

SENSITIVITY SCREENING OF THE PROPOSED BAKUBUNG RESERVOIR, PILANESBERG NATIONAL PARK, NORTH-WEST PROVINCE



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1. Introduction

Pilanesberg Resorts (Pty) Ltd is planning to construct a one megaliter potable water reservoir at the edge of Bakubung Lodge, Pilanesberg National Park, North-west Province. The new reservoir will replace three existing aging reservoirs currently servicing the Bakubung Lodge. NuLeaf Planning & Environmental are conducting the Basic Assessment for this development and have appointed ECOREX Consulting Ecologists CC to undertake a biodiversity sensitivity screening for the reservoir site.

The study was undertaken by Warren McClelland, terrestrial ecologist and owner of ECOREX Consulting Ecologists. He has conducted over 120 biodiversity assessments for EIAs in South Africa since 2006, primarily in savannah and grassland biomes, as well as numerous assessments in 14 other countries in southern and tropical Africa. Warren has expertise in both flora and vertebrate fauna. He co-authored the “Field Guide to Trees and Woody Shrubs of Mpumalanga and Kruger National Park” (Jacana 2002), and is lead author on the “Field Guide to the Wildflowers of Kruger National Park” project.

2. Approach and Methods

Fieldwork was conducted on 21 April 2017 and the location of the proposed reservoir was indicated on site by a Pilanesberg Resorts (Pty) Ltd representative. The site was surveyed on foot along a meandering transect covering all microhabitats present. All species of flora that were located on site were recorded and the area was screened for potentially occurring conservation-important vertebrate fauna (mammals, birds, reptiles and frogs). The search was focused on locating conservation-important species as listed under the North West Biodiversity Management Act (No. 4 of 2016), National Forests Act (No. 30 of 1998), National Environmental Management: Biodiversity Act Threatened or Protected Species (No. 10 of 2004) and various national Red Data Lists. The location of all conservation-important species was recorded on a hand-held GPS (with approximately three-meter accuracy).

3. Assumptions and Limitations

The field survey period was very brief, given the small impact footprint that needed to be searched. This did not allow for a comprehensive survey of fauna, most of which would not be resident but would move irregularly through the site. However, sufficient time was available to survey the flora present. A number of herbaceous plant species were not in flower at the time of fieldwork and it is possible that certain geophytic species were not visible due to tall and quite dense grass cover. However, recommendations are given to mitigate this shortcoming and it should not negatively influence a Record of Decision.

4. Study Area

The proposed development is located on portion 6 of the farm Ledig 909 JQ, which is situated within Pilanesberg National Park, Moses Kotane Local Municipality, North West Province (Figure 1). The proposed development will entail the construction of a new one megalitre (1000 m³) potable water reservoir to replace the three existing aging reservoirs currently servicing the Bakubung Lodge. It is understood that the total development footprint will not exceed one hectare.

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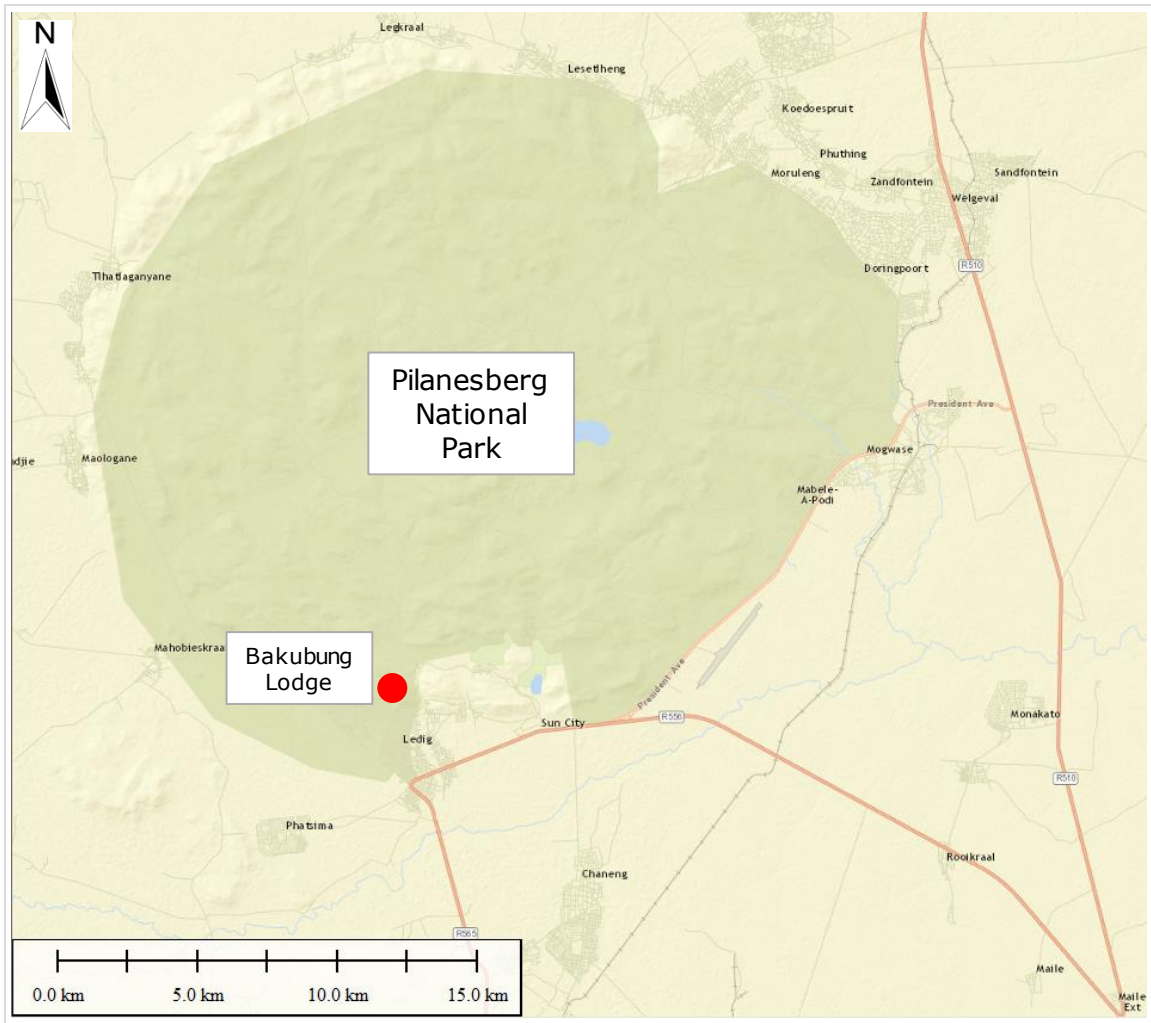


