Harvey Ecological

41 Devonshire Ave
Howick
3290
South Africa
Cell: +27 72 230 6188
Email: info@harveyecological.co.za

30 July 2022

Att: Anandi Alers (on behalf of Environmental Management Assistance (Pty) Ltd (EMA))

SPECIALIST DESKTOP HERPETOFAUNAL SITE SENSITIVITY VERIFICATION REPORT FOR THE VLAKFONTEIN MINING RIGHT AREA, MSUKALIGWA MUNICIPALITY

DECLARATION OF INDEPENDENCE BY THE PRINCIPAL SPECIALIST CONSULTANT

Herpetofauna Specialist			
Contact person:	James Harvey		
Postal address:	41 Devonshire Avenue, Howick		
Postal code:	3290	**Cell:**	072 230 6188
Email:	info@harveyecological.co.za		
Education Qualifications:	M EnvDev (Environmental Management) (UKZN) BSc (Hons) Hydro (UKZN), BSc Zool, Hydro (UKZN)		
SACNASP Reg. No.	118661 (Zoological Science) Professional Natural Scientist		

I, ____James Harvey_____ declare that I

- am an independent specialist consultant in this application;
- do not have and will not have any vested interest (either business, financial, personal or other) in the undertaking of the proposed activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2010;
- 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;
- declare that there are no circumstances that may compromise my objectivity in performing such work;
- have appropriate expertise in conducting biodiversity assessments;
- will provide the competent authority with access to all information at my disposal regarding this application, whether such information is favourable to the applicant or not;
- declare that all the particulars furnished by me in this form are true and correct;
- realise that a false declaration is an offence in terms of regulation 71 of the EIA Regulations, 2010 and is punishable in terms of section 24F of the National Environmental Management Act, 1998 (Act 107 of 1998); and
- will comply with all the requirements as indicated in the National Environmental Management Act, 1998 (Act 107 of 1998) and Environmental Impact Assessment Regulations, 2010.

_____

Signature of the specialist consultant

_James Harvey_____

Name of specialist consultant

_30 July 2022_____

Date

EXPERTISE

James Harvey of Harvey Ecological has nineteen years experience with biodiversity-related work and fifteen years experience in ecological consulting in sub-Saharan Africa. He is experienced and knowledgeable concerning species identification, ecology, conservation issues and methods for performing biodiversity assessments, and has performed biodiversity work widely in South Africa.

EXECUTIVE SUMMARY

INTRODUCTION

Harvey Ecological has been requested to perform an initial desktop sensitivity verification of herpetofaunal (reptile and frog) communities of the proposed Vlakvontein Coal Mine Site (Ptn 2, Ptn 11 and Ptn 21 of farm Vlakfontein 108 IT; Ptn 1, 7, 14, and 12 of farm Welgelegen 107 107 IT), to inform the required Scoping Report as part of the Scoping and Environmental Impact Assessment process. The site is situated 5km south-east of Breyten, Mpumalanga. The proposed development consists of an open-pit mining operation, with two mining pits and associated infrastructure, including offices, road networks and stockpile areas.

METHODS AND LIMITATIONS

The National Screening Tool identified two themes relevant to herpetofauna as being of significance.
These were evaluated based on current existing information relating to the fauna considered, and aerial imagery.

No site visit or examination of site photographs was possible for this assessment.

RESULTS

Screening Tool

Animal Species Theme: Rated – High
No specific herpetofauna were identified in the screening tool as Species of Conservation Concern, but two species that have recently been evaluated as Red Data – Near Threatened may be present, and are considered sensitive.

Terrestrial Biodiversity Theme: Rated – Very high
Sensitive terrestrial biodiversity features relating to herpetofauna were:
Critical Biodiversity Area (Irreplaceable) – portions of the site are classified as such, and herpetofaunal communities contribute to these areas' ecological communities and functioning
Vulnerable ecosystem – the site falls entirely within the Vulnerable Eastern Highveld Grassland Ecosystem. Herpetofaunal communities contribute to these areas' communities and functioning

Herpetofauna of the region

Reptiles – the natural habitats in the broader area supports a relatively rich reptile fauna, with several national endemics and habitat specialists. It may support two Near Threatened species (Coppery Grass Lizard *Chamaesaura aenea* and Striped Harlequin Snake *Homoroselaps dorsalis*).

