natural habitats on site will offer refuge to all invertebrate groups with the available habitats on site. This consists of a large number of species for which field searches are to extensive to be accommodated for the present study (Picker *et. al.* 2002). Invertebrates fill a very important role in the food chain and overall ecology of any ecosystem. The large-scale loss of any group of invertebrates can have detrimental effects on the functioning of an ecosystem. As this project's activities are localized to the site footprint (3000m²) a limited loss of invertebrates could have occurred, but it is not anticipated that any group of invertebrates will be significantly affected in the long term. The reason being, that similar species of invertebrates will be present in the adjoining area as well. Furthermore, invertebrates will be able to repopulate disturbed areas after these have stabilized (and provide a suitable niche).

The habitats present have the potential to support approximately 275 species of butterflies. Cross-referenced larval host plants and prey items, a total of approximately 175 species may be present at one time or another. Due to the dynamic mobility of butterflies, any of these species has the potential to be present at a given time, although variable conditions will be a limiting factor. No Red Data Listed species are expected in the study area. These include butterflies, several species is highly endemic and their distribution very localized to the Soutpansberg area and northern part of the Limpopo Province. Three species have a slight

possibility to be present within the study area (Table 3.4). However, the habitat is not ideal to support these, and it is unlikely that any of these are present. It is not anticipated that butterflies have been significantly affected by the proposed activity as long as adequate mitigation measures are followed.

Table 3.4 Important butterflies that were assessed (Mecenero et al,2013).

Scientific Name	**Habitat and Ecology**	**Distribution / Endemic / Range Description**	**Regional Status 2016**	**IUCN Status**
Coenyra rufiplaga Sekhukhune Shadefly	Wooded savanna at the base hill and mountians, in flatlands or on forest edges. Found at higher altitudes then its congeners. Central Bushveld; Mesic Highveld Grassland.	South Africa (limpopo) **Endemic** to the Atlas region; from the Waterberg near Thabazimbi in the west to the Wolkberg and as far as Ohrigstad in the east.		LC
Anthene crawshayi juanitae Juanita's Hairtail	Riverine woodland Granite Lowveld	South Africa (limpopo) **Endemic** to the Atlas region; north of Ohrigstad,		CR
Anthene minima minima Little Hairtail	South Africa restricted to arid savanna and dry areas. Lowveld; Central Bushveld	South Africa (KwaZulu-Natal, Limpopo, Mpumalanga) and Swaziland:		LC

5.7 **Synopsis of fauna assemblage**

Natural occurring fauna will be present in the local study area and would have been present on the affected area. The fauna potential will be represented by animals that can use the available habitat which is limited to the niche provided by the outcrop and associated vegetation cover. Nearby human activities would also have discouraged sensitive taxa (taxa that are easily disturbed) from being present before commencement of activities.

6. Discussion and Impact Assessment

The single most important impact on biodiversity as consequence of transforming virgin land is the loss of vegetation and loss and fragmentation of natural habitats and consequently the loss of fauna. The report indicates the vegetation structure and fauna assemblage on the sites is already impoverished as result of the historic modifications to the natural environment.

The potential and present impacts related to the above discussion were assessed by applying the following methodology:

- The *nature* of the impact entails a description of the cause of the impact, what will be affected and how it will be affected;
- The *extent* refers to the area where the impact will be significant e.g. on site, local area, regional, provincial, national or international;
- The *duration* refers to the lifetime of the impact:
    - Short term: 0-5 years
    - Medium term: 5-15 years
    - Long term: >15 years
    - Permanent

- The *probability* describes the likelihood of the impact occurring during the duration:
    - Improbable (Low likelihood)
    - Probable (Distinct possibility)
    - Highly Probable (Most likely)
    - Definite (Impact to occur regardless of any preventative measures)
- The *significance* is determined by analyzing the above subjects and is assessed as low, medium or high.