Figure 1. Location of the study site within the Pilanesberg National Park

5. Results

5.1 NATIONAL VEGETATION TYPE

The study area is situated within **Pilanesberg Mountain Bushveld** in the Central Bushveld Bioregion of the Savanna Biome (Mucina & Rutherford, 2006). The vegetation type is closely associated with the rocky hills encircling the ancient volcanic caldera that dominates Pilanesberg, occurring on a variety of mostly alkaline soils. Vegetation structure is fairly dense, broad-leaved, deciduous woodland on hillslopes, with more open woodland or savannah on hilltops and valley floors. Soils are mostly shallow, rocky lithosols on the hillslopes. Broad-leaved tree species such as *Combretum apiculatum*, *C. molle*, *C. zeyheri* and *Strychnos cocculoides* are dominant canopy species in Pilanesberg Mountain Bushveld, with shrubs or small trees such as *Diplorhynchus condylocarpon*, *Elephantorrhiza burkei* and *Grewia flava* being prominent in the mid-stratum. Dominant grasses include *Chrysopogon serrulatus*, *Elionurus muticus*, *Panicum maximum* and *Themeda triandra* (Mucina & Rutherford, 2006). Pilanesberg Mountain Bushveld occurs almost entirely within the Pilanesberg National Park and is thus well protected. The vegetation type has a national conservation status of **Least Threatened** (Mucina & Rutherford, 2006).

The map in Mucina & Rutherford (2006) indicates Zeerust Thornveld as being close to the boundary of Bakubung Lodge, but data collected during fieldwork indicate that this vegetation type is not represented in the study area.

5.2 THREATENED ECOSYSTEMS

The study area is not situated within any Threatened Ecosystems as defined in Government Gazette No. 34809 of 9 December 2011 (DEAT, 2011).

5.3 NORTH-WEST BIODIVERSITY CONSERVATION PLAN

The study area is in an Ecological Support Area level 1 (Protected Area Corridor) according to the latest version of the North-West Biodiversity Sector Plan (Schaller *et al.*, 2015). There are six Protected Area Corridors in North-West province, with the study area being located in the Pilanesberg-Madikwe Heritage Park. Ecological Support Areas (ESAs) are not necessarily essential for meeting biodiversity representation targets, but they play an important role in supporting the ecological functioning of critical biodiversity areas and/or in

delivering valuable ecosystem services.

5.4 VEGETATION DESCRIPTION - STUDY SITE

The proposed reservoir site is situated within the hills near the southern boundary of Pilanesberg National Park. The vegetation within the proposed reservoir footprint has been significantly impacted by bush clearing, possibly for the nearby transmission line route. Vegetation structure is low, closed to mid-dense shrubland (Figure 2). Dominant large woody shrubs or small trees are *Acacia caffra*, *A. nilotica*, *Combretum apiculatum*, *C. molle* and *C. zeyheri*, while other fairly common woody species include *Dichrostachys cinerea*, *Grewia flava* and *G. monticola*. Dominant grass species are *Aristida congesta*, *Panicum maximum* and *Heteropogon contortus*, while other common species are *Enneapogon cenchroides*, *Melinis repens*, *Eragrostis* cf. *chloromelas* and *Hyperthelia dissoluta*. Herbaceous species were poorly represented in the dense, grassy undergrowth, but these species are likely to be more visible after spring / early summer rains when grass cover is lowest. Herbaceous species located during fieldwork included *Justicia betonica*, *Corbichonia decumbens*, *Melhania prostrata*, *Rhynchosia totta*, *Sphedamnocarpus pruriens* and *Waltheria indica*. Sixty-six species were recorded in the 1200m² footprint during fieldwork (Appendix 1), with the most well represented families being Leguminosae (9 species), Poaceae (9 species), Malvaceae (7 species) and Asteraceae (5 species). The highest species richness was among forbs (28 species), although cover-abundance of these species was generally low. The dominant growth form in terms of species richness and cover-abundance is trees and shrubs (26 species).