Frogs - the broader area supports a moderate frog fauna, consisting mostly of fairly widespread species. The potential presence of wetland areas may mean that frog populations play an important part in local ecosystem functioning.

Herpetofaunal Habitat on site - Areas of apparently natural habitat are present within the study area and the proposed layout, and may provide important herpetofaunal habitat, although this should be examined on the ground. Other areas have been transformed by agricultural activities, and are of low herpetofaunal value.

CONCLUSION

On the basis of the findings, it is considered that portions of the site may be of high herpetofaunal sensitivity, and it is recommended that a full study, including site visit, habitat assessment and impact assessment take place.

Summary of Desktop Verification Outcome

SCREENING TOOL SENSITIVITY	VERIFIED SENSITIVITY	OUTCOME STATEMENT/PLAN OF STUDY	RELEVANT SECTION MOTIVATING VERIFICATION
ANIMAL IMPACT ASSESSMENT (HERPETOFAUNA)			
High	**Low-High (requires onsite verification)**	Full Impact Assessment	3. Results
TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT			
Very High	**Medium-Very High (requires onsite verification)**	Full Impact Assessment	3. Results

1 INTRODUCTION

Harvey Ecological has been asked to perform an initial desktop sensitivity verification of herpetofaunal communities of the proposed Vlakvontein Coal Mine Site (Ptn 2, Ptn 11 and Ptn 21 of farm Vlakfontein 108 IT; Ptn 1, 7, 14, and 12 of farm Welgelegen 107 107 IT), to inform the required Scoping Report as part of the Scoping and Environmental Impact Assessment process (S&EIA). The site is situated 5km south-east of Breyten, Mpumalanga. The proposed development consists of an open-pit mining operation, with two mining pits and associated infrastructure, including offices, road networks and stockpile areas (Figure 1).

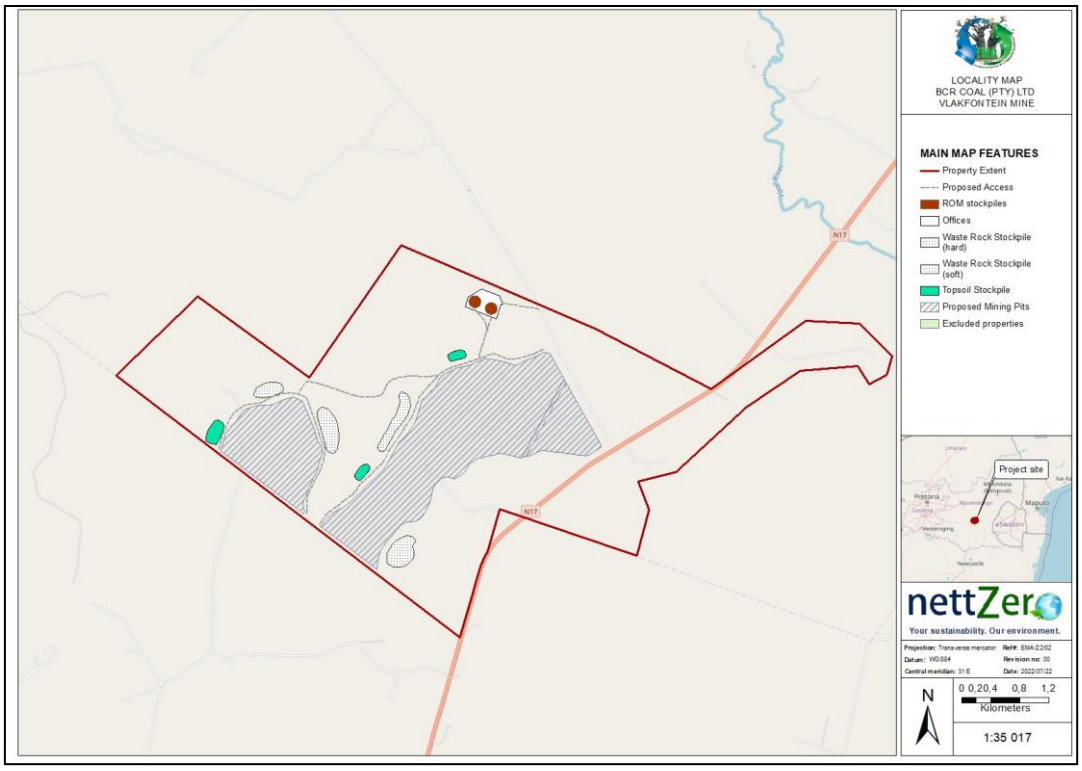

Figure 1. Location and layout of the proposed development.

