

Summary of reptile monitoring practical workshop and surveys conducted on the Palabora Copper properties.

**Phalaborwa, Limpopo Province.
09 – 13 February 2015.**



Joe Grosel (Pr.Sci.Nat)

**Tembele Ecological Services,
P.O. Box 699,
Fauna Park,
0787**

1. INTRODUCTION

Tembele Ecological Services was appointed by the South African Environmental Observation Network, (SAEON) to conduct a practical herpetological monitoring workshop for SAEON technicians on the Palabora Copper (Pty) properties and adjacent areas in the Kruger National Park. The workshop and associated surveys were carried out between the 9th and 13th of February 2015. The objective of the exercise was primarily to demonstrate herpetological survey and sampling methods and to introduce technicians to the reptile and frog species of the Phalaborwa region.

Several herpetofaunal surveys have been conducted on the copper mining properties south of Phalaborwa town and adjacent to the Kruger National Park. The most recent survey was conducted during the 2011 and 2012 summer period by J Grosel and L. Minter. The survey and capture sites used during that survey were again incorporated in this workshop/survey in order to supplement relevant data.

2. AIMS OF THE WORKSHOP

- To demonstrate reptile and frog survey and sampling techniques such as trapping and aural sampling to the relevant SAEON personnel to the point that similar herpetofaunal surveys and ongoing monitoring programs can be performed by technicians in the future.
- To conduct active search and aural surveys in as many previously-used sites as possible.
- To augment the dataset of the 2011/2012 surveys by performing frog and reptile sampling using the same methods.
- To identify additional survey sites that can be incorporated into future herpetofaunal survey programs.
- To discuss future herpetological sampling strategies.

3. METHODS

During the previous survey in 2011 and 2012, eight reptile trap sites were used, each in a specific habitat. For purposes of the workshop a single site was chosen to demonstrate the pit and funnel trap methods. This site, known as trap-site 4 (AS-4) in Mopane woodland (representing the Phalaborwa-Timbavati Mopaneveld vegetation unit) is located in the Cleveland area of the mine near the Kruger boundary fence line (S 24 00 18.5 E 31 12 36.2). A three-sided pit trap array with five meter drift fences was erected at the the same position used in 2011. This simple system comprised four, 20 litre buckets (3 placed at the ends and one in the middle of the array) and 500mm high plyboard drift fences. A single wire-mesh funnel trap was paced along on of the drift fences.

Of the 32 reptile active search sites used during the 2011/2012 surveys, 12 were revisited (Table 1) and active searches carried out. These were conducted by walking through the search areas, concentrating on sites likely to support reptiles e.g. in trees, under logs, in leaf litter, under loose bark and in rock crevices. Most species were identified on sight while smaller lizards were captured by hand. The search sites comprised an area of approximately 1 hectare and an average of 30 minutes was spent in each site. An additional four reptile search sites were surveyed in the Olifants River valley within the Kruger National Park.

Active search employed as a reptile survey method is fairly useful to determine species richness of terrestrial and arboreal reptiles but less effective for subterranean species. It's success is also determined by additional factors including climatic and weather conditions, size and proficiency of the search team and accessibility of the terrain.

For the frog assessments, visual encounter surveys (active searches) were performed at nine of the 31 previously surveyed sites. Four additional sites were also surveyed. Systematic, medium-intensity searches were carried out along the water's edge at the monitoring (breeding) sites. This involved scanning the surface of the ground by torchlight for exposed frogs, examining vegetation (grass tussocks and branches) and turning over logs, rocks and other objects under which they might be concealed. The surveys were conducted concurrently with the audio surveys between sunset (~18:30) and midnight, i.e. when the frogs were most active. Twenty to thirty minutes were spent at each site.

This method is useful for species richness evaluation in relatively open aquatic habitats, but has the following limitations: habitats with dense vegetation are surveyed less efficiently; its effectiveness is influenced by time of day and prevailing weather conditions; the presence of dangerous animals at night at the monitoring sites can compromise thorough searches.

