

HERPETOFAUNA OF THE LOWER CUITO AND CUANDO RIVER

A report on a rapid biodiversity survey conducted in April 2013



Prepared by
Werner Conradie (M. Env. Sc)*
Museum Natural Scientist - Herpetologist
Port Elizabeth Museum (Bayworld)
P.O.Box 13147
Humewood
Port Elizabeth
6013

Tel: +27 (41) 5840 650
Fax: +27 (41) 5840 661
E-mail: werner@bayworld.co.za



* Werner Conradie has a Masters in Environmental Science (M.Env.Sc), specialising in Herpetology and Zoology in general with 8 years experience.

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1. BACKGROUND

The herpetofauna of Angola remains one of the most poorly documented on the African continent. The only synthesis dates from the 19th Century (Bocage 1895) and this is now very out-of-date. Due to the protracted civil war, modern biodiversity surveys in the country are just beginning, (e.g. Huntley 2009 & 2011, Brooks 2012, Conradie 2012a) and large areas of the country have never been scientifically surveyed. Most previous reports on the country's herpetofauna have been restricted to the western or southern regions, e.g. Boulenger (1905), Monard (1931, 1937), Schmidt (1933), Parker (1936), Mertens (1938), Bogert (1940), Hellmich (1957a,b), FitzSimons (1959), Branch & McCartney (1992) and Poynton & Haacke (1993). An exception to the regional neglect of the herpetofauna of northeast Angola is a series of reports in by Laurent (1950, 1954, & 1964), based on collections in the Museo du Dundo. Recent modern biodiversity surveys (Huntley 2009 & 2011) led to the description of four new endemic species of reptiles and amphibians from Angola (Conradie *et al.* 2012 b, c & 2013) and resolving ongoing taxonomical confusion (Channing *et al.* 2013, Channing & Baptista 2013).

No formal surveys had been undertaken to the Cubango-Okavango river catchments, except of some random collections reported by Bocage (1889), Monrad (1930, 1937), Laurent (1964), Branch & McCartney (1992) and most recently Conradie *et al.* (2012a, 2013). The only herpetological surveys undertaken in the Cuito and Cuando River area is by Branch & McCartney (1992) and Conradie (2012a), with some historical records by Monrad (1937)

Reptiles and amphibians are declining globally because of habitat loss and degradation, alien invasive species, environmental pollution, disease, unsustainable use and global climate change (Gibbons *et al.* 2000). It has also been shown that management actions within protected areas can affect herpetofaunal ecology (Measey *et al.* 2009, Russel *et al.* 1999). The recording of baseline biodiversity information on these groups is thus a critical component of conservation management of protected areas. This data assists in informed decision support, measurement of conservation management effectiveness, and forms baselines for measurement of the effect of global climate change (Kessler *et al.* 2011).

2. METHODS

The current herpetological survey was undertaken by Werner Conradie, based at Port Elizabeth Museum (Bayworld), South Africa. Field assistance was provided by Sven Bourquin (SAREP). Opportunistic specimens were also collected by other members of the survey, particularly during the fish surveys (especially Roger Bills and Nkosinathi Mazungula (SAIAB). Two standard Y-shape traplines were employed, but most collections were made by active searching. Amphibian call surveys were done using a Nagra ARES-ML digital recording device and a Sony F-V4T Microphone. The following literature was consulted to compile historical records for the study area: Monrad (1937), Branch & McCartney (1998) and Conradie (2012a). Collections of specimens have been deposited in Port Elizabeth Museum (South

Africa) and South African Aquatic Biodiversity Institute (South Africa) and a representative collection will be returned to Angola.

3. STUDY AREA

During the period 12 April – 1 May we undertook a herpetological survey of the lower reaches of the Cuito and Cuando River (Figure 1).