2 METHODS

A Screening Report based on the National Environmental Screening Tool was generated as is required for an application for Environmental Authorisation, as per the Environmental Impact Assessment Regulations (2014). The Screening Report assesses the sensitivity of several environmental themes within the study area. The two themes relevant to herpetofauna that are assessed here are

1) Animal species assessment theme, and
2) Terrestrial biodiversity theme.

The Screening Report was generated on 10/06/2022.

The desktop site sensitivity verification was undertaken through the use of:

a) a desk top analysis, using Google-Earth satellite imagery;

b) available and relevant information, as relates to the fauna groups assessed
This included:

- strategic conservation tools,
- all available herpetofauna distribution and habitat requirement data. Much of this is available at the Quarter Degree Square (QDS) scale – given the incompleteness of existing data, records were drawn for the QDS incorporating the study site and adjacent QDS's, and
- a query to Mpumalanga Tourism and Parks Agency regarding any sensitive herpetofauna records within their database, in the QDS incorporating the study area (2630AC) and the closest QDS, immediately west of it (2629BD).

On the basis of these, the relevant features identified in the screening report are evaluated, and an initial assessment of the proposed site's sensitivity in terms of herpetofauna is made.

3 ASSUMPTIONS, LIMITATIONS AND KNOWLEDGE GAPS

- The primary limitation is that it has not been possible to visit the site, nor examine any photographs of the site.
- Herpetofauna remain under-surveyed in South Africa, and the broader area incorporating the study site has had moderate sampling historically. As a result, the species composition and spatial distribution of these fauna are incompletely known. This has to be acknowledged and expert opinion attempts to accommodate this limitation.

4 RESULTS

4.1 Screening Tool

Components of the screening tool evaluated were

- Animal species theme (rated High sensitivity)
- Terrestrial biodiversity theme (components related to herpetofauna) (rated Very high sensitivity)

4.1.1 Animal species theme features

No specific herpetofauna were indicated by the screening tool. However, there are species that may occur that have very recently been listed as Red Data – Near Threatened. These are discussed below.

4.1.2 Terrestrial biodiversity theme features

The following categories relate directly or indirectly to herpetofauna

Sensitivity	Feature(s)	Comments
Very High	Critical Biodiversity Area1 (Irreplaceable)	According to the Mpumalanga Biodiversity Sector Plan (Mpumalanga Parks and Tourism Agency 2014), the site consists of a matrix of areas identified as Critical Biodiversity Area (CBA): Irreplaceable, and moderately and heavily modified areas. Several development components, including both

		proposed mining pits, the offices, topsoil stockpiles and some of the road network fall within areas classified as CBAs. LÖtter (2015) defines CBA Irreplaceable areas as follows - 'Irreplaceable CBAs are the most important biodiversity areas in the Province, outside of the protected area network. This sub-category comprises those CBAs considered essential for meeting biodiversity targets to ensure the persistence of species and the functioning of ecosystems.' Herpetofauna are a key component of ecosystem communities and functioning.
Very High	Focus Areas for land-based protected areas expansion	Areas earmarked for protected area expansion do not incorporate the site.
Very High	Vulnerable ecosystem	The entire site falls within Eastern Highveld Grassland Ecosystem (Gm12) (Criterion A1:Vulnerable - Irreversible loss of habitat). No specific faunal issues, but natural ecosystems incorporate and protect natural herpetofaunal communities.

4.2 Herpetofaunal Communities

4.2.1 Reptiles

The site falls within an area of moderately rich reptile fauna, with 18 species recorded from the QDS and 47 species recorded from the broader area (Table 1) (ADU 2022, Bates et al. 2014). If habitat within the study site is fair – good, many of these species may be expected to occur there. Several of these are South African endemics, and many are habitat specialists (Table 1), restricted to good quality grassland. Two species listed as Red Data – Near Threatened have been recorded in the broader area and may occur within the study area.

Coppery Grass Lizard *Chamaesaura aenea*

Red Data – Near Threatened

This lizard is endemic to, and has a scattered distribution in eastern South Africa, where it is confined to higher altitude primary grassland in good condition. It is currently listed as Red Data – Near Threatened, as much of its grassland habitat has been transformed, fragmented or degraded by anthropogenic activities (Alexander et al. 2022). This species has been recorded in the adjacent QDS (2630AD) (ReptileMAP 2022, Bates et al. 2014), and may occur within the study area.