Three protected plant species were recorded within the footprint (Appendix 1). Three coppicing trees or low shrubs of *Sclerocarya birrea* subsp. *caffra*, which is protected under the National Forests Act (No. 30 of 1998), were located and are indicated on the map in Figure 3. Two other species are listed as specially protected under Schedule 2 of the North West Biodiversity Management Act (No. 4 of 2016), namely *Pellaea calomelanos* and *Spirostachys africana*. These species are also indicated on the map in Figure 3.



Figure 2. Photos of low, dense shrubland vegetation within the reservoir footprint

5.5 POTENTIALLY OCCURRING SPECIES OF CONSERVATION CONCERN

5.5.1 Flora

Fifteen threatened plant species occur in North West Province (Hahn, 2013), none of which occur in the vicinity of Pilanesberg National Park and none are thus likely to occur in the impact footprint. One species protected under the Threatened or Protected Species list of the National Environmental Management: Biodiversity Act (No. 10 of 2004), *Drimia sanguinea*, occurs in woodland habitat in the vicinity of Pilanesberg, as well as eight species that are protected under the National Forest Act (No. 84 of 1998) (Appendix 3). Most of these have a low likelihood of occurring within the reservoir footprint, either because of unsuitable habitat or because they are easily located species that were not found during fieldwork. One species, *Sclerocarya birrea*, was confirmed to occur during fieldwork and is dealt with in section 5.4 above. Plant species protected under Schedule 2 of the North West Biodiversity Management Act (No. 4 of 2016) that potentially occur include all fern species (except *Pteridium aquilinum*), *Drimia sanguinea* and *Spirostachys africana* (Appendix 3). Two of these protected species were confirmed to occur in the reservoir footprint during fieldwork, namely the fern *Pellaea calomelanos* and *Spirostachys africana*.

5.5.2 Fauna

Mammals

Schaller *et al.* (2015) list 24 mammal species of conservation concern for North West Province, comprising two Critically Endangered (CR) species, four Endangered (EN) species, four Vulnerable (VU) species and 14 Near Threatened (NT) species. However, according to the latest Red list assessment (EWT, 2016), the province has no CR species, four EN species, ten VU species and 12 NT species. Seventeen of these 26 species occur in Pilanesberg National Park in habitats similar to those in which the study site is located (Appendix 2). Twenty-one species protected under the Threatened or Protected Species list of the National Environmental Management: Biodiversity Act (No. 10 of 2004) are also potentially present (Appendix 4), many of which are also included in the above list of threatened species. However, none of these are likely to be resident in the impact footprint or adjacent land because of the close proximity of Bakubung Lodge.

Birds

Scaller *et al.* (2015) also list 40 bird species of conservation concern for the province, but the 2015 national Red List assessment (Taylor *et al.* 2015) was not taken into account and

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the current list stands at 44 species, comprising nine EN species, 14 VU species and 21 NT species. Five EN species, four VU species and seven NT species occur in Pilanesberg National Park in similar habitats to those at the study site (Appendix 2), of which seven species are also protected under the Threatened or Protected Species list of the National Environmental Management: Biodiversity Act (No. 10 of 2004) (Appendix 4). Only one of the species of conservation concern, European Roller (NT), is likely to occasionally occur within the impact footprint, although the habitat is far from optimal for this species. Ten of the remaining 15 species are birds of prey that may forage over the study site but are unlikely to utilise habitats within the footprint, while the rest are unlikely to be present.

Seven Important Bird Areas (IBAs) have been designated in North West Province, one of which is Pilanesberg National Park (Barnes, 1998). The Park holds a rich bird species diversity and is important foraging ground for a number of highly threatened species such as Cape Vulture, White-backed Vulture, Bateleur and Martial Eagle.

Herpetofauna

Only two herpetofauna species occur in Pilanesberg National Park, namely Nile Crocodile (VU) and Giant Bullfrog (NT). No habitat for either species is present within the vicinity of the study site and they are unlikely to ever occur in the development footprint. Two reptile species are protected under the Threatened or Protected Species list of the National Environmental Management: Biodiversity Act (No. 10 of 2004), namely Nile Crocodile and Southern African Python. While no habitat is present for Nile Crocodile, there is a moderate likelihood that Southern African Python could infrequently move through the study site, although it is unlikely to be resident.



Figure 3. Location of species of conservation-concern within the impact footprint

6. POTENTIAL IMPACTS

While a detailed impact assessment was not part of the terms of reference for this report, key potential impacts associated with the proposed development can be described. The following are potential impacts on natural habitat:

- **Loss of plant species of conservation importance** – three protected species are located within the impact footprint (*Sclerocarya birrea* subsp. *caffra*, *Spirostachys africana*, *Pellaea calomelanos*) and will be destroyed during the construction phase if no mitigation measures are in place;
- **Invasion of natural habitat by alien plants** – a seed-base of invasive alien species is already present within the impact footprint, and invasion by these species could increase as bare soil is exposed; if well managed, this is likely to only have moderate significance.