4. RESULTS AND DISCUSSION

4.1. Reptiles

During the field surveys a total of 19 reptile species were recorded from 12 families. Only one reptile was captured in the pit trap in the form of a hatchling Bushveld Lizard *Heliobolus lugubris*. A total of 122 reptile observations were made during the active search surveys comprising 17 species (see table 2 for the comprehensive list). A further two species namely Flap-necked Chameleon *Chamaeleo dilepis* and Nile Crocodile *Crocodylus niloticus* were observed in random locations outside the active search sites. Chameleons were particularly common in the riverine and wooded habitats in the Olifants River valley. The fact that the Olifants River was flowing strongly, carrying large silt loads made crocodile observations difficult.

A single adult Van Dam's Girdled Lizard *Cordylus vandami* was recorded on a rocky outcrop in the operational area. This species was not observed during the 2011/2012 surveys.

4.2 Frogs

The results of the frog surveys have been summarised in a separate document drawn up by Mr. Rion Lerm from SAEON.

4.3. Concluding remarks

The exceptionally dry and hot conditions experienced during the workshop undoubtedly influenced reptile and frog activity. Very few true seasonal frog species were encountered and the majority of the species that were recorded were those that are inclined to utilise permanent water bodies. Despite the climatic conditions a good variety of reptiles were recorded albeit in lesser numbers than during the 2011/2012 surveys.

The recent surveys were of a relatively short duration and should be seen as the commencement of an ongoing survey of the Phalabrwa area. The presence of highly seasonal and uncommon species as well as population trends need to be established through long-term monitoring programmes which, after the completion of the recent workshop can now be conducted by the SAEON technicians.

5. ACKNOWLEDGEMENTS

Tembele Ecological Services wishes to thank Dr's. Tony Swemmer and Dave Thompson for initiating this herpetological monitoring workshop. My sincere appreciation goes to Mr. Rion Lerm for his excellent assistance throughout the exercise and to the staff of SAEON's Ndlovu node and volunteers who helped with the field work. Thanks also to Mr. Johan Mc Donald from Palabora Copper for his logistical support.

Table 1. Localities and descriptions of reptile active search sites (PMC Herpetological survey 2011 / 2012)
The highlighted sites were surveyed during the herpetological workshop conducted from 09 – 13 February 2014.