Striped Harlequin Snake *Homoroselaps dorsalis*

Red Data – Near Threatened

This snake is endemic to, and has a patchy distribution in eastern South Africa, where it is confined primarily to higher altitude primary grassland, typically with rocky outcrops or termitaria. It is currently listed as Red Data – Near Threatened, as much of its grassland habitat has been transformed, fragmented or degraded by anthropogenic activities and some subpopulations may have declined or gone extinct (Alexander et al. 2021). A record from the

adjacent QDS (2629BD) with no supporting data exists in the Mpumalanga Parks and Tourism database (M. Lötter pers. comm.), and there are other records surrounding the site. This is a poorly known and highly elusive species, and it may potentially be present within the study area.

4.2.2 Amphibians

The site falls within an area with a moderate frog fauna, with 14 species recorded from the QDS and 17 species recorded from the broader area (Table 1) (FrogMAP 2022, Minter et al 2004). A small number are endemic to South Africa, and only one may be considered a habitat specialist (Table 1), restricted to good quality grassland. No Red Listed species have been recorded or are expected to occur in the broader area or within the study area. The site appears to have wetland areas however, and may possibly support breeding populations of many of these species, which contribute to ecosystem processes and functioning.

Table 1. Herpetofauna recorded within the broader region incorporating the study area (Minter et al. 2004, Bates et al. 2014, ReptileMAP 2022, Frog MAP 2022).

Family	Scientific Name	English Name	Endemic	Habitat specialist	Recorded within 2630AC	Recorded within adjacent QDSs
Reptiles						
Pelomedusidae	*Pelomedusa galeata*	South African Marsh Terrapin			1	
Agamidae	*Agama aculeata distanti*	Distant's Ground Agama	1			1
Agamidae	*Agama atra*	Southern Rock Agama	1			1
Chamaeleonidae	*Chamaeleo dilepis*	Common Flap-neck Chameleon				1
Cordylidae	*Chamaesaura aenea*	Coppery Grass Lizard	1	1		1
Cordylidae	*Chamaesaura anguina*	Cape Grass Lizard		1		1
Cordylidae	*Cordylus vittifer*	Common Girdled Lizard	1	1	1	
Cordylidae	*Pseudocordylus melanotus melanotus*	Common Crag Lizard	1	1	1	
Gekkonidae	*Lygodactylus ocellatus*	Spotted Dwarf Gecko	1	1		1
Gekkonidae	*Pachydactylus vansoni*	Van Son's Gecko	1		1	
Gerrhosauridae	*Gerrhosaurus flavigularis*	Yellow-throated Plated Lizard				1
Lacertidae	*Nucras lallandii*	Delalande's Sandveld Lizard				1
Scincidae	*Acontias gracilicauda*	Thin-tailed Legless Skink	1			1
Scincidae	*Scelotes mirus*	Montane Dwarf Burrowing Skink	1	1	1	
Scincidae	*Trachylepis capensis*	Cape Skink				1
Scincidae	*Trachylepis punctatissima*	Speckled Rock Skink			1	
Scincidae	*Trachylepis varia sensu lato*	Common Variable Skink Complex			1	
Colubridae	*Crotaphopeltis hotamboeia*	Red-lipped Snake				1
Colubridae	*Dasypeltis inornata*	Southern Brown Egg-eater	1			1
Colubridae	*Dasypeltis scabra*	Rhombic Egg-eater			1	
Colubridae	*Dispholidus typus viridis*	Northern Boomslang				1
Colubridae	*Philothamnus hoplogaster*	South Eastern Green Snake				1
Colubridae	*Philothamnus occidentalis*	Western Natal Green Snake	1			1