7. CONCLUSION & RECOMMENDATIONS

The vegetation within the impact footprint is degraded and has been fairly recently cleared, possibly for maintenance of a nearby transmission line. As a result, few mature trees are present in the impact footprint and even these are damaged and coppicing. No threatened or near threatened species of flora or fauna were confirmed during fieldwork and the site is considered to have low sensitivity. However, one species that is protected under the National Forest Act (*Sclerocarya birrea*) and two species that are protected under the North West Biodiversity Management Act (*Spirostachys africana*, *Pellaea calomelanos*) were located. The study site is located within a large conservation area in which numerous threatened species of fauna are present. However, given the close proximity to a busy lodge and the degraded state of the vegetation, few of these species are ever likely to utilise the habitats present.

The following recommendations can be made regarding the proposed development:

- If possible, the position of the water reservoir should be such that all *Sclerocarya birrea* and *Spirostachys africana* trees and shrubs are avoided; these trees and shrubs should be demarcated with emergency tape and the construction team should be given strict instructions to avoid these plants.
- The small fern *Pellaea calomelanos* can be carefully excavated and transplanted into suitable representative habitat adjacent to the study site.
- Where possible, no new roads should be constructed but the existing gate at the Bakubung fence should be reopened and upgraded to allow access to the proposed reservoir site.
- Poaching could be a significant threat. If any external labour teams are used during construction, then these teams should preferably be accommodated off site; if this is not possible then teams should be carefully monitored to ensure that no unsupervised access to plant and animal resources takes place.

There are no perceived fatal flaws in this project from a terrestrial ecology perspective. If the above mitigation measures are implemented then there should be no significant negative impacts on the ecology of the site.

8. REFERENCES

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9. APPENDICES

Appendix 1. Plant species checklist – reservoir footprint

Taxon	Growth Form	Conservation Status	Protected Status	Cover-Abundance
Pteridophyta (Ferns)				
Family Sinopteridaceae				
<i>Pellaea calomelanos</i>	Fern		NWBMA	+
Magnoliophyta - Dicots				
Family Acanthaceae				
<i>Barleria macrostegia</i>	Forb			+
<i>Crossandra fruticulosa</i>	Forb			+
<i>Justicia betonica</i>	Forb			1
Family Amaranthaceae				
<i>Achyranthes aspera</i> *	Forb			1
<i>Alternanthera pungens</i> *	Forb			1
<i>Gomphrena celosioides</i> *	Forb			1
Family Anacardiaceae				
<i>Ozoroa paniculosa</i>	Tree			+
<i>Sclerocarya birrea subsp. cafra</i>	Tree		NFA	1
<i>Searsia lancea</i>	Tree			1
<i>Searsia leptodictya</i>	Tree			1
Family Asteraceae				
<i>Felicia cf. muricata</i>	Forb			1
<i>Hilliardiella oligocephala</i>	Forb			+
<i>Pegolettia cf. lanceolata</i>	Forb			1
<i>Schkuhria pinnata</i> *	Forb			1
<i>Tarchonanthus parvicapitulatus</i>	Tree			1
Family Celastraceae				
<i>Gymnosporia buxifolia</i>	Tree			1
Family Combretaceae				
<i>Combretum apiculatum</i>	Tree			2
<i>Combretum molle</i>	Tree			1
<i>Combretum zeyheri</i>	Tree			2
Family Convolvulaceae				
<i>Ipomoea obscura</i>	Forb			1
Family Crassulaceae				
<i>Kalanchoe paniculata</i>	Succulent			+
Family Ebenaceae				
<i>Euclea crispa</i>	Shrub			1
Family Euphorbiaceae				
<i>Acalypha sp.</i>	Forb			+
<i>Croton gratissimus</i>	Tree			1
<i>Dalechampia sp.</i>	Forb			+
<i>Spirostachys africana</i>	Tree		NWBMA	1