The literature research clearly indicates that the larger regional area (including the study area) can be a sensitive natural environment. This is affirmed by the numerous conservation areas and the biosphere reserve that were proclaimed to conserve and protect the unique biophysical features of the region. The site investigations indicate that all three the alternative sites are in an almost virgin environment within the larger context of the region. It is therefore essential that these alternatives are objectively assessed to make conclusions and to make recommendations with regards to the activity. The activity entails a safari lodge aimed at high income eco-tourism. The site and completed lodge could potentially impact on several aspects concerning the natural environment:

Visual and topography:

- The design and construction of buildings that are incompatible with the natural environment would impose a negative visual impact:

The completed lodge buildings have been designed to blend with the natural surrounds and do not pose a significant negative visual impact.

Physical:

- The rock outcrop has construction constraints which could lead to intensive cut and fill operation to create a level development platform.
- Uncompromising topography.
- Access.
- Provision of all services infrastructure will have to be well engineered

The location of the site near to the existing lodge implies that service infrastructure, roads and electricity are available nearby. As the crest area is relative flat, intensive cut and fill operations was not necessary to create the building platform. Viewing the video material and google images, it is evident that site preparation and construction was strictly limited to the footprint and no unnecessary damage and clearing of vegetation has occurred. Only a small amount of spoil material is visible on the video footage.

Bio-ecological aspects:

Rocky outcrops are sensitive bio-ecological features (as is the case here) and uneducated development of such outcrops can potentially have significant impacts on biodiversity and ecological functions. The magnitude of consequences is discussed under the following headings:

2.1) **Loss and fragmentation of habitat**
The site is located near to the existing lodge area which means that no additional fragmentation of habitat is necessary for provision of services and infrastructure if an alternative site further afield was developed. The aerial images indicate that the site preparation and construction activities were strictly confined to the development site alone. No unnecessary vegetation clearing, and generation of spoil material is evident. This consequence is localized to site level. The remainder of the outcrop remains in a natural state and similar (but pristine) habitat is present on other outcrops in the immediate surrounds. This impact has a low magnitude and the consequence of this impact is permanent and has a long-term effect.

2.2) **Loss of vegetation**
The aerial images indicate that the affected area on the outcrop consisted of open woodland, sparsely populated with trees and shrubs (Figure 1.2). Smaller xerophytic vegetation types would also be present. It is assumed that the loss of woody vegetation was low. This consequence is localized to site level. This impact has a low magnitude and the consequence of this impact is permanent and has a long-term effect.

2.3) **Loss of important flora communities and individuals**
Site clearing will lead to the loss of important flora communities and individuals. This may include prominent stands of trees or large / protected individual trees or herbaceous / xerophytic plants that have not yet been identified. The magnitude of this impact is unknown and cannot be assessed without a pre-development site investigation. However, this consequence is localized to site level and similar vegetation and habitat is present on the outcrops nearby. This impact has an unknown magnitude and the consequence of this impact is permanent and has a long-term effect.

2.4) **Loss of fauna**
Site clearing will lead to the loss of fauna individuals. In general, rocky outcrops specifically provide macro and micro habitat for a wide range of fauna, including sensitive taxa. It should be considered that the presence of the existing lodge and its associated activities has already discouraged larger, sensitive taxa from using the outcrop habitat. As this project's activities are localized to the site footprint (3000m²) it can be assumed that a limited loss of habitat for animals has occurred and smaller less mobile fauna could have been killed. More mobile taxa would have fled to the surrounding area as result of the disturbance. However, similar species will be present in the adjoining area as well and will be able to repopulate disturbed areas from the adjoining area after the affected area has stabilized (given that a suitable niche is present). It is not anticipated that any group of fauna is negatively affected in the long term by the activities. This impact has a low magnitude and the consequence of this impact is permanent and has a long-term effect.

2.5) **Ecological functions and connectivity**
The fragmentation of habitat resulting from the activities may influence the ecological functions of the local area. The loss of habitat and changes to the natural

environment is very localized and small. For this reason, it is unlikely that ecological functions or connectivity with the surrounding environment has occurred. This impact is of insignificant magnitude.

In view of the above assessment, it can be concluded that the cumulative impacts are of low significance. This would suggest that the decommissioning and complete rehabilitation is not an option.