Colubridae	*Philothamnus semivariegatus*	Spotted Bush Snake				1
Elapidae	*Elapsoidea sundevallii sundevallii*	Sundevall's Garter Snake	1	1		1
Elapidae	*Hemachatus haemachatus*	Rinkhals	1		1	
Lamprophiidae	*Amplorhinus multimaculatus*	Many-spotted Snake				1
Lamprophiidae	*Aparallactus capensis*	Black-headed Centipede-eater			1	
Lamprophiidae	*Boaedon capensis*	Brown House Snake				1
Lamprophiidae	*Duberria lutrix lutrix*	South African Slug-eater	1			1
Lamprophiidae	*Homoroselaps lacteus*	Spotted Harlequin Snake	1	1		1
Lamprophiidae	*Homoroselaps dorsalis*	Striped Harlequin Snake	1	1		1
Lamprophiidae	*Lamprophis aurora*	Aurora House Snake	1			1
Lamprophiidae	*Lamprophis fuscus*	Yellow-bellied House Snake	1	1		1
Lamprophiidae	*Lamprophis guttatus*	Spotted House Snake	1	1	1	
Lamprophiidae	*Lycodonomorphus inornatus*	Olive House Snake	1			1
Lamprophiidae	*Lycodonomorphus laevissimus*	Dusky-bellied Water Snake	1	1		1
Lamprophiidae	*Lycodonomorphus rufulus*	Brown Water Snake			1	
Lamprophiidae	*Lycophidion capense capense*	Cape Wolf Snake				1
Lamprophiidae	*Psammophis brevirostris*	Short-snouted Grass Snake				1
Lamprophiidae	*Psammophis crucifer*	Cross-marked Grass Snake	1			1
Lamprophiidae	*Psammophylax rhombeatus*	Spotted Skaapsteker			1	
Lamprophiidae	*Psammophylax tritaeniatus*	Striped Skaapsteker			1	
Lamprophiidae	*Pseudaspis cana*	Mole Snake			1	
Leptotyphlopidae	*Leptotyphlops scutifrons conjunctus*	Eastern Thread Snake	1		1	
Typhlopidae	*Afrotyphlops bibronii*	Bibron's Blind Snake	1	1	1	
Typhlopidae	*Rhinotyphlops lalandei*	Delalande's Beaked Blind Snake				1
Viperidae	*Bitis arietans arietans*	Puff Adder			1	
Viperidae	*Causus rhombeatus*	Rhombic Night Adder				
Amphibians						
Brevicepitidae	*Breviceps mossambicus*	Mozambique Rain Frog				1
Bufonidae	*Sclerophrys capensis*	Raucous Toad	1		1	

Bufonidae	*Sclerophrys gutturalis*	Guttural Toad			1	
Hyperoliidae	*Hyperolius semidiscus*	Yellowstriped Reed Frog	1			1
Hyperoliidae	*Kassina senegalensis*	Bubbling Kassina			1	
Hyperoliidae	*Semnodactylus wealii*	Rattling Frog	1	1	1	
Pipidae	*Xenopus laevis*	Common Platanna			1	
Ptychadenidae	*Ptychadena porosissima*	Striped Grass Frog			1	
Pyxicephalidae	*Amietia delalandii*	Delalande's River Frog			1	
Pyxicephalidae	*Amietia poyntoni*	Poynton's River Frog			1	
Pyxicephalidae	*Cacosternum boettgeri*	Common Caco			1	
Pyxicephalidae	*Pyxicephalus adspersus*	Giant Bull Frog				1
Pyxicephalidae	*Strongylopus fasciatus*	Striped Stream Frog			1	
Pyxicephalidae	*Strongylopus grayii*	Clicking Stream Frog	1		1	
Pyxicephalidae	*Tomopterna cryptotis*	Tremelo Sand Frog			1	
Pyxicephalidae	*Tomopterna natalensis*	Natal Sand Frog			1	
Pyxicephalidae	*Tomopterna tandyi*	Tandy's Sand Frog			1	

4.2.3 Habitat types and quality

The study area sits at approximately 1700masl, and the vegetation type that occurs here is classified as Eastern Highveld Grassland (Mucina and Rutherford 2006, 2019). Examination of the site on Google-Earth agrees broadly with the classification of the MBSP Terrestrial Plan, and shows that there is a mix of transformed landcovers and natural grassland vegetation. Within the grassland areas, it appears that there may be seasonal wetland depressions, which could support breeding frog populations. However, without a site visit or access to photographs, it is difficult to determine any further detail about the quality and detail of the habitats available within these areas. From a herpetofaunal perspective, transformed areas will be of low importance, while it is possible that the untransformed areas do have value.