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Lamiaceae <i>Ocimum americanum</i> *	Forb			1
Family Leguminosae: subfamily Caesalpinoideae <i>Chamaecrista mimosoides</i>	Forb			1
Family Leguminosae: subfamily Mimosoideae <i>Acacia caffra</i> <i>Acacia nilotica</i> <i>Acacia robusta</i> subsp. <i>robusta</i> <i>Dichrostachys cinerea</i> var. <i>africana</i>	Tree Tree Tree Shrub			2 2 + 2
Family Leguminosae: subfamily Faboideae <i>Rhynchosia totta</i> <i>Stylosanthes fruticosa</i> <i>Tephrosia purpurea</i> <i>Tephrosia villosa</i>	Forb Forb Forb Shrub			1 + 1 1
Family Malpighiaceae <i>Sphedamnocarpus pruriens</i>	Forb			1
Family Malvaceae: subfamily Byttnerioideae <i>Hermannia</i> cf. <i>depressa</i> <i>Waltheria indica</i>	Forb Forb			1 1
Family Malvaceae: subfamily Dombeyoideae <i>Dombeya rotundifolia</i> <i>Melhania prostrata</i>	Tree Forb			1 1
Family Malvaceae: subfamily Grewioideae <i>Grewia flava</i> <i>Grewia monticola</i>	Shrub Shrub			2 2
Family Malvaceae: subfamily Malvoideae <i>Hibiscus trionum</i>	Forb			+
Family Molluginaceae <i>Corbichonia decumbens</i>	Forb			1
Family Rhamnaceae <i>Berchemia zeyheri</i> <i>Ziziphus mucronata</i>	Tree Tree			1 1
Family Sapindaceae <i>Pappea capensis</i>	Tree			+
Family Scrophulariaceae <i>Aptosimum</i> sp.	Forb			1
Family Solanaceae <i>Solanum panduriforme</i>	Shrub			1
Family Urticaceae <i>Pouzolzia mixta</i>	Shrub			+
Family Verbenaceae <i>Lippia javanica</i> <i>Priva</i> cf. <i>cordifolia</i>	Shrub Forb			1 1
Magnoliophyta - Monocots				
Family Asparagaceae <i>Asparagus</i> cf. <i>setaceus</i>	Forb			+

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Family Commelinaceae				
<i>Commelina africana</i>	Forb			+
Family Hyacinthaceae				
<i>Ledebouria sp.</i>	Geophyte			+
Family Poaceae				
<i>Aristida congesta var. barbicollis</i>	Grass			2
<i>Aristida congesta var. congesta</i>	Grass			1
<i>Brachiaria nigropedata</i>	Grass			+
<i>Enneapogon cenchroides</i>	Grass			2
<i>Eragrostis cf. chloromelas</i>	Grass			1
<i>Heteropogon contortus</i>	Grass			3
<i>Hyperthelia dissoluta</i>	Grass			2
<i>Melinis repens</i>	Grass			1
<i>Panicum maximum</i>	Grass			2
TOTAL	66	0	3	

NFA = National Forest Act

NWBMA = North West Biodiversity Management Act

Appendix 2. Potentially Occurring Fauna Species of Conservation Concern

Common Name	Scientific Name	Likelihood of Occurrence	Reason
MAMMALS			
Endangered Species			
Black Rhinoceros	<i>Diceros bicornis minor</i>	Very Low	Degraded habitat; proximity to busy lodge
Roan Antelope	<i>Hippotragus equinus</i>	Very Low	Degraded habitat; proximity to busy lodge
African Wild Dog	<i>Lycaon pictus</i>	Low	Proximity to busy lodge
Southern Mountain Reedbuck	<i>Redunca fulvorufula fulvorufula</i>	Very Low	Unsuitable habitat
Vulnerable Species			
Cheetah	<i>Acinonyx jubatus</i>	Very Low	Degraded habitat; proximity to busy lodge
Tsessebe	<i>Damaliscus lunatus</i>	Low	Degraded habitat; proximity to busy lodge
Black-footed Cat	<i>Felis nigripes</i>	Low	Proximity to busy lodge
Sable Antelope	<i>Hippotragus niger</i>	Very Low	Degraded habitat; proximity to busy lodge
Leopard	<i>Panthera pardus</i>	Low	Proximity to busy lodge
Temminck's Ground Pangolin	<i>Smutsia temminckii</i>	Low	Degraded habitat; proximity to busy lodge
Near Threatened Species			
South African Hedgehog	<i>Atelerix frontalis</i>	Moderate	Degraded habitat
Southern White Rhinoceros	<i>Ceratotherium simum</i>	Very Low	Degraded habitat; proximity to busy lodge
Serval	<i>Leptailurus serval</i>	Moderate	Degraded habitat
Brown Hyaena	<i>Parahyaena brunnea</i>	Moderate	Degraded habitat
African Striped Weasel	<i>Poecilogale albinucha</i>	Moderate	Degraded habitat
Peak-saddle Horseshoe Bat	<i>Rhinolophus blasii</i>	Low	Degraded habitat
Egyptian Tomb Bat	<i>Taphozous perforatus</i>	Low	Degraded habitat
BIRDS			
Endangered Species			
Bateleur	<i>Terathopius ecaudatus</i>	Low	Degraded habitat; proximity to busy lodge
Martial Eagle	<i>Polemaetus bellicosus</i>	Low	Degraded habitat; proximity to busy lodge
Cape Vulture	<i>Gyps coprotheres</i>	Low	Degraded habitat; proximity to busy lodge
Lappet-faced Vulture	<i>Torgos tracheliotos</i>	Low	Degraded habitat; proximity to busy lodge
White-backed Vulture	<i>Gyps africanus</i>	Low	Degraded habitat; proximity to busy lodge
Vulnerable Species			
Tawny Eagle	<i>Aquila rapax</i>	Low	Degraded habitat; proximity to busy lodge
Lanner Falcon	<i>Falco biarmicus</i>	Low	Degraded habitat; proximity to busy lodge
African Grass Owl	<i>Tyto capensis</i>	Very Low	Unsuitable habitat
Secretarybird	<i>Sagittarius serpentarius</i>	Very Low	Degraded habitat; proximity to busy lodge