7. Conclusion and Recommendations

It can be concluded that site selection mitigated potential impacts associated with the natural bio-ecological environment. As the activity has already been completed there are no use for mitigation measures at this stage. General recommendations that should be followed are:

- Use only indigenous flora for landscaping.
- Implement an alien invader vegetation control program.
- Prevent and mange soil erosion.
- Do not use electrocution apparatus to eliminate insect at night as many innocent invertebrates, reptiles and small mammals are also at risk.

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contributions from a network of thousands of scientific experts around the world. These include members of the IUCN Species Survival Commission Specialist Groups, IUCN Red List Partners, and many others, including experts from universities, museums, research institutes and non-governmental organizations. Website: www.iucn.org/redlist

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Appendixes

APPENDIX 1: SPECIALIST DETAILS

CURRICULUM VITAE
Louis Daniel van der Walt

1. Background Information

1.1 Personal Details

Name: Louis Daniël van der Walt (Danie).
I.D. No. 6805305147080
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Email: danie.aeb@gmail.com

Marital status: Married
Date of Birth: 1968-05-30
Nationality: Republic of South Africa.

1.2 Secondary Education

Senior certificate examination at Linden Hoërskool, Johannesburg, 1985.

1.3 Tertiary Education

Completed the following degrees at the Rand Afrikaans University:

- **B.Sc. (Biol. Sciences)**, 1989: Majoring in Zoology and Botany.
- **B.Sc. Honoribus (Zoology)**, 1990: Subjects including Ichthyology & Aquaculture, Ecology, Physiology, Genetics, Entomology & Parasitology, Nematology, Evolution and Philosophy.
- **M.Sc. (Zoology) cum laude**, 1993. Title of script: An evaluation of the allozyme variation as well as the effect of cryopreservation of semen on the genetic selection of the African catfish (*Clarias gariepinus*).

Certified copies of these degrees and the abstract of the M.Sc. script are included with Appendix A.

1.4 Accredited Courses

I have successfully completed the following courses:

- Implementing integrated management systems (SHEQ): ISO9001, ISO14001 and OHSAS18001. Centre for Environmental Management, North-west University, Potchefstroom, October 30 – November 4, 2005.
- Wetland Training: Delineation, Functions and Rehabilitation of Wetlands. University of Pretoria, Rietvlei Nature Reserve, May, 2006.
- Environmental Impact Assessment (NEMA Regulations). Centre for Environmental Management, Northwest University, Potchefstroom, May, 2007.
- OHS Act and Regulations (Act 85 of 1993). Department of Labour, Gauteng, September, 2010.

1.5 Short Courses and Practical Workshops

- Fish Index Validation: Field Testing. DWAF Guidelines. Waterval-Boven. August 2006
- Short Course: Soil Classification and Wetland Delineation. Terrasoil Science. Nelspruit. February 2009.
- SASS5 Biomonitoring Course. Nepid Consultants. Sabie. March 2013.

1.6 **Publications and contributions**

During my tertiary education as well as my professional career, I have published several scientific reports and attended and contributed to various workshops and congresses. These are listed in Appendix B.

2. Previous Employment and Experience

Rand Afrikaans University, JHB

January 1990 - December 1993: Laboratory and field assistant.
1992: Aquarium and Technical assistant to Department of Zoology.
Duties included:

- Managing the zoology aquarium;
- Designing and construction of fish breeding and holding systems;
- Technical and field assistant to various research projects;
- Mentor to students in methods to collect and identify wild fish specimens and aquatic invertebrate specimens;

Silver Creek Aquaculture, Hazyview

January 1994 - May 1997: Biologist and manager of aquaculture, specializing in African Sharptooth Catfish, Tilapia and the large scale production of ornamental fish.
Duties included:

- Designing and construction of fish breeding and holding systems;
- Developing and maintenance of production systems and methods;
- Genetic selection of brood stock;
- Artificial and controlled propagation of fish;
- Managing of abattoir and fish processing;
- Marketing of fish products.