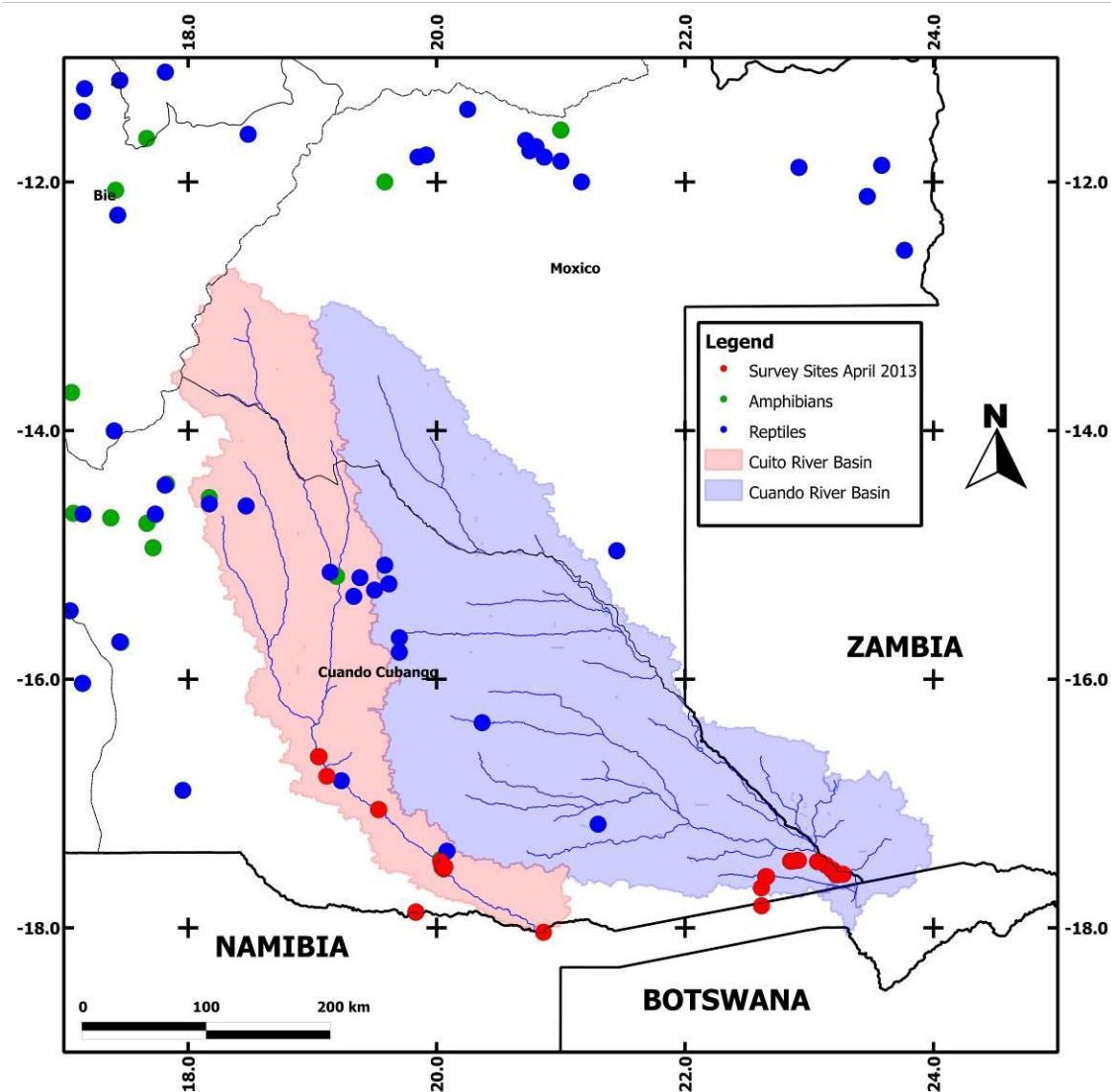


Figure 1. Map indicating the Cuito and Cuando River Basins. Red dots represent the latest survey collection sites.

4. AMPHIBIAN AND REPTILE SPECIES LISTS

The following are updated species lists for amphibians and reptiles based on historical records as well as data from the new survey within the boundaries of the Cuito and Cuando river basin. The IUCN- Redlist Categories are: NE = Not evaluated and LC = Least concern. Type of sample: V = Voucher, A = Auditory, T = Tadpole, O = Observation, L = Literature record.