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Near Threatened Species			
Kori Bustard	<i>Ardeotis kori</i>	Very Low	Unsuitable habitat
Red-footed Falcon	<i>Falco vespertinus</i>	Low	Degraded habitat; proximity to busy lodge
Pallid Harrier	<i>Circus macrourus</i>	Very Low	Unsuitable habitat
Melodious Lark	<i>Mirafra cheniana</i>	Low	Unsuitable habitat
European Roller	<i>Coracias garrulus</i>	Moderate	Degraded habitat
Abdim's Stork	<i>Ciconia abdimii</i>	Low	Unsuitable habitat
Marabou Stork	<i>Leptoptilos crumeniferus</i>	Low	Unsuitable habitat

Appendix 3. Potentially Occurring Protected Plant Species

Scientific Name	Likelihood of Occurrence	Reason
ToPS List		
<i>Drimia sanguinea</i>	Low	Degraded habitat
NWBMA Schedule 2		
<i>Drimia sanguinea</i>	Low	Degraded habitat
All ferns (except <i>Pteridium aquilinum</i>)	Confirmed	
<i>Spirostachys africana</i>	Confirmed	
NFA List		
<i>Acacia erioloba</i>	Low	Unsuitable habitat
<i>Boscia albitrunca</i>	Low	Suitable habitat but not located during fieldwork
<i>Combretum imberbe</i>	Low	Unsuitable habitat
<i>Elaeodendron transvaalensis</i>	Low	Suitable habitat but not located during fieldwork
<i>Erythrophysa transvaalensis</i>	Low	Unsuitable habitat
<i>Pittosporum viridiflorum</i>	Low	Unsuitable habitat
<i>Sclerocarya birrea</i>	Confirmed	
<i>Securidaca longipedunculata</i>	Low	Suitable habitat but not located during fieldwork

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Appendix 4. Potentially Occurring ToPS Fauna Species

Common Name	Scientific Name	Likelihood of Occurrence	Reason
MAMMALS			
Black Rhinoceros	<i>Diceros bicornis minor</i>	Very Low	Degraded habitat; proximity to busy lodge
Roan Antelope	<i>Hippotragus equinus</i>	Very Low	Degraded habitat; proximity to busy lodge
African Wild Dog	<i>Lycaon pictus</i>	Low	Proximity to busy lodge
Cheetah	<i>Acinonyx jubatus</i>	Very Low	Degraded habitat; proximity to busy lodge
Tsessebe	<i>Damaliscus lunatus</i>	Low	Degraded habitat; proximity to busy lodge
Black-footed Cat	<i>Felis nigripes</i>	Low	Proximity to busy lodge
Sable Antelope	<i>Hippotragus niger</i>	Very Low	Degraded habitat; proximity to busy lodge
Leopard	<i>Panthera pardus</i>	Low	Proximity to busy lodge
Temminck's Ground Pangolin	<i>Smutsia temminckii</i>	Low	Degraded habitat; proximity to busy lodge
Lion	<i>Panthera leo</i>	Low	Proximity to busy lodge
Southern White Rhinoceros	<i>Ceratotherium simum</i>	Very Low	Degraded habitat; proximity to busy lodge
Serval	<i>Leptailurus serval</i>	Moderate	Degraded habitat
Brown Hyaena	<i>Parahyaena brunnea</i>	Moderate	Degraded habitat
African Elephant	<i>Loxodonta africana</i>	Moderate	Degraded habitat
Aardvark	<i>Orycteropus afer</i>	Moderate	Degraded habitat
Bat-eared Fox	<i>Otocyon megalotis</i>	Low	Unsuitable habitat
Cape Fox	<i>Vulpes chama</i>	Moderate	Degraded habitat
Red Hartebeest	<i>Alcelaphus buselaphus</i>	Moderate	Degraded habitat
Blue Wildebeest	<i>Connochaetes taurinus</i>	Moderate	Degraded habitat
Blesbok	<i>Damaliscus pygargus phillipsi</i>	Moderate	Degraded habitat
Burchell's Zebra	<i>Equus quagga burchelli</i>	Moderate	Degraded habitat
BIRDS			
Tawny Eagle	<i>Aquila rapax</i>	Low	Degraded habitat; proximity to busy lodge
Lappet-faced Vulture	<i>Torgos tracheliotos</i>	Low	Degraded habitat; proximity to busy lodge
White-backed Vulture	<i>Gyps africanus</i>	Low	Degraded habitat; proximity to busy lodge
Cape Vulture	<i>Gyps coprotheres</i>	Low	Degraded habitat; proximity to busy lodge
Martial Eagle	<i>Polemaetus bellicosus</i>	Low	Degraded habitat; proximity to busy lodge
Bateleur	<i>Terathopius ecaudatus</i>	Low	Degraded habitat; proximity to busy lodge
Kori Bustard	<i>Ardeotis kori</i>	Very Low	Unsuitable habitat
REPTILES			

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Nile Crocodile	<i>Crocodylus niloticus</i>	Very Low	Unsuitable habitat
Southern African Python	<i>Python natalensis</i>	Moderate	Degraded habitat