Aquaculture Consultant and Biologist

May 1997 – Present. In parallel with my present full time occupation, I also manage my own aquaculture business, specializing in ornamental fish, e.g. Goldfish, Japanese Koi and tropical fish.
Duties include:

- Designing and construction of fish breeding and holding systems;
- Developing and maintenance of production systems and methods;
- Genetic selection of brood stock;
- Artificial and controlled propagation of fish;
- Diagnoses and treatment of fish diseases;

3. Present Employment

3.1 **Environmental Assessments**

Since 2004, I am employed as an Environmental Assessment Practitioner and Environmental Scientist. Under this appointment my work description entails the execution of the environmental impact assessment process as prescribed by the present EIA regulations. My duties include scoping and public participation, authority consultations, interpretation of scientific studies, impact assessments, report writing, etc. The main goal that I attempt with

the EIA process is to investigate all the available alternatives and information in order to provide a basis for a manageable product or project that is environmentally sustainable and acceptable to all the stakeholders involved. Projects were completed under both ECA and NEMA regulations (Appendix C).

During five years of executing EIA's, I have covered many subjects, including ESKOM power lines and substations, communication towers, dam construction, township and industrial developments, abattoirs, subdivisions, filling stations, pipelines, borrow pits and roads, golf estates, country estates, etc. A list of EIA projects in which I was the leading agent is given in Appendix C. It should be noted that, in the capacity of Biologist I also completed the biodiversity assessment reports, if so required, for these EIA projects.

3.2 **Biodiversity Consultations**

As part of my graduate and post graduate studies I was trained to do biodiversity assessments and monitoring and I assisted in several such research projects at the R.A.U. I was also fortunate enough to assist Dr. Andrew Deacon (South African National Parks Board, KNP, Skukuza) on many occasions in biodiversity assessments and monitoring projects. This training and the experience that I have gained as biologist I presently utilize to do biodiversity studies in several fields of study (as listed below), mainly for environmental processes (e.g. EIA, EMPR, EMP processes). These assessments and studies are compiled for specific terms of reference, e.g. basic assessments, scoping assessments, monitoring or comprehensive specialist surveys. For these biodiversity assessments I am subcontracted as *Afrika Enviro & Biology* in order to combine the specialist biological consultations under a single entity. I rely on my training as biologist to ensure that the assessments are conducted according to standard scientific methods and procedures in order to be scientifically correct and can therefore be used as reference by co-scientists.

3.3 **Present scope of work**

By combining my professional abilities as Environmental Scientist and Biologist, I am experienced in compiling the following environmental reports:

- Biodiversity Assessments (Inclusive of the above scope of work);
- Environmental Impact Assessments;
- Environmental Management Plans;
- Rehabilitation Plans;
- Environmental Compliance Monitoring and Reporting.

Completed biodiversity and aquaculture reports are available on request.

4. Experience and attributes

4.1 **Environmental Scientist and Biodiversity Consultant**

I have completed EIA projects as well as biodiversity assessments in a diverse range of environments and natural habitats, including very sensitive areas that required intensive research and detailed assessments. A short elaboration is as follows:

Due to Mpumalanga's diverse natural resources and topographic features, this province has several very special areas of natural and biological importance. Areas such as these where I have been fortunate enough to do assessments include:

- The Eastern Escarpment, including centrums of floral endemism such as Steenkamps Berg (Machadodorp – Dullstroom); the Wolkberg centre: Barberton, Pilgrims Rest and Lydenburg and its surrounds as well as Sekhukhune Land;
- The general Lowveld region stretching from Hazyview - Nelspruit - Komatipoort;
- The general Highveld area stretching from Delmas in the west to Dullstroom and Belfast in the east;

My area of work also covers other provinces, including Gauteng-, Limpopo- and North West Province. I have a comprehensive data basis for all of the areas mentioned above and I also have an impressive library, including all the most recent literature, as well as rare and out of print literature, to aid in research. Where necessary, the assessments include consultations and the co-operation of the relevant conservation authorities and scientists.

It should be noted that my reports is accepted by Mpumalanga Parks and Tourism Agency, Limpopo Parks and Tourism, Mpumalanga Department of Agriculture and Land Affairs, National Department of Water Affairs and Environment (DWA) and the National Department of Environmental Affairs and Tourism.

The integrity of my reports has never been questioned by any stakeholder and the quality and content of work has always been complimented.

5. Referees

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