



SPECIALIST BIODIVERSITY REPORT

**General Biodiversity and Ecology Report:
Remainder of the farm Dwarsloop 248KU
Bushbuckridge Local Municipality, Mpumalanga**

April 2021

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Specialist Environmental & Biodiversity Assessments

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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: 2021-04-09

Executive Summary

The applicant intends to demarcate stands on the property in extent of 54.24Ha. As partial requirement for the NEMA EIA process the environmental consultant appointed *Afrika Enviro & Biology* to conduct a site sensitivity verification and bio-ecological assessment to assist in recommending suitable locations for these activities in support of the application process.

The total extent of the property is 54.24Ha in size and is located adjacent to a residential area to the north of Dwarsloop town. The site is vacant and located to the west of the R40 provincial road and immediately to the north of the Ndlebesuthu River. The general area has been modified by the removal of the tree component and areas where the large trees component of the vegetation has been removed and sand mining has occurred and is in progress (on a commercial scale), resulting in the loss of woodland habitat and degradation of the natural environment. The sand mining has devastated large sections of land and consequently large excavations and barren surfaces are present. There are no rock outcrops or rocky habitats present on site. A seasonal drainage line is evident flowing from north to south attributing to the river

This investigation identified no sensitive ecological features or biota on site that will be affected by the proposed activity. The vegetation on site as well as the geomorphology has been subject to significant negative human induced modifications. The devastation caused to the environment as consequence of the sand mining and the modifications to the vegetation structure on site has reduced the habitat quality to such an extent that it can be considered as a suitable alternative site for this activity as opposed to sites located in natural habitat.

- Conserve the remaining large trees on site.
- The riparian zone and floodplain of the river (that encroaches on to the proposed site) must be protected by a 40m aquatic buffer zone.
- A 20m aquatic buffer is calculated for the drainage line on site.
- It is advised that the activities in the drainage line is rehabilitated / formalized.
- The local municipality should monitor the area in order to address the seemingly uncontrolled, illegal sand mining activities in watercourses and elsewhere. The mitigation measures included with report must be enforced.

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APPENDIX 1: SPECIALIST DETAILS

1. Introduction

1.1 Background and objectives

The applicant intends to demarcate stands on the property in extent of 54.24Ha. As partial requirement for the NEMA EIA process the environmental consultant appointed *Afrika Enviro & Biology* to conduct a site sensitivity verification and bio-ecological assessment to assist in recommending suitable locations for these activities in support of the application process. The terms of reference for this investigation are as follows: Biodiversity Assessment with the following objectives:

- Vegetation and fauna assessment;
- Ecological mapping and sensitivity zoning of relevant areas;
- Habitat differentiation and delineation;
- Impact assessment, recommendations and mitigation measures;

For the purposes of this report, the site was investigated on 2021-04-09.

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

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.

The fauna investigation was not a comprehensive specialist survey as required by the Mpumalanga Tourism and Parks Agency (MTPA) *Minimum requirements for environmental study reports when applying for authorization for an activity that may have a detrimental effect on the environment*.

The reasoning is that sensitive faunal habitats have been identified during the first phase of the assessment and are excluded from the development plan and will be protected by buffer zones from the development activities (Figure 1). The proposed activities will thus not have a detrimental effect on the environment / sensitive areas with a high fauna / flora / ecological potential. Specialist studies to cover each subject or taxon will require considerable time and the employment of additional specialists to complete. This will be a very expensive task and the results will be subjective as it is more than likely that only a small percentage of the fauna that actually have the potential of being present (or are actually present) will be recorded.

Furthermore, in recent time, reference and specialist literature, data basis', and distribution lists have become available that are accurate and reliable. By employing these sources, a desktop investigation (supported by physical habitat investigations) of the potential fauna can be cross-referenced with the available habitat in order to predict the fauna potential of a specific area or habitat type. These results will be reliable to be used for planning purposes. The author has confidence that the results of the desktop study combined with the onsite assessments provide sufficient

information to make conclusions and provide recommendations regarding the fauna assemblage of the site.

However, in case that habitats may be destroyed that have potential to harbour high concentrations of biodiversity or threatened species and sensitive ecosystems the studies required by MTPA requirements will be of value to provide detailed results to be considered for the application process.

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.

2.3 Vegetation & habitats

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 named according to a unit's diagnostic floral feature 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 (POSA) as obtained from the SANBI data base. The aim was to identify distinct vegetation types and to establish their integrity and representation in the study area. The vegetation and habitats are described on site and local level in section 4 of this report.

2.4 Terrestrial Fauna

The fauna investigation is based on a desktop study verified by cross reference with available habitats of the study area in order to establish the faunal potential. All fauna that were observed during field trips and floral surveys were also recorded. However, selected survey sites were searched for fauna and habitats were identified during the vegetation surveys so as to establish the faunal potential of a particular area. The fauna potential is discussed in section 5 of this report.

2.5 Watercourse delineation

A basic (phase 1) watercourse classification and delineation is included with the scope of this investigation. The delineation is 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. The classification of the type of watercourse/s present on site is discussed in section 4.1.

2.6 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. 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 1.1).

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 and riparian sensitivity is measured only on its maintenance of biodiversity and basic ecological functions at this basic level of assessment.

Table 1 Criteria used for sensitivity rating of habitats

Ecological Importance/Biodiversity Value	Sensitivity Rating
Terrestrial and Riparian 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>
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>
Habitats and ecosystems 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>
Habitats and ecosystems which have been modified from the reference state with the result that habitats have been fragmented and the trend is in a negative direction. Ecological importance as well as biodiversity value is low. External impacts will not have a significant impact on its status.	<i>Low</i>
No ecological significance. Highly transformed, dominated by infrastructure development. Ecological functions may be considered irreversibly impaired.	<i>Very Low</i>

3. Background Information

3.1 Biophysical description of the study area

The general study area consists of plains bushveld typical of the eastern Mpumalanga Lowveld. The most serious transformation of the natural environment is the gradual loss of vegetation due to the dependence of the human population on the environment and the establishment of formal and informal settlements. A typical Lowveld climate prevails with seasonal summer-rainfall, warm temperatures and dry winters. MAP ranging between 450mm and 900mm.

3.2 Ecology & biodiversity

Nationally, the vegetation type is classified as the Lowveld (A10) according to Acocks (1987) or Mixed Lowveld Bushveld (LR 19) according to Low & Rebelo (1996). On a regional scale the veld unit is classified as *Granite Lowveld* (SVI 3) according to Mucina & Rutherford (2006). *Granite Lowveld* is reasonably well protected (17% in the Kruger National Park and another 17% in adjacent conservation areas). More than 20% has been transformed as result of cultivation and settlement. This ecosystem is rated as *Vulnerable* (Mucina & Rutherford, 2006).

3.3 Conservation planning

Mpumalanga Biodiversity Sector Plan (MTPA, 2014)

The Mpumalanga Biodiversity Sector Plan (MBSP) is a systematic conservation plan developed and adopted by the Province (DARDLEA) in order to aid in environmental and conservation planning of the province. The categories relevant to this project are projected in Appendix 2 and listed in Table 1.2.

Table 1.2 MBCP and NFEPA categories relevant to the site

Freshwater ecosystems / NFEPA inventory		
Category	Subcategory	Content
Other Natural Areas	Other Natural Areas	
Heavily or moderately modified	Heavily modified	Heavily modified
Terrestrial Ecology		
Category	Subcategory	Content
Other Natural Areas	Other Natural Areas	
Heavily or moderately modified	Heavily modified	Heavily modified
Heavily or moderately modified	Moderately modified	Old lands
Land Cover 2010		
Cultivated		1.5Ha area

4. Vegetation & habitat report and general biophysical descriptions

4.1 General site and activity description

The total extent of the property is 54.24Ha in size and is located adjacent to a residential area to the north of Dwarsloop town. The site is vacant and located to the west of the R40 provincial road and immediately to the north of the Ndlebesuthu River. The general area has been modified by the removal of the tree component and areas where the large trees component of the vegetation has been removed and sand mining has occurred and is in progress (on a commercial scale), resulting in the loss of woodland habitat and degradation of the natural environment. The sand mining has devastated large sections of land and consequently large excavations and barren surfaces are present. There are no rock outcrops or rocky habitats present on site. A seasonal drainage line is evident flowing from north to south attributing to the river (Figure 1).

The biophysical features and habitat classification of the study site is georeferenced on an aerial image (Figure. 1). Illustrations of the environment and vegetation / habitat are included in the following section.

4.2 Habitats & vegetation

The present state of the natural habitat on the site is described and illustrations of in the following section:

i) Secondary shrubland

The site area can be described as degraded shrubland as result of the removal of the tree component of the vegetation structure in the historic past as well as the total removal of vegetation where sand is mined. This was done for energy and construction purposes by the local population. As result of this the reference state of woodland habitat has been degraded to shrubland with small pioneer and secondary growth trees and individual large trees that have survived from the natural state. Shrubs and woody vegetation in general is dominated by *Parinari curatellifolia* and *Terminalia sericea* while *Dichrostachys cinerea* is also common in places and is an indication of poor veld management in the past. Secondary growth (from stumps), *Faurea saligna* shrubs are present on the higher lying section. Other common shrubs and small trees are *Searsia leptodictya*, *Rhoicissus tridentata*, *Bauhinia galpinii*, *Dombeya rotundifolius*, *Ochna natalitia*, *Diospyros whyteana*, *Gymnosporia glaucophylla*, *Euclea natalensis* and *Euclea crispa*, *Annona senegalensis*, *Peltophorum africanum* and *Gymnosporia senegalensis*. Large trees that have remained of the natural structure are *Parinari curatellifolia*, *Schotia brachypetala*, *Strychnos madagascariensis*, *Diospyros mespiliformis* and *Sclerocarya caffra*.

The incidence of alien invasive vegetation is low but small thickets of *Lantana camara* are present in shady areas. No Red Data Listed (RDL) species of flora were identified and the potential of RDL species being present on site is low. Overall, vegetation diversity is medium and it can be concluded that the faunal potential is low as result of the degraded state and land uses in the larger local area which would discourage / eliminate the presence of wild animals. The overall ecological sensitivity rating is **Low-Medium**.



The vegetation structure is dominated by secondary growth from cut down stumps of trees



Sand mining has devastated large areas and only solitary large trees remain of the natural assemblage

ii) Watercourses and hydrological features

The main watercourse in this sub catchment is the Ndlebesuthu River which is situated directly south of the site, flow in this river is intermittent / seasonal. The river has a sandy bed and banks and sand bars are present within the channel. *Phragmites australis* reed beds are present on the marginal and in-stream zones. A grass (*Sporobolus africanus* dominated) covered floodplain is present on the northern bank and forms part of the riparian zone. Most of the obligate riparian vegetation and large trees has been lost and only solitary trees or small clumps of trees remain, species present are *Schotia brachypetala*, *Albizia versicolor*, *Ficus sur*, *Diospyros mespiliformis* and *Sclerocarya caffra*

A first order drainage line is situated on site and tribute to the river. This drainage line is seasonal and flows from north to south along the central section of the site. The natural characteristics of this drainage line have been completely destroyed in places by the vegetation clearing and sand mining activities on site and the channel is only discernible in the northern section. Riparian vegetation consists largely of terrestrial shrubs, small trees and solitary large trees (as listed under the previous heading). Flow originate as seep zones to the north where sand mining has reached the perched water table (any wetland characteristics has been lost if it was present previously). The watercourses are severely affected by negative impacts and of **Low-Medium** ecological importance.



The riparian zone of the Ndlebesuthu River is under severe pressure from sand mining and loss of riparian vegetation



The first order drainage line on site has been severely modified as result of sand mining



It is important that the remaining riparian trees and floodplain of the river is conserved

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 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). Red Data Listed (RDL) species that has the potential to be present in the local area and associated with the habitats on site are listed in Table 2.1.

Table 2.1 National RDL species potential for the relevant quarter degree grid (2531AA)

Species	National Status	Habitat preference
<i>Brachystelma chlorozonum</i>	Near Threatened	Bushveld; Lowveld
<i>Dioscorea sylvatica</i>	Vulnerable	Rock outcrops
<i>Elaeodendron transvaalense</i>	Near Threatened	Bushveld; Lowveld
<i>Eriosema naviculare</i>	Endangered	Lowveld to the east of Hazyview
<i>Siphonochilus aethiopicus</i>	Critically Endangered	Forests

No RDL species was recorded. The legally protected species that were recorded are listed in Table 2.2. 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.

Table 2.2 Protected and RDL species recorded on the property

Scientific Name	RDL Status	Protected Status	Vegetation community/ Habitat
<i>Faurea saligna</i>		MNCA	Woodland
<i>Sclerocarya birrea</i>		MNCA; NFA	Woodland

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 Nature Conservation Act (1998). The control by landowners of such species is regulated by these Acts. Several important exotic species are present and most of the natural habitats contain alien invader species (Section 4.1 and Table 2.3).

Table 2.3 Invasive vegetation and weeds identified on site

Scientific Name	CARA Category
<i>Melia azeredach</i>	Category 3 invader
<i>Jacaranda mimosifolia</i>	Category 3 invader
<i>Lantana camara</i>	Category 1 weed

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 literature study. However, the site was investigated to record fauna that is actually present as well as field signs of fauna present. The natural habitat is degraded and modified, with a loss of several important ecological components. The larger surrounding area has been transformed to informal settlements and agriculture lands and residential settlements, resulting in a loss of habitat and biota. Only very mobile fauna such as birds, reptiles and small mammals will be able to move around between habitats without difficulty and danger. Amphibians will be resident in the streams and wetlands. With view of the consequences of past and present impacts and the frequent daily human activities on and around the development site, it is expected that fauna sensitive to these disturbances and impacts have already moved away or have been lost due to poaching. It can therefore be expected that only taxa that are visitors or are unaffected by these impacts will be present. The fauna assemblage can be assumed to be severely impoverished and has a **Low** potential for fauna to utilize the habitat.

6. Sensitivity and Impact Assessment

6.1 Sensitivity rating

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

Vegetation Community	Sensitivity Rating
Secondary shrubland	Low-Medium
Watercourses	Low-Medium

It can be concluded that there are no sensitive ecological features or biota present on site that will be affected by the proposed activity. It is recommended that the riparian zone and floodplain of the river (that encroaches on to the proposed site) is protected by a 40m aquatic buffer zone as calculated by the DWS guidelines (2017). A 20m aquatic buffer is calculated for the drainage line on site.

6.2 Discussion and Impact assessment

The single most important impact on biodiversity as consequence of the clearing of indigenous vegetation is the loss of vegetation and loss and fragmentation of natural habitats and consequently the loss of fauna. However, the vegetation on site as well as the geomorphology has been subject to significant negative human induced modifications. The devastation caused to the environment as consequence of the sand mining and the modifications to the vegetation structure on site has reduced the habitat quality to such an extent that it can be considered as a suitable alternative site for this activity as opposed to sites located in natural habitat.

The impact assessment is provided in Table 3. The following method of assessment was used:

- 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.

7. Conclusion & recommendations

This investigation identified no sensitive ecological features or biota on site that will be affected by the proposed activity. From the perspective of this report, the site can be considered for the proposed activity. The loss and degradation of habitat has already occurred historically on site and in the general area and it is not likely that the current trend of encroaching settlements and transformation of land can be stopped or reversed.

- It is advised that the activities in the drainage line is rehabilitated / formalized.
- The riparian zone and floodplain of the river (that encroaches on to the proposed site) must be protected by a 40m aquatic buffer zone.
- A 20m aquatic buffer is calculated for the drainage line on site.
- The local municipality should monitor the area in order to address the seemingly uncontrolled, illegal sand mining activities in watercourses and elsewhere. The mitigation measures included with Table 3 must be enforced.

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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
Residential address: 01 Tambotie Street, Kingsview, White River.
Postal address: P.O. Box 2980, White River, 1240.
Telephone: (013) 256 9464 or 084 510 9054
Fax: 086 603 8875
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 centurms 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

Prof. G.J. Steyn. University of Johannesburg. Tel. 083 633 4665

L. Human, Eskom Distribution Northern Region, P.O. Box 36099, Menlo Park, 0102
Tel. 083 233 6727

M. Mbuyane, Wandima Environmental Consultants, PO Box 1072, Nelspruit, 1200
Tel. (013) 752 5452

R. Luyt, Mpumalanga Department of Agriculture and Land Administration, Directorate
Environmental Impact Management, Nelspruit
Tel. 082 672 7868

M. Lötter, Mpumalanga Tourism and Parks Agency: Scientific Services, Private Bag
X1088, Lydenburg, 1020
Tel. (013) 235 2395

T. Dormehl, Dormehl Technology, PO Box 21103, Nelspruit, 1200
Tel. (013) 741 1739

Dr. A. R. Deacon, National Parks Board, Skukuza, Kruger National Park
Tel. (013) 735 4237

J. Fourie & Associates, Environmental Engineers, PO Box 431, Paardekraal,
1739
Tel. (011) 954 1537

Dr. P. Van Eeden, EnviroScience, PO Box 1343, Norkem Park, 1631,
Tel. 083 279 4419

A. Van der Merwe, Maleka Environmental Consulting, PO Box 14850, West Acres,
Nelspruit, 1211
Tel. (013) 752 4231

APPENDIX 2: MBCP maps