AMPHIBIANS							
Genus	Species	Common Name	Survey	Cuito River	Cuando River	IUCN	Reference
BUFONIDAE							
<i>Amietophryne</i>	<i>gutturalis</i>	Guttural Toad*	V, A	X	X	LC	
<i>Amietophryne</i>	<i>lemairei</i>	Lemaire's Toad*	V, T, A	X		LC	
<i>Amietophryne</i>	<i>maculatus</i>	Flat-backed Toad*	V, L	X		LC	Conradie 2012
<i>Amietophryne</i>	<i>poweri</i>	Western Olive Toad*	V	X		LC	
HYPEROLIIDAE							
<i>Hyperolius</i>	<i>angolensis</i> complex	Angolan Reed Frog*	V, A, T, L	X	X	LC	Monrad 1937
<i>Hyperolius</i>	<i>benguellensis</i>	Benguella Reed Frog*	V, A, L	X	X	LC	Conradie 2012
<i>Kassina</i>	<i>senegalensis</i>	Bubbling Kassina*	V, T, L	X	X	LC	Conradie 2012
PHRYNOBATRACHIDAE							
<i>Phrynobatrachus</i>	<i>mababiensis</i>	Dwarf Puddle Frog*	V, A	X	X	LC	
<i>Phrynobatrachus</i>	<i>parvulus</i>	Small Puddle Frog*	V, A		X	LC	
PTYCHADENIDAE							
<i>Ptychadena</i>	<i>guibei</i>	Guibe's Grass Frog*	V	X	X	LC	
<i>Ptychadena</i>	<i>mascareniensis</i>	Mascarene Grass Frog*	V, L	X		LC	Conradie 2012
<i>Ptychadena</i>	<i>oxyrhynchus</i>	Sharp-nosed Grass Frog*	V		X	LC	

<i>Ptychadena</i>	<i>subpunctata</i>	Speckled-bellied Grass Frog*	V, L	X	X	LC	Conradie 2012
<i>Ptychadena</i>	<i>cf. schillukorum</i>	Schilluk Grass Frog	V		X	LC	
<i>Ptychadena</i>	<i>taenioscelis</i>	Dwarf Grass Frog*	V, A	X		LC	
PIPIDAE							
<i>Xenopus</i>	<i>muelleri</i>	Müller's Clawed Frog*	V	X	X	LC	
<i>Xenopus</i>	<i>petersi</i>	Peter's Clawed Frog*	V		X	LC	
PYXICEPHALIDAE							
<i>Tomopterna</i>	<i>cryptotis</i>	Tremelo Sand Frog*	V	X		LC	
Total:			18	14	12		

* sampled during the current survey

REPTILES

Genus	Species	Common Name	Survey	Cuito River	Cuando River	IUCN	Reference
ORDER: SQUAMATA							
COLUBRIDAE							
<i>Crotaphopeltis</i>	<i>hotamboeia</i>	White-lipped Herald Snake	L	X		NE	Branch & McCartney 1992
<i>Dispholidus</i>	<i>typus punctatus</i>	Boomslang	L	X		NE	Branch & McCartney 1992
<i>Limnophis</i>	<i>bangweolicus</i>	Eastern Striped Swamp Snake*	V		X	NE	
<i>Natriciteres</i>	<i>olivacea</i>	Olive Marsh Snake*	V		X	NE	
ELAPIDAE							
<i>Naja</i>	<i>mossambica</i>	Mozambique Spitting Cobra*	V	X	X	NE	
LAMPROPHIIDAE							
<i>Aparallactus</i>	<i>capensis</i>	Cape Centipede Eater	L		X	NE	Branch & McCartney 1992
<i>Gonionotophis</i>	<i>capensis</i>	Cape File Snake	L	X		NE	Branch & McCartney 1992
<i>Lycophidion</i>	<i>multimaculatum</i>	Spotted Wolf Snake	L		X	NE	Branch & McCartney 1992