COORDINATES	PMC OPS AREA	CLEVELAND GP	LOCALITY / SITE NAME	SITE DESCRIPTION	
S 23 58 46.4	E 31 10 10.2		AS 1	About a 150m SE of gate 2 near the Merensky Estate fence	Mopani woodland with a artificial storm water drainage line
S 23 58 42.6	E 31 10 52.9		AS 2	Around and slightly north of North Dam	Fairly closed Mopani woodland
S 23 58 54.6	E 31 10 36.1		AS 3	300m South of Warthog Loop / Olifants Drive junction	Transitional zone between open shrubland and drainage line thicket
S 23 59 13.0	E 31 11 01.2		AS 4	Approximately 100m north-east of Sump-2	The edge of a marshy run-off
S 23 59 18.1	E 31 11 20.9		AS 5	Trig beacon North of Kudu Drive / Olifants Drive junction	Open shrubland with network of animal paths
S 23 59 21.2	E 31 11 54.2		AS 6	Mopani woodland near KNP fence line	Fairly dense Mopani woodland
S 23 59 41.8	E 31 12 21.2		AS 7	Drainage line and adjacent woodland near South Dam	Combination of sandy gullies, woodland and marshy areas
S 24 00 04.3	E 31 12 16.9		AS 8	Water trough and stream bed	Drinking trough in Mopani woodland and small storm water gully
S 24 01 13.2	E 31 11 30.0		AS 9	Syenite outcrop near trap site 3	Typical outcrop habitat - large boulders, loose rock and dense bush clumps
S 24 01 21.9	E 31 12 01.8		AS 10	Streambed and adjacent habitats near natural spring	Streambed at the base of a rocky outcrop which is fed by a natural spring
S 24 00 15.1	E 31 12 34.8		AS 11	Mopani woodland near trap site 4	Typical Mopani woodland with sparse ground cover
S 24 01 48.8	E 31 11 37.2		AS 12	Marshall Park day visitors site	Large riverine trees, cleared vegetation and buildings
S 24 01 55.4	E 31 11 50.5		AS 13	Olifants River Lodge grounds	Lodge buildings, riparian vegetation and granite boulders
S 24 01 30.4	E 31 11 32.1		AS 14	Rocky ridges west of Olifants Drive, north of Marshall Park	Rocky habitat in arid <i>Terminalia plurinoides</i> shrubland
S 24 02 10.4	E 31 12 06.2		AS 15	Dry floodplain in Olifants riverbed near trap site 1	Dry short-grassed, sandy, open areas within the Olifants riverbed
S 24 01 43.1	E 31 11 34.1		AS 16	Small rock outcrop north of Marshall Park	Syenite outcrop and adjacent building rubble dump site
S 24 02 23.4	E 31 12 30.5		AS 17	Riparian Forest along the Olifants River near trap site 2	Tall, established riparian forest
S 24 02 03.4	E 31 10 06.5		AS 18	Riparian habitats along the lower Selati River	Tall, open woodland and shoreline of the Selati River
S 24 00 31.4	E 31 12 22.2		AS 19	Syenite outcrop near along Impala Road	Typical outcrop habitat - large boulders, loose rock and dense bush clumps
S 24 01 16.9	E 31 10 29.5		AS 20	Rocky ridge east of trap site 6	Rocky ridge with a few large boulders in Olifants rugged veld
S 24 01 06.8	E 31 09 22.8		AS 21	Riparian thickets along upper Selati River	Dense thickets and river bed habitats along the upper Selati River
S 24 00 45.8	E 31 08 56.8	AS 22		Isolated outcrop on rock dump 4	Small Syenite outcrop surrounded by secondary Acacia growth
S 24 01 08.5	E 31 08 29.9	AS 23		Loole weir and surrounds	Small stream, standing water and surrounding rocky habitats
S 24 00 55.8	E 31 08 22.9	AS 24		Loole dam and surrounds	Open water and shoreline
S 24 00 10.0	E 31 08 56.8	AS 25		Western side of rock dump 4	Loose rock piles with sparse vegetation
S 23 58 56.2	E 31 08 47.9	AS 26		Loole Creek near trap site 8	<i>Acacia</i> and <i>Dichrostachys</i> thickets in the Loole drainage line
S 23 58 34.2	E 31 09 07.6	AS 27		Low outcrops near trap site 6	Disturbed areas on and around discoloured outcrops
S 23 58 03.4	E 31 09 08.2	AS 28		Thickets along main entrance road north of the main gate	Mixed shrubby thickets and cleared road verge
S 23 57 49.6	E 31 09 40.4	AS 29		Eastern section of the VO rock dump	<i>Acacia</i> and <i>Dichrostachys</i> thickets and loose rock piles
S 23 59 06.0	E 31 08 58.9	AS 30		Environmental Management office block and surrounds	Buildings and a few open patches with large <i>Sclerocarya</i> trees
S 23 59 10.3	E 31 11 25.9		AS 31	Midway down Kudu Drive	Mixed shrubby woodland and Mopane thicket
S 23 59 12.0	E 31 11 00.7		AS 32	Area surrounding southern tailings dam sump	Shoreline with rock and dead trees surrounded by mixed woodland

TABLE 2. REPTILES RECORDED IN THE ACTIVE SEARCH SITES ON PC PROPERTIES & THE ADJACENT KRUGER NATIONAL PARK DURING FEB 2015 SURVEYS.

(Search site numbers as per the 2011/2012 survey conducted by Grosel & Minter)