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Appendix 5. Specialist CV

Name : **Warren Lee McClelland**
Profession : Terrestrial Ecologist
Date of Birth : 7 Sep 1972
Name of Firm : ECOREX Consulting Ecologists cc
Position in Firm : Sole Member
Years with firm : 11
Nationality : South African



Qualifications :

- N.Dip. [Nature Conservation] Cape Peninsula University of Technology 1993

Membership in Professional Societies:

- South African Association of Botanists
- International Association for Impact Assessment (SA)

Languages :

	<u>Speaking</u>	<u>Reading</u>	<u>Writing</u>
English (home):	Excellent	Excellent	Excellent
Afrikaans:	Good	Good	Good
isiZulu:	Good	Fair	Fair
siSwati:	Fair	Poor	Poor

Countries of Work Experience : Angola, Botswana, Democratic Republic of the Congo, Lesotho, Malawi, Mali, Mozambique, Namibia, Republic of Guinea, Sierra Leone, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe.

OVERVIEW OF EXPERIENCE

- 15 years experience in conducting baseline surveys, data analysis and report writing in various biomes in southern and tropical Africa, particularly savannah, forest and grassland biomes.
- 5 years experience game reserve management (KwaZulu-Natal, Mpumalanga)
- **Co-author of acclaimed Field Guide to Trees and Woody Shrubs of Mpumalanga & Kruger National Park, Jacana Publishers, 2002.**
- Specialist knowledge of identification of plants, mammals, birds, reptiles and frogs.
- Experience in reporting according to IFC Performance Standards for numerous international projects in Sierra Leone, Angola, Democratic Republic of the Congo, Republic of Guinea, Tanzania, Malawi, Mali, Mozambique and Zambia.
- Accredited with the discovery of a number of new plant species, most notably *Gladiolus diluvialis* Goldblatt & Manning (Fish River Canyon, Namibia), *Streptocarpus sekhukhuniensis* ms (Stoffberg, Mpumalanga – manuscript currently being edited) and *Barleria lebomboensis* Darbyshire, McClelland & Froneman (Lebombo Mts, Swaziland).
- **2014 Recipient of the Marloth Medal** from the Botanical Society of South Africa for co-authoring the Kruger tree field guide.
- Included as a major contributor in the forthcoming "Trees of Mozambique" (Burrows, Schmidt & Lotter).

Employment Record:

2005 - present	ECOREX Consulting Ecologists CC	Ecologist; Sole Member
2001 - 2005	Lawson's Birding Tours	Specialist Guide
2000 - 2001	Escarpment Ecological Consultants cc	Founder Director
1996 – 2000	Crystal Springs Game Reserve	Reserve Manager
1995	Mutemwa Lodge, western Zambia	Lodge manager, guide
1993 - 1994	Natal Parks Board	Cadet field ranger