<i>Psammophis</i>	<i>jalle</i>	Jale's Sand Snake	L		X	NE	Monard 1937
<i>Psammophis</i>	<i>phillipsi</i>	Phillip's Sand Snake	L		X	NE	Branch & McCartney 1992
<i>Psammophis</i>	<i>subtaeniatus</i>	Stripe-bellied Sand Snake*	V		X	NE	
<i>Psammophylax</i>	<i>tritaeniatus</i>	Striped Skaapsteiker*	L	X		NE	Conradie 2012
<i>Xenocalamus</i>	<i>mechowii inornatus</i>	Elongate Quill-snouted Snake	L		X	NE	Branch & McCartney 1992
PYTHONIDAE							
<i>Python</i>	<i>natalensis</i>	African Rock Python*	V	X		CITES II	
VIPERIDAE							
<i>Bitis</i>	<i>arietans</i>	Puff Adder*	V, L		X	NE	Branch & McCartney 1992
AMPHISBAENIDAE							
<i>Dalophia</i>	<i>pistillum</i>	Worm Lizard	L		X	NE	Branch & McCartney 1992
<i>Zygaspis</i>	<i>quadrifrons</i>	Kalahari Round-snouted Worm Lizard*	V		X	NE	
VARANIDAE							
<i>Varanus</i>	<i>niloticus</i>	Water Monitor Lizard*	O	X	X	CITES II	
CHAMAELEONIDAE							
<i>Chamaeleo</i>	<i>dilepis</i>	Flap-neck Chameleon*	O, L	X	X	CITES II	Monard 1937
SCINCIDAE							
<i>Acontias</i>	<i>jappi</i>	Northern Striped Legless Skink*	V		X	NE	
<i>Afroablepharus</i>	<i>wahlbergi</i>	Whalberg's Snake-eyed Skink*	V		X	NE	
<i>Mochlus</i>	<i>sundevalli</i>	Sundevall's Writhing Skink*	V		X	NE	
<i>Sepsina</i>	<i>angolensis</i>	Angola Skink	L		X	NE	Branch & McCartney 1992
<i>Trachylepis</i>	<i>Varia</i>	Variable Skink*	V	X	X	NE	
							Monrad 1937; Branch & McCartney 1992; Conradie
<i>Trachylepis</i>	<i>wahlbergi</i>	Wahlberg's Striped Skink*	V, L	X	X	NE	2012
<i>Typhloacantias</i>	<i>rohani</i>	Rohan's Dwarf Skink*	V, L		X	NE	Monrad 1937

GEKKONIDAE

<i>Chondrodactylus</i>	<i>turneri</i>	Turner's Thick-toed Gecko*	V	X	NE
<i>Lygodactylus</i>	<i>angolensis</i>	Angola Dwarf Gecko*	V	X	NE

GERRHOSAURIDAE

<i>Gerrhosaurus</i>	<i>nigrolineatus</i>	Black-lined Plated Lizard*	V, L	X	NE	Monrad 1937
<i>Tetradactylus</i>	<i>ellenbergi</i>	Ellen's Whip Lizard	L	X	NE	Conradie 2012

LACERTIDAE

<i>Ichnotropis</i>	<i>capensis</i>	Cape Rough-scales Lizard*	L	X	X	NE	Branch & McCartney 1992
<i>Ichnotropis</i>	<i>grandiceps</i>	Caprivi Rough-scaled Lizard	L	X		NE	Conradie 2012
<i>Meroles</i>	<i>squamulosa</i>	Common Rough-scaled Lizard*	V	X		NE	

CROCODYLIIDAE

<i>Crocodylus</i>	<i>niloticus</i>	Nile Crocodile*	L, O	X	X	LC, CITES II	Branch & McCartney 1992
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ORDER: TESTUDINES**PELOMEDUSIDAE**

<i>Pelusios</i>	<i>bechuanicus</i>	Okavango Hinged Terrapin*	V	X	NE
<i>Pelomedusa</i>	<i>subrufa</i>	African Helmeted Terrapin*	V	X	NE

TESTUDINIDAE

<i>Stigmochelys</i>	<i>pardalis</i>	Leopard Tortoise*	O	X	CITES II
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Total:**37 16 28**

*sampled during the current survey

5. RESULTS

A total of 55 species of amphibians and reptiles have been recorded from the study area to date. During the April 2013 survey 12 new amphibian and 17 new reptile records were added to the study area (see species lists Heading 4). Figure 1 indicates the collecting gap in the herpetofauna of Angola that the current survey filled.

5.1 Cuito River Basin

In total 30 species of amphibians and reptiles were associated with the Cuito river basin catchments to the west of the study area.

5.2 Cuando River Basin

In total 40 species of amphibians and reptiles were associated with the Cuito river basin catchments to the west of the study area

5.3 Important Discoveries

Although relatively few reptiles were collected, the survey revealed a number of exciting discoveries, including:

- 1st record of *Acontias kgalagadi* [= *Typhlosaurus lineatus*] for Angola. According to Broadley (1986) only *A. jappi*, sister species to *A. kgalagadi*, occurs north of the Cubango-Okavango and the Zambezi River. This is thus the first record north of the Cubango-Okavango River and might be more widespread in the south-eastern sandier Angola.
- 2nd record of *Naja mossambica* for Angola, the only other record is from Maconjo (Broadley 1974). Bill Branch (pers comm.) collected another specimen in south-western Angola in December 2013. This species is expected to be more widely distributed in southern Angola.
- 2nd record for *Limnophis bangweolicus*, the other record is 700 km north to Calundo (Moxico Province). Its sister species, *Limnophis bicolor*, is more widespread in western, central and northern Angola.
- 2nd record of the Okavango Hinged Terrapin (*Pelusios bechuanicus*) for Angola. The only other record for Angola is from Chonga River, Moxico Province (Laurent 1964), 700 km to the north.
- 3rd record for *Meroles* (= *Ichnotropis*) *squamulosa* from Angola. The phylogenetic relationship among *Meroles* and *Ichnotropis* is underway and may represent many undescribed lineages.
- 3rd record for *Typhloacontias rohani*. The type locality of this species is Lwankundu River, an western tributary of the Kwando River. The only other record for Angola is from Chimporo (Monrad, 1937). Haacke (1997) reports this species to be common in north-eastern Namibia, the Caprivi Strip, northern Botswana and western Zimbabwe.
- The following 16 species are new for the study area (see Heading 4): *Acontias jappi*, *Limnophis bangweolicus*, *Natriciteres olivacea*, *Psammophis subtaeniatus*, *Python*

natalensis, *Zygaspis quadrifrons*, *Varanus niloticus*, *Afroablepharus wahlbergi*, *Mochlus sundevalli*, *Trachylepis varia*, *Chondrodactylus turneri*, *Lygodactylus angolensis*, *Meroles squamulosa*, *Pelusios bechuanicus*, *Pelomedusa subrufra* and *Stigmochelys pardalis*.

Amphibian activities was reduced. Most species had already bred, although some individuals were still present. Winter breeding species were abundant. The following exciting discoveries were made:

- Lemaire's Toad (*Amietophrynu lemairii*) is a very unusually toad that is adapted to living in flood plains. It is restricted to Angola, the Caprivi Strip (Namibia), the Okavango delta (Botswana) and floodplains in Zambia and Democratic Republic of the Congo. The life history (breeding, call and tadpoles) of this species was previously unknown. During the current survey we collected natural history data and are in the process of preparing this for publication.
- Unusual examples of a Grass Frog (*Ptychadenia* sp) and a Puddle Frog (*Phrynobatrachus* sp.) were collected. DNA samples had been send for barcoding to access their taxonomic affinities.
- The following 12 amphibians are new records for the study area (see Heading 4): *Amietophrynu gutturalis*, *Amietophrynu lemairii*, *Amietophrynu poweri*, *Phrynobatrachus mababiensis*, *Phrynobatrachus cf. parvulus*, *Ptychadena guibei*, *Ptychadena oxyrhynchus*, *Ptychadena cf. schillukorum*, *Ptychadena taenioscelis*, *Xenopus muelleri*, *Xenopus petersii*, *Tomopterna cryptotis*.

6. CONCLUSION

Unfortunately reptile and amphibian activity during the survey period was relatively quiet as breeding activity had declined and many species were entering a period of seasonal dormancy. The present collection made only a preliminary assessment of amphibian and reptiles diversity in the region, and future surveys can be expected to considerably increase the regional diversity. Further surveys in different seasons need to be conducted to give a more accurate idea of species richness and abundance to allow great prediction of any conservation implications.

7. ACKNOWLEDGMENTS

I would like to thank Professor Bill Branch in providing expert advice, confirming species identifications and proof reading this report.

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ADDENDUM: PHOTOS OF IMPORTANT AMPHIBIANS AND REPTILES



Lemaire's Toad (*Amietophryne lemairii*)



Unidentified Grass Frog (*Ptychadena* sp.)



Unidentified Puddle Frog (*Phrynobatrachus* sp.)



Okavango Mud Terrapin (*Pelusios bechuanicus*)



Striped Swamp Snake (*Limnophis bangweolicus*)



Olive Marsh Snake (*Natriciteres olivacea*)



Leopard Tortoise (*Stigmochelys pardalis*)



Kalahari Round-headed Worm Lizard (*Zygaspis quadrifrons*)



Kalahari Burrowing Skink (*Typhlacontias rohani*)



Striped Blind Legless Skink (*Acontias kgalagadi*)