DATE	SURVEY TIME	COMMON NAME	GENUS	SPECIES	ADULT MALE	ADULT FEMALE	JUVENILE/ SUB ADULT	HATCHLING	TOTAL
Search site 05 (S 23 59 18.1 E 31 11 20.9) Trig beacon North of Kudu Drive / Olifants Drive junction									
11-02-2015	10h30	Variable Skink	<i>Trachylepis</i>	<i> varia </i>	1		1	1	3
11-02-2015	10h30	Bushveld Lizard	<i>Heliobolus</i>	<i> lugubris </i>	1		1		2
11-02-2015	10h30	Speckled Gecko	<i>Pachydactylus</i>	<i> punctatus </i>				1	1
11-02-2015	10h30	Western Yellow-bellied Sand Snake	<i>Psammophis</i>	<i> subtaeniatus </i>	1				1
Search site 09 (S 24 01 13.2 E 31 11 30.0) Seyenite outcrop and woodland to the west of trap site 3									
11-02-2015	17h45	Variable Skink	<i>Trachylepis</i>	<i> varia </i>	2		1	1	4
11-02-2015	17h45	Common (Cape) Dwarf Gecko	<i>Lygodactylus</i>	<i> capensis </i>	1				1
Search site 11 (S 24 00 15.1 E 31 12 34.8) Mopani woodland adjacent to KNP fence line and trap site 4									
10-02-2015	16h30	Variable Skink	<i>Trachylepis</i>	<i> varia </i>			3	1	4
10-02-2015	16h30	Common Rough-scaled Lizard	<i>Ichnotropis</i>	<i> squamulosa </i>	1				1
Search site 13 (S 24 01 55.4 E 31 11 50.5) Olifants River Lodge grounds									
10-02-2015	18h40	Common (Cape) Dwarf Gecko	<i>Lygodactylus</i>	<i> capensis </i>	2				2
10-02-2015	18h40	Turner's Gecko	<i>Chondrodactylus</i>	<i> turneri </i>	1		1	3	5
Search site 15 (S 24 02 10.4 E 31 12 06.2) Dry floodplain in Olifants riverbed near trap site 1									
10-02-2015	08h45	Striped Skink	<i>Trachylepis</i>	<i> striata </i>			1	2	3

DATE	SURVEY TIME	COMMON NAME	GENUS	SPECIES	ADULT MALE	ADULT FEMALE		HATCHLING	TOTAL
Search site 16 (S 24 01 43.1 E 31 11 34.1) Small rock outcrop north of Marshall Park									
11-02-2015	09h00	Common (Cape) Dwarf Gecko	<i>Lygodactylus</i>	<i>capensis</i>	1				1
11-02-2015	09h00	Rainbow (Rock) Skink	<i>Trachylepis</i>	<i>margaritifer</i>			1		1
Search site 18 (S 24 02 03.4 E 31 10 06.5) Riparian habitats along the lower Selati River									
11-02-2015	07h40	Common (Cape) Dwarf Gecko	<i>Lygodactylus</i>	<i>capensis</i>	2				2
11-02-2015	07h40	Variable Skink	<i>Trachylepis</i>	<i>varia</i>				1	1
11-02-2015	07h40	Striped Skink	<i>Trachylepis</i>	<i>striata</i>			1	1	2
Search site 19 (S 24 00 31.4 E 31 12 22.2) Syenite outcrops along Impala Road									
10-02-2015	06h15	Common Flat Lizard	<i>Platysaurus</i>	<i>intermedius</i>	1	3	2		6
10-02-2015	06h15	Giant Plated Lizard	<i>Gerrhosaurus</i>	<i>validus</i>	2		2		4
10-02-2015	06h15	Rainbow (Rock) Skink	<i>Trachylepis</i>	<i>margaritifer</i>	1	2	1	2	6
10-02-2015	06h15	Variable Skink	<i>Trachylepis</i>	<i>varia</i>	3			2	5
10-02-2015	06h15	Common (Cape) Dwarf Gecko	<i>Lygodactylus</i>	<i>capensis</i>	2				2
10-02-2015	06h15	Turner's Gecko	<i>Chondrodactylus</i>	<i>turneri</i>			1		1
10-02-2015	06h15	Speckled Gecko	<i>Pachydactylus</i>	<i>punctatus</i>			1		1
10-02-2015	06h15	Sundevall's Writhing Skink	<i>Mochlus</i>	<i>sundevallii</i>	1				1
Search site 22 (S 24 00 45.8 E 31 08 56.8) Isolated outcrop on rock dump 4 – ops area									
12-02-2015	06h45	Common Flat Lizard	<i>Platysaurus</i>	<i>intermedius</i>	2	9	3		14
12-02-2015	06h45	Giant Plated Lizard	<i>Gerrhosaurus</i>	<i>validus</i>	1				1
12-02-2015	06h45	Rainbow (Rock) Skink	<i>Trachylepis</i>	<i>margaritifer</i>	3	7		2	12
12-02-2015	06h45	Southern Tree Agama	<i>Acanthocercus</i>	<i>atricollis</i>		1			1
12-02-2015	06h45	Van Dam's Girdled Lizard	<i>Cordylus</i>	<i>vandami</i>	1				1
Search site 22.1 (S 24 00 45.8 E 31 08 56.8) Acacia shrubland surrounding isolated outcrop & on rock dump 4 – ops area									
12-02-2015	07h20	Western Yellow-bellied Sand Snake	<i>Psammophis</i>	<i>subtaeniatus</i>			1		1
12-02-2015	07h20	Common Rough-scaled Lizard	<i>Ichnotropis</i>	<i>squamulosa</i>			2		2

DATE	SURVEY TIME	COMMON NAME	GENUS	SPECIES	ADULT MALE	ADULT FEMALE	JUVENILE/ SUB ADULT	HATCHLING	TOTAL
Search site 25 (S 24 00 10.0 E 31 08 56.8) Western side of rock dump 4.									
12-02-2015	08h20	Variable Skink	<i>Trachylepis</i>	<i>varia</i>		1		1	
Search site 29 (S 23 57 49.6 E 31 09 40.4) Eastern side of the VO rock dump									
12-02-2015	10h00	No reptile species recorded							
Search site 32 (S 24 00 54.8 E 31 11 33.7) Area surrounding southern tailings dam sump									
12-02-2015	18h30	Variable Skink	<i>Trachylepis</i>	<i>varia</i>	1		2	1	4
12-02-2015	18h30	Striped Skink	<i>Trachylepis</i>	<i>striata</i>		1	1		2
12-02-2015	18h30	Rainbow (Rock) Skink	<i>Trachylepis</i>	<i>margaritifera</i>	1	5			6
12-02-2015	18h30	Giant Plated Lizard	<i>Gerrhosaurus</i>	<i>validus</i>		1			1
12-02-2015	18h30	Common Flat Lizard	<i>Platysaurus</i>	<i>intermedius</i>	1	2			3
ADDITIONAL ACTIVE SEARCH SITES									
Search site 33 (S 24 01 74.9 E 31 11 38.5) Small stream west of Marshall Park that crosses the road (fed from tailings dam)									
11-02-2015	18h45	Marsh Terrapin	<i>Pelomedusa</i>	<i>subrufa</i>	2		3		5
11-02-2015	18h45	Nile Monitor Lizard	<i>Varanus</i>	<i>niloticus</i>			1		1
Search site 34 (S 24 00 59.27 E 31 12 75.3) First junction to the east down fence line road in KNP									
13-02-2015	06h30	Variable Skink	<i>Trachylepis</i>	<i>varia</i>	2		1	3	6
Search site 35 (S 24 02 43.7 E 31 12 86.2) Riparian woodland at Mamba Picket (KNP)									
13-02-2015	07h20	Striped Skink	<i>Trachylepis</i>	<i>striata</i>			1		1
13-02-2015	07h20	Common (Cape) Dwarf Gecko	<i>Lygodactylus</i>	<i>capensis</i>	2				2
13-02-2015	07h20	Southern African Python	<i>Python</i>	<i>natalensis</i>	Trail of young python identified				1

DATE	SURVEY TIME	COMMON NAME	GENUS	SPECIES	ADULT MALE	ADULT FEMALE	JUVENILE/ SUB ADULT	HATCHLING	TOTAL
Search site 36 (S 24 04 56.0 E 31 15 04.0) Approximately 1km west of Olifants/Klaserie confluence (KNP)									
13-02-2015	08h15	Bushveld Lizard	<i>Heliobolus</i>	<i>lugubris</i>	1		2	7	10
13-02-2015	08h15	Striped Skink	<i>Trachylepis</i>	<i>striata</i>	3		3	1	7
13-02-2015	08h15	Common (Cape) Dwarf Gecko	<i>Lygodactylus</i>	<i>capensis</i>	1				1
13-02-2015	08h15	Variable Skink	<i>Trachylepis</i>	<i>varia</i>				1	1
Search site 36 (S 24 04 55.5 E 31 15 32.0) Opposite Olifants/Klaserie confluence (KNP)									
13-02-2015	08h50	Striped Skink	<i>Trachylepis</i>	<i>striata</i>			2	1	3
13-02-2015	08h50	Bushveld Lizard	<i>Heliobolus</i>	<i>lugubris</i>	2		1	6	9
13-02-2015	08h50	Rainbow (Rock) Skink	<i>Trachylepis</i>	<i>margaritifera</i>			1	1	2
13-02-2015	08h50	Leopard Tortoise	<i>Stigmochelys</i>	<i>pardalis</i>	1				1