5 PLAN OF STUDY FOR EIA PHASE

Based on the above, it is considered that the following should take place as part of the EIA phase:

- The study site is visited, and the diversity and quality of habitats present (with a focus on natural areas within and adjacent to proposed development footprints), together with the proposed layout are examined and their effect on herpetofauna considered;
- Feedback is given on the verified site sensitivity and anticipated impacts are assessed; and
- Mitigation measures are recommended if necessary.

6 REASONED OPINION REGARDING THE ACCEPTABILITY OF THE PROPOSED ACTIVITY

It is not possible to give a fully informed opinion regarding the proposed activity, without examining the site. Nevertheless, the presence of CBA – Irreplaceable areas within the proposed development footprint, together with the possible presence of natural herpetofauna communities contributing to local ecosystems, and potentially including endemic habitat specialists and Near Threatened species, suggests that impacts may be high and undesirable under the current layout, and require further investigation.

7 CONCLUSION

An initial desktop assessment suggests that the site is a mix of herpetofaunal sensitivities, with parts of it being of low value and some areas of higher value for herpetofauna. These higher value areas may include natural communities within CBA Irreplaceable areas, and among these may be habitat specialists and possibly two Near Threatened reptiles. Although these features aren't highlighted in the screening tool, the Near Threatened species in particular, have only recently been classified as such, and they are of potential sensitivity.

Given the CBA Irreplaceable classification of some areas, the possibility for diverse grassland herpetofaunal communities to be present, and the lack of onsite investigation to date, it is recommended that the sensitivity of the site from a herpetofaunal perspective be considered as medium-high, pending further investigation. It is recommended therefore that

a more detailed assessment of the herpetofaunal communities on site be performed as part of the full impact assessment study.

Summary of Desktop Verification Outcome

SCREENING TOOL SENSITIVITY	VERIFIED SENSITIVITY	OUTCOME STATEMENT/PLAN OF STUDY	RELEVANT SECTION MOTIVATING VERIFICATION
ANIMAL IMPACT ASSESSMENT (HERPETOFAUNA)			
High	**Low-High (requires onsite verification)**	Full Impact Assessment	3. Results
TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT			
Very High	**Medium-Very High (requires onsite verification)**	Full Impact Assessment	3. Results

8. REFERENCES

Alexander, G.J., Tolley, K.A., Weeber, J., Conradie, W., Maritz, B. & Pietersen, D. 2022. *Homoroselaps dorsalis*. *The IUCN Red List of Threatened Species* 2022.

Alexander, G.J., Conradie, W., Pietersen, D., Weeber, J., Bates, M.F. & Tolley, K.A. 2022. *Chamaesaura aenea*. *The IUCN Red List of Threatened Species* 2022

Bates, M.F., Branch, W.R., Bauer, A.M., Burger, M., Marais, J., Alexander, G.J. & de Villiers, M. 2014. *Atlas and Red List of the Reptiles of South Africa, Lesotho and Swaziland*. South African National Biodiversity Institute, Pretoria.

FrogMAP (2022). ReptileMAP: Reptile Atlas of Africa.
Published by the FitzPatrick Institute of African Ornithology, University of Cape Town.
Accessed at http://vmus.adu.org.za/?vm=FrogMAP

IUCN. 2022. IUCN Redlist of Threatened Species. https://www.iucnredlist.org/ Accessed July 2022.

Lötter, M. 2015. *Technical Report for the Mpumalanga Biodiversity Sector Plan – MBSP*. Mpumalanga Tourism & Parks Agency, Mbombela (Nelspruit).

Minter, L.R., M. Burger, J.A. Harrison, H.H. Braack, P.J. Bishop & D. Kloefder. (EDS.) 2004. *Atlas and Red Data Book of the Frogs of South Africa, Lesotho and Swaziland*. 9SI/MAB SERIES Smithsonian Institute, Washington, U.S.A.

Mpumalanga Tourism and Parks Agency. 2014. *MBSP Terrestrial Assessment*.

Mucina, L. & M.C. Rutherford. 2006. The Vegetation of South Africa, Lesotho and Swaziland. *Strelitzia*: (19).

Mucina, L. & M.C. Rutherford. 2019. Updated Vegetation Map of South Africa, Lesotho and Swaziland.

ReptileMAP (2022). ReptileMAP: Reptile Atlas of Africa.
Published by the FitzPatrick Institute of African Ornithology, University of Cape Town.
Accessed at http://vmus.adu.org.za/?vm=ReptileMAP

Personal Communication

Mervyn Lötter - Mpumalanga Tourism and Parks Agency