Sensitivity Screening: Bakubung Reservoir

SELECTED RECENT PROJECTS & EXPERIENCE

West Africa			
Mali	2014	Biodiversity Baseline Study and Impact Assessment for Kalana Gold Mine, Yanfolila	Epoch Resources – Fanie Coetzee (fanie@epochresources.co.za)
	2013	Biodiversity Baseline Study and Impact Assessment for Fekola Gold Mine, Fedougou	Epoch Resources – Fanie Coetzee (fanie@epochresources.co.za)
Republic of Guinea	2012	Review of Specialist Studies conducted for an EIA for an aluminium mine near Bel-Air, in Bofa Prefecture.	Epoch Resources – Fanie Coetzee (fanie@epochresources.co.za)
Sierra Leone	2011	Biodiversity Baseline Study and Impact Assessment for Marampa Iron Ore Mine, Lunsar	SRK (U.K.) - Nicola Rump (nrump@srk.co.uk)
East Africa			
Tanzania	2011	Biodiversity Baseline Study and Impact Assessment for Mkuju River Uranium Project, Selous Game Reserve, Songea	Epoch Resources – Fanie Coetzee (fanie@epochresources.co.za)
Southern and South-central Africa			
Angola	2013	Biodiversity Management Plan for the raising of the Cambambe Dam wall, Kwanza River, Dondo	ERM – Jessica Hughes (jessica.hughes@erm.com)
Democratic Republic of the Congo	2014	Biodiversity Baseline Study and Impact Assessment for Pumpi Copper Mine, Kolwezi	Epoch Resources – Fanie Coetzee (fanie@epochresources.co.za)
	2013	Biodiversity Assessment of selected wetland habitats, Kamo Copper Mine, Kolwezi	Wetland Consulting Services – Gary Marneweck (GaryM@wetcs.co.za)
	2009-2011	Biodiversity Baseline Study and Impact Assessment for Kinsevere Copper Mine, Lubumbashi	Knight Piesold - Amelia Briel (abriel@knightpiesold.com)
	2008	Biodiversity Baseline Study for Ulindi Hydropower Scheme, Itombwe Mts, Kivu South	Knight Piesold - Amelia Briel (abriel@knightpiesold.com)
Malawi	2015	Terrestrial Ecology Survey of sugar mill site, Ethco, Dwangwa	ERM - Rachel Conti (Rachel.Conti@erm.com)
	2010	Terrestrial Ecology Survey of Kanyika Uranium Mine, Kasungu	Synergistics - Bronwyn Williams (bronwyn@synergistics.co.za)
Mozambique	2016	Biodiversity Baseline Study and Impact Assessment for an onshore gas pipeline, Inhassoro, Inhambane province	ERM – Jessica Hughes (jessica.hughes@erm.com)
	2015	Critical Habitat Assessment for coastal dry forest in Palma District, Cabo Delgado province	Enviro-Insight - Luke Verburgt (luke@enviro-insight.co.za)
	2015	Biodiversity Baseline Study for a Regional ESIA of Seismic Exploration blocks, SASOL, Inhassoro	Golder - Warren Aken (waken@golder.co.za)
	2014	Biodiversity Baseline Study and Impact Assessment for a coastal road between Pemba and Palma, Cabo Delgado province	ERM – Jessica Hughes (jessica.hughes@erm.com)
	2013	Biodiversity Monitoring Plan for Benga Coal Mine, Moatize	Rio Tinto - Isaac Ndlovu (isaac.ndlovu@riotinto.com)
	2012	Biodiversity Baseline Study and Action Plan for the Muanza Quarry, Gorongosa NP, Sofala province	Nepid Consultants – Dr Rob Palmer (rob@nepid.co.za)
	2011	Terrestrial Ecology component of the Biodiversity Study for the Four Dams Project (Corumana Dam, Gorongosa Dam, Metuchira Weir, Ressano Weir), Maputo and Sofala provinces	Austral-CowI - Jacob Ulrich (jacob.ulrich@australcowi.co.mz)
Namibia	2009	Biodiversity Baseline Study and Impact Assessment for Neckartal Dam, Keetmanshoop	Knight Piesold - Amelia Briel (abriel@knightpiesold.com)
South Africa	2013	Faunal Baseline Study and Impact Assessment for Riemvasmaak Hydro-electric Scheme, Augrabies Falls NP	Aurecon - Nelis Bezuidenhout (Nelis.Bezuidenhout@aurecongroup.com)
	2010	Biodiversity Baseline Study and Impact Assessment for Hoogland Chrome Mine, Steenkampsberg Mts, Mpumalanga	Metago Environmental Engineers - Hylton Allison (hallison@slrconsulting.com)
	2010	Assessment of the status of <i>Pelargonium sidoides</i> and harvesting potential in Lesotho and South Africa	South African National Biodiversity Institute - Domitilla Raimondo (Raimondo@sanbi.org)
Swaziland	2014	Biodiversity Baseline Study and Impact Assessment for Ethemba Dam, Hlatikulu	Knight Piesold - Neal Neervoort (nneervoort@knightpiesold.com)
		Biodiversity Value Assessment for the Mhlumeni Community Conservation land, Siteki	Rod de Vletter (devletter@gmail.com)
Zambia	2015	Botanical survey for ESIA for Ngonye Falls Hydropower Project, Zambezi River, Senanga	Ecotone - Michiel Jonker (michiel@ecotone-sa.co.za)
	2013	Biodiversity Baseline Study and Impact Assessment for Mulungushi Hydropower Project, Kabwe	ERM – Zoe Daniels (Zoe.Daniel@erm.com)
	2008	Biodiversity Baseline Study and Impact Assessment for Lumwana Copper Mine, Solwezi	Knight Piesold - Amelia Briel (abriel@knightpiesold.com)
Zimbabwe	2011	Biodiversity Baseline Study and Impact Assessment for Bokai Platinum Mine, Gweru	Epoch Resources - Fanie Coetzee (fanie.coetzee@epochresources.co.za)

Sensitivity Screening: Bakubung Reservoir

PUBLICATIONS

Books

Schmidt, E., Lötter, M.C. & McClelland, W.L. 2002. *Field Guide to Trees and Woody Shrubs of Mpumalanga & Kruger National Park*. Jacana Publishers, Houghton.

Peer-reviewed Journals

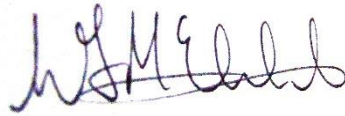
Darbyshire, I., McClelland, W.L. & Froneman, W. *in press*. *Barleria lebomboensis* (Acanthaceae), an endangered new species from the Lebombo Mountains of Swaziland. *Phytotaxa*.

McClelland, W.L. & Massingue, A. *in press*. New population and conservation assessment of *Ecbolium hastatum* (Acanthaceae). *Bothalia*.

DECLARATION

I declare that the particulars above are accurate and true to the best of my knowledge and belief.

SIGNATURE:



DATE: 2 May 2017

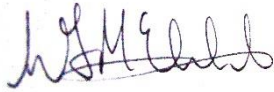
Appendix 6. Specialist Declaration

4.2 The specialist appointed in terms of the Regulations_

I, Warren McClelland, declare that --

General declaration:

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 form 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.



Signature of the specialist:

ECOREX Consulting Ecologists CC

Name of company (if applicable):

2 May 2017

Date: