

CHIPANGALI WILDLIFE TRUST

CARNIVORE RESEARCH INSTITUTE (CRI)

Up-date of all Research Projects December 2006

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PREAMBLE

This report is an update of the projects that have been running for several years. Most of these are now nearing completion and then the hard task of evaluating the data collected and writing scientific publications follows. A lot of this will take place in 2007. Some work in this direction has already begun by the completion of a publication on the Reptiles and Amphibians of the Matobo Hills and another on the Scorpions of the same area.

Monitoring of radio-collared leopards, cheetah and brown hyaena will continue for another year and then the results of the field work will be written up.

The project on the food and feeding habits of the leopards in the Matobo Hills has come to an end and a publication will be produced in 2007.

The biodiversity survey of the Matobo Hills World Heritage Site will continue for another six months and will then stop.

A new project – Children's Conservation Education Programme started during 2006 with the employment of ecologist Joice Ndlovu. She has already made a start by producing booklets on various carnivores and visited a number of schools. She has also visited the Matopos each month for 10 days.

The project on a leopard and cheetah survey of Zimbabwe has been slow in taking off mainly due to the fact that the Parks & Wildlife Management Authority still have not seconded an ecologist to the project as promised.

This report also includes three other brief reports. Two from NUST students and one from the CRI ecologist.

2006 has indeed been a very busy year. I have made 10 trips to the Matopos, four to Hwange, seven to Botswana to get supplies, three to Harare, three to South Africa, one to the Honde Valley to do a reptile survey and several to farms and ranches as part of the leopard and cheetah survey.

I do hope that 2007 is going to be a less hectic year.

Viv Wilson.

PROJECT NO 1: THE FOOD AND FEEDING HABITS OF THE LEOPARD (*Panthera pardus*) IN THE MATOBO NATIONAL PARK, AS DETERMINED BY SCAT ANALYSIS

This project has been unbelievably successful and during 2006 additional scats were collected and new areas added as collection locations.

Again for most of the year we had the assistance of two Wildlife attachment students from the National University of Science & Technology (NUST). In addition the CRI Wildlife Ecologist, Miss Joice Ndlovu and driver Collen Khumalo, collected hundreds of piles of droppings during their monthly visits of 10 days to the Hills.

New areas in which leopard scats were collected were added to the places already sampled (See Map 1). A large amount of time was spent by all CRI staff, NUST students and volunteers working and sieving through hundreds of piles of droppings and retaining and preserving all identifiable fragments of bone and teeth and large quantities of hair from the scats.

By the end of 2006 all of the 4,382 piles of droppings collected had been washed and sieved and 90% of the identifiable parts determined. The project has now definitely come to an end and the results will be published in a recognized scientific journal during 2007.

Tables 1 – 3 gives details of the number of scats collected over the five year period, details of each transect covered and number of piles of droppings collected on each transect.

In addition to the leopard scats collected another 11 carcasses of animals killed by leopards were located. These consisted of three klipspringer, one common duiker, three dassies, one baby zebra and three impala.

PROJECT NO 2: THE HOME RANGE AND MOVEMENTS OF RADIO-COLLARED LEOPARDS (*Panthera pardus*) IN THE MATOBO NATIONAL PARK

Details of each of the seven radio-collared animals are given below:

No 1: “Nswatugi” - Female, captured 6th May 2002

Details of the movement of this female were recorded for over two years during which time she was located on 291 occasions. The batteries in her radio-collar expired in June 2004 and therefore we could no longer track her movements. However, she has since been seen on numerous occasions not only by our CRI staff working in the Park, but also by visitors to the Park and staff of the Parks and Wildlife Management Authority. There is evidence that from the time she was captured in May 2002 until 31st December 2006 she has produced two litters of cubs. Each litter consisted of two young. On one occasion she was photographed with her two large cubs by Mr. Chris Pfefferkorn from the Oregon Zoo.

A very detailed understanding of her home range and movement is now available and results will be published in the near future.

No 2: “Inungu” – Female, captured 9th October 2002

This female has been an extremely easy animal to follow and a very accurate picture of her home range and movements has been obtained. Almost every time that we went out looking for her she could be accurately located – but very seldom seen.

The batteries in her radio-collar expired in December 2004 and we were lucky enough to record her movements for 27 months. During the period October 2002 to December 2004 she was located on 221 occasions. This female was often recorded on Mineral King Farm north of the National Park where she was also seen by the farm workers on many occasions.

As with “Nswatugi” her home range and movements has been accurately determined. In June 2006 she was seen with two cubs on the Mineral King Farm by one of the workers there. The worker described the leopard “as an animal with a funny collar around its neck” and indicated that the cubs were as high as a “small dog”. The sighting must have been of “Inungu” as we know for sure that there were no other radio-collared leopards in that area.

**Table 1 – Total number of piles of leopard scats collected
(1 January 2002 – 31 December 2006)**

2002	-	420	piles
2003	-	810	“
2004	-	1400	“
2005	-	606	“ (Jan – Sept)
	-	81	“ (Oct – Dec)
2006	-	<u>1065</u>	“
TOTAL		<u>4382</u>	piles of droppings in five years.

**Table 2 – Details of transects covered on which leopard scats were collected
(See Map)**

Transect No. 1	-	Maleme Valley – From Maleme Dam along gravel road to Inungu Hill and out of the Park onto Mineral King Farm.
“ No. 2	-	Nswatugi Road – On main gravel road from Maleme to Whitewaters starting at Nswatugi turnoff along Nswatugi Road to bottom of concrete ramp at Nswatugi Hill.
“ No. 3	-	Scenic Road – From Maleme tar road long gravel road (Scenic Drive) to Circular Road.
“ No. 4	-	Kezi Tar Road – From Park boundary north along Kezi Road to “Old Hermits Peak”.
“ No. 5	-	Mpopoma Dam/Lushongwe Platform – From Mpopoma Dam wall north along gravel road to Lushongwe Platform.
“ No. 6	-	Whitewaters to Maleme Dam – From main Kezi Tar Road at Whitewaters along gravel road to Maleme Dam wall.
“ No. 7	-	Mtshелеle Valley – From Mtshелеle Dam north along old road along Mtshелеle Valley for 6kms.
“ No. 8	-	Togwana Dam – along very rough gravel road from Togwana Dam/Mtshелеle Dam Road along short cut to main Maleme Tar Road.

Table 3 – Number of piles of scats collected on transects

Transect No. 1	Maleme Valley	-	1154	(5 years)
“ No. 2	Nswatugi Road	-	1539	(5 years)
“ No. 3	Scenic Drive	-	516	(4 years)
“ No. 4	Kezi Tar Road	-	39	(1 year)
“ No. 5	Mpopoma/Lushongwe Road	-	431	(2 years)
“ No. 6	Whitewaters/Maleme Road	-	69	(5 years)
“ No. 7	Mtshелеle Valley	-	513	(2 years)
“ No. 8	Tongwana Area	-	<u>121</u>	(2 years)
	TOTAL		<u>4382</u>	Piles of Scats

**No 3: “Whovi” – Female, captured
3rd June 2003**

This radio-collared leopard has definitely been one of our failures. From the time of capture in June 2003 until the time that we think the batteries in her collar no longer worked in June/July 2005 she had only been located on 10 occasions.

We believe she moved in an area with thousands of very large boulders, lots of vegetation and long grass in the valleys. It is of interest to note that not even the Parks and Wildlife staff, who continually patrolled the area, had ever seen her.

**No 4: “Chintampa”– Female, captured
29th January 2003**

The batteries in the radio-collar of this female expired in April 2005. She was last tracked in April 2005 and yet in May only a few days later she could not be found anywhere. In April 2005 we detected that the radio-signal from her collar was very faint and could hardly be heard. This female was fitted with a very bright orange collar and the Parks staff working at the entrance gate to the Game Park often reported seeing a leopard with an orange collar in the area.

On one occasion she was seen on an Impala carcass (15th June 2003) and in March 2005 she was seen stalking some Klipspringer close to the Main Kezi tar road. This female often left the Game Park and there was good evidence that she used a Warthog hole under the game fence to get in and out of the fenced Game Park.

**No 5: “Pomongwe”- Adult male, captured
25th September 2003**

“Pomongwe” has been an absolute delight to track. Even though his home range was much larger than the females and covered the home ranges of three females he was always easy to find and his movement predictable. In his home range three females occurred, these were “Nswatugi” and “Inungu” and that of another female that we were unable to capture. The third adult female was seen on several occasions in the area lying between the home ranges of “Nswatugi” and “Inungu” – but a lot of her time was spent outside the Park on a farm in the north.

Over a period of 23 months “Pomongwe” was located on 218 occasions most of the time by two

lady Volunteers working on the Leopard Project and by NUST students.

“Pomongwe” was the only radio-collared leopard that was caught twice. The second time we caught him he was over 4km from where he was radio-collared.

On his second capture he was still found to be in superb condition and the face wounds that he sustained from the trap when first caught had completely healed. In fact there was no sign of the wounds at all.

“Pomongwe” was found to be much more active than the females and moved greater distances over a short period of time and was very vocal.

**No 6 : “Portia”- Female, captured
17th January 2005**

This female occupied a home range north of “Nswatugi”. She was captured on 17th January 2005 and by the end of December 2006 her radio-collar still transmitted a signal. In December 2006 she was recorded every day over a period of 10 days while the CRI staff were working in the area. On each of the 10 days she was found in a very small area. We noticed time and time again that she did not appear to move a great deal and her total home range was found to be less than 9km². Over the period of two years she had been recorded on no less than 240 occasions. Even from a distance of 3km we were able to pick up her radio-signal and we always knew exactly where she was.

On numerous occasions our trackers “walked in” to the exact spot where she was hiding and they were lucky enough to see her on six occasions.

**No 7: “Whawha”- Adult male, captured
14th February 2005**

This is the second adult male that we were lucky enough to capture in the Matobo National Park. Leopards have been notoriously difficult to capture in the Hills and even though we always set five traps at a time we had problems getting the leopards to enter the trap cages. Very often tracks of a leopard could be seen within a metre of the door of the trap but they would not go into it.

The home range of “Whawha” covered part of the home range of “Nswatugi” and all of “Portia’s”

and also part of “Chitampa’s”. “Pomongwe’s” home range covered the eastern section of “Nswatugi’s” home range while “Whawha’s” home range covered the western part of “Nswatugi’s”.

“Whawha’s” home range extended as far west as the main Kezi tar road and into the area occupied by “Chitampa”. However his range did not appear to cross the main road and at no time was he ever recorded in the Game Park.

PROJECT NO 3: CAPTURE AND TRANSLOCATION OF PROBLEM CHEETAHS, LEOPARDS AND BROWN HYAENAS FOUND KILLING DOMESTIC LIVESTOCK AND THE MONITORING OF THEIR MOVEMENTS AFTER RELEASE BACK INTO THE WILD

1. Cheetah – Matobo National Park.

The two cheetah released into the Matobo National Park in March 2002 at the time of writing this report still occur in the area. One of the animals was fitted with a radio-collar. Their movements were monitored for over two years until the batteries in the collar expired in May 2004.

As mentioned in previous reports these animals moved in and out of the fenced Game Park and now some five years later they are still seen from time to time. In 2005 a female with three cubs was seen in the Game Park but this was not one of the cheetah we released. National Parks staff recorded cheetah feeding on Impala (three times), Warthog (twice), baby Wildebeest (once) and on a baby Zebra (once).

It is indeed pleasing to note that the two cheetah which we released, and which were held in captivity at Chipangali for several years, were able to adjust to the wild once released back into the wild and even survived for five years. The two animals have also been seen on the surrounding private farms north of the Matobo National Park on numerous occasions.

This release could certainly be regarded as a success.

Cheetah – Hwange National Park.

The group of four cheetah released into the Hwange National Park on 31st October 2003 did

very well for over two years. Then disaster struck when they moved out of the National Park. As reported previously one cheetah with a radio-collar injured its leg so badly that it had to be destroyed, a second was killed by local villagers, the third, also with a radio-collar moved into the Shumba area of the Park and the fourth disappeared altogether.

The one that moved into the Shumba area joined up with two wild cheetah (believed to be adult males) and the three have been seen very often in the Robins and Sinamatella part of the Park.

According to “observation forms” filled in by visitors to the Park three cheetah (one with a collar) have been seen on 15 occasions during 2006. This is good news and at least one of the four released in 2003 has survived.

The second group of cheetah released into the Park have done exceptionally well and can still be seen occasionally in the Kennedy Vlei. They were recorded on no less than 12 occasions during 2006 and always along the extreme open grasslands of the Kennedy Vlei.

A third group of cheetah was released into the Park on 31st October 2005. One was fitted with a radio-collar. This pair has remained in the Main Camp area for over two years and their movements monitored regularly. They are very often seen by National Parks staff, other researchers and visitors to the area. In fact they have become quite tame and have been photographed by visitors on numerous occasions. The batteries in the radio-collar on the one animal have now expired, but the animal can still be seen.

2. Leopard – Hwange National Park.

The leopard released at Tshebe Tshebe Pan on 21st March 2003 was fitted with a radio-collar. While the batteries in the collar have expired the colour of the collar on the animal is still very noticeable. It is a bright yellow. Visitors sitting at the Game Viewing Platform at Nyamandhlovu Pan often reported a collared leopard late in the afternoon when it came down to the water to drink.

3. Brown Hyaena – Hwange National Park

On 31st October, 2004 we released a Brown hyaena into the Hwange National Park. It has remained in the Giraffe Springs/Shumba/Nehimba

area for over two years and we have picked up its radio-signal on many occasions. On one occasion it was seen with two wild Brown hyaena in the Nehimba area and recently (September 2006) it was seen by staff drinking at the Shumba Pan. The National Parks staff looking after the Shumba Camp Picnic site indicated that the same hyaena with a collar often came down to the Pan to drink in the early evening. The animal still appears to be doing well two years after being released.

PROJECT NO 4 : THE HOME RANGE AND MOVEMENTS OF A RADIO-COLLARED BROWN HYAENA (*Hyaena brunnea*) IN THE MATOBO NATIONAL PARK

We are delighted to report that this radio-collared animal is still doing fine and has been seen on several occasions not only in the Park but also in the surrounding hills as well. We are also pleased to note that the “Camera Traps” supplied by the Oregon Zoo Foundation are working very well and we have photographed another Brown hyaena (without a collar) on no less than 14 occasions in the Nswatugi area of the Park.

From tracks on the roads, droppings and other signs it is obvious that there are more Brown hyaena in the Park than we ever imagined.

It is hard to believe that such a large species could go undetected for such a long time. The population of Brown hyaena in the Matobo Hills National Park is really great news.

PROJECT NO 5 : CHECK-LIST & ATLAS OF THE CARNIVORES OF MATABELELAND

The special form designed for “visual observations” of Carnivores seen in the wild is proving to be a great success. During 2006 we had 67 completed forms returned to our CRI offices in Bulawayo. The following species have so far been recorded covering a period of two full years:

Servals (11 records); Caracal (4 records); Cape Wild cat (16 records); Honey badger (4 records); Striped polecat (12 records); Banded mongoose (15 records); Bat-eared fox (5 records). There is also one record of a Striped weasel. Records of

Lions, Leopards, Cheetah, Wilddog, Brown hyaena and Spotted hyaena are not included above. A separate distribution map of all species is being updated continually.

PROJECT NO 6 : FIELD SURVEY & CAPTIVE BREEDING PROGRAMME OF THE SOUTHERN AFRICAN PYTHON

Details of what this proposal is all about is included in my 2005 Annual Report so there is no point in repeating all this again.

2006 has been a tremendous year and an additional 25 pythons were received for the project during the year. As space was becoming a problem at our facilities in Bulawayo, some pythons were sent to Chipangali Wildlife Orphanage, a few retained at our Breeding Centre in Bulawayo and a number marked and then released into the Matobo National Park.

At the end of 2006 two of our very large female pythons laid eggs. One female produced 18 eggs and the other 21. Unfortunately, there were just too many pythons in the breeding area and this caused two or more snakes to coil around the same eggs. As a result the eggs did not hatch.

We will definitely have to use a different technique during the 2007 breeding season. Not one of the 20 baby pythons received from National Parks in January 2005 have died and all are growing at a tremendous rate. All 20 were kept in small vivariums for the first year (2005) and then in January 2006 moved into a very large area where they have lots of water and space to move. All of the babies have more than doubled in size and the females are now at the time of writing over 1.5 metres in length. The males are a lot smaller. The clutch of 20 babies consisted of 12 females and eight males. A full and more detailed report on this project will be produced during 2007.

PROJECT NO 7 : BIODIVERSITY SURVEY OF THE MATOBO HILLS WORLD HERITAGE SITE

Work on this project continues and a considerable amount of data on all groups of animals has already been collected.

A publication on the Reptiles and Amphibians of the Hills was completed in 2006 and now “in press”. See Appendix “A” for details. A report on the Scorpions of the Hills has also been written (see Appendix “B”). A detailed study of the Scorpions of the Matobo Hills is being undertaken

A survey of the Fishes of the Hills is continuing and will be completed by mid 2007.

The Small Mammal survey is nearly complete.

The big job now is to write up the results of all the collection of data and specimens over the last 3 – 4 years. This involves many hundreds of hours of “desk work”.

CHILDREN'S WILDLIFE AND ENVIRONMENTAL EDUCATION PROGRAMME

(May to November 2006)

**Compiled By
Joice Ndlovu
Ecologist/ Wildlife Education Officer**

Summary

The Children's wildlife and environmental education programme has made considerable progress during 2006. The Interpretative center located at the Carnivore Research Institute Offices in Bulawayo has been designed and materials for the displays have already been prepared. The displays consist of live snakes, mammal skulls etc. The display focuses on wildlife in general but pays special attention to snakes and carnivores since these are the groups of animals that are often persecuted. Carnivores (leopard and cheetah) form a major part of the comprehensive displays.

Production of educational material mainly for carnivores is on course and so far three booklets have been completed. The materials being produced targets children between the ages of ten and sixteen years old although other people who require basic knowledge of wildlife are also catered for. Educational materials being produced give a basic understanding of carnivores and their surroundings. The educational booklets form part of the CRI Wildlife Series that we are hoping will expand into a series of booklets covering all aspects of wildlife.

The schools outreach programme started off successfully with 6 schools having been incorporated into the education programme. Five of the schools are in Bulawayo while the sixth school is in the Matopos Rural. Lectures have been delivered to all participating schools several times and the children have shown a keen interest in the programme.

The indigenous tree species nursery is on course. All material including seeds required for implementing the nursery have been sourced.

Amongst other things indigenous birds have been collected for the "walk in" aviary and we are also collecting small carnivores that we can hand rear at the already built enclosures at the CRI facilities.

PROGRESS OF PROJECTS

A. Interpretative center

The interpretative center is located at the CRI offices in Bulawayo. The building has already been painted and some of the displays already been set up. All materials for display in the center have been prepared and the design and layout of the display already completed. Materials include posters, and live displays of snakes. The live snake display has been set up. Snakes on display include the pythons, Anacondas,

brown house snakes, puff adders and several other species. Other materials in the display include animal skulls, foetuses preserved in alcohol, posters and other material.

The snake displays constitutes posters and live snakes with the bulk of the snakes being young pythons. However there is also a large collection of fully-grown pythons within the CRI premises that children can see and appreciate. The snake display was necessitated by the hostility of local people to snakes. A change in attitudes of children will go a long way in educating the local people on the importance of snakes and thus reduce their persecution. Other items that were prepared for the display include posters and charts.

We desperately require funds to purchase a projector for the centre.

B. Educational Material.

Literature

Educational material being produced targets children who are between the ages of 10 and 16 years. The initial literature being produced is carnivore material although production of other material will be done after all carnivore profiles have been completed. These are in the form of carnivore profiles and some of the profiles are produced as booklets. These are done to show the differences between animals that are similar to each other and they highlight the differences between the animals. At least five booklets are being worked on with three having been completed. The following are the booklets we are working on.

1. Leopard and cheetah;*
2. Brown hyena and spotted hyena;*
3. Black backed jackal and side-striped jackal.*
4. Serval and caracal;
5. Small spotted genet and rusty spotted genet;

* represents a completed booklet

Of the five booklets three have been completed. In future we hope to have a Children's Wildlife library that will equip children with more information on wildlife.

Lectures

Lectures were designed in such a way that they encourage conservation and also give a basic introduction to carnivores, snakes, birds, amphibians, vegetation, etc. The lectures also encouraged habitat restoration as a way of conserving carnivores. Unfortunately without a projector we were not able to show "digital" or colour slides for the children.

C. Outreach to schools

A lot of activities have been put in place to start and sustain the educational program. The first stage was the identification of schools that would be the first to take part in the program. We identified Montrose High School at which we formed a wildlife club known as the Friends of the Spotted Cats (FOSC). This club comprises of eleven girls who are ordinary level and advanced level biology students who also show a keen interest in wildlife. They meet every Friday afternoon to learn about wildlife and we visit the school to give lectures every fortnight.

A lot of activities are lined up for this group of girls that include trips to the Natural History Museum, Camping trips to the Matopos, quiz competitions, and other activities.

We also have four primary schools, which are Nketa Primary School, Mafela Primary School, Greenfield Primary School, and Barham Green Primary School. In these primary schools we have given several lectures on wildlife and we have managed to raise a keen interest in wildlife in both children and teachers. Lecture topics included snakes, carnivores and other wildlife topics.

To encourage children to read more on wildlife we have lined up a quiz show where the four primary schools participating will take part. To try and reach out to those children away from Bulawayo i.e. in the rural areas we have a poetry competition on wildlife where children in the rural communities will also have the chance to participate in the programme.

Among other activities lined up for the education programme in 2007 is the wildlife magazine that will be a bimonthly issue where children are going to contribute articles for the magazine. In each article we will include at least one species encounter and some animal games.

With all these activities lined up we are looking forward to expanding these programmes to more primary schools and some secondary schools by training the FOSC club to reach out to other students. **However for now we are unable to move around with these students because we do not have a suitable vehicle to ferry children around. An 18-seater vehicle (small bus) will be sufficient to ferry these very promising wildlife lovers.**

In addition to the above schools we also have two students from the National University of Science and technology who are being taught field techniques and other aspects of wildlife and are assisting with the Conservation Education Programme.

D. Aviary

Birds are continuously being added to the aviary at the CRI offices. Different indigenous species now occur in the aviary and the aviary is used for children to identify different species of birds.

(September to November 2006)

I joined the CRI as an attachment student on 1st September 2006. This is a run down of the things I did in the month of September. Sorting out maps, preparing reference catalogue for mammal reprints, and assisted the ecologists with the project on leopard ecology in the Matopos National Park from the 11th to the 20th. During this time I learnt animal tracking, trapping leopards, setting camera traps, collection of scorpions and spiders, use of the GPS and spoor photography. I came up with ideas to do some projects on Baboons and flat-topped acacias as well as something on bird biodiversity as well as fish.

From the 1st to the 13th of October we worked on mammal reprints sorting out a reference catalogue and received a report on a “leopard” which was being spotted at NUST and we started tracking and setting traps for them. We worked in on the educational program where we visited Montrose Girls High School and pioneered the program on the 12th of October. We set out for a field trip in the Matopos from the 16th to the 25th of October. The activities were pretty much the same as for September only I started looking more into the other ideas for projects. For the biodiversity project I marked some plots for the project in three study areas. I tried to work out way in which the fish project would be carried out in the Maleme dam. The plan was to set nets overnight in different areas of the dam, which would be drawn in the mornings and take information on

- 1) The different species of fish caught in the area.
- 2) The numbers of those different fish
- 3) The ecology of the different areas i.e. types of water flora and fauna found in each area.

Since the plan had not been tried out before, I devised a preliminary survey to find out what sought of data we could collect and how useful it could be in the study. In this study I used a fishing hook to catch fish and would record what type they were and the numbers as shown in results **Appendix 1**.

Early November most of my work was on the fish project and I wrote out a provisional project proposal, which I submitted to Mr. Wilson on the 6th of November. Meanwhile the hunt for a Leopard at NUST continued and two young Serval cats were caught making it possible that there is mistaken identity where Serval cats are being identified as Leopards. The educational program was going on well as we managed to hold three lectures in different schools and I attended two of them at Mafela and Nketa Primary schools. The lectures had a striking impact on teachers and school children alike as it raised a keen interest in Wildlife. With more lectures on different forms of wildlife we will be able to get them to take part and spread the knowledge. We finished the catalogue for the mammal reprints on the 11th of November and went to prepare for the field trip in the Matopos.

More work was done in the Matopos this time with the leopard project, fish project and bird and tree biodiversity project. I continued with the sampling using a hook and got the results written in **Appendix 2**, and we collected some specimen for identification at the museum.

For the tree and bird diversity project, initially I had gone as far as marking 25 sampling areas of 20 by 35m each in the 3 sampling plots which I named Pomongwe, Maleme and Inungu. This time I chose 5 Sampling areas at random from each of the 3 plots giving a total of 15 sampling areas. In the selection process, I cut up 25 cards and wrote the numbers 1 up to 25, put them in a bag and asked Joice to pick 15 cards at random with replacement. Then I came up with 5 sampling areas for each plot as in **Appendix 3**

After taking a rough look at the results on tree diversity, it shows that the chosen plots are comparable and the data can be studied. Generally the order of species richness, abundance and diversity gives Pomongwe. Maleme then Inungu with Pomongwe being the richest. That is from mere speculation, no statistical analyses have been carried out as yet.

Other activities include tree and bird identification and the birds identified were recorded. All in all we identified 34 tree species and 21 bird species. At this point I can suggest a way forward in this project by giving a new title;

Influence of habitat heterogeneity on Bird diversity in three selected habitats in Matopos World Heritage Site. Results of the survey are included in Appendix 4 and 5.

On the Leopard Ecology project

There were more hitches this time because of the rain in December scat decomposition happened so fast that we didn't collect many scats as there were thousands of demestes beetles that kept breeding. The rains closed up spoors and therefore Leopard movement was not easy to detect. On Friday the 17th we set up leopard traps using Impala bait. It was an even longer process for the leopards to get close to the traps, as the meat took long to start putrefying so in our short stay we did not catch any leopards.

APPENDICES

Appendix 1

Results on numbers and types of fish caught on three different areas and times.

Date	Sp1 Black bream	Sp2 Rainbow Bream	Sp3 Catfish	Sp4 White Bream	Sp5 Silver fish	Total
20-10-06	4	7	2	0	2	15
22-10-06	14	54	0	3	26	97
24-10-06	1	4	2	0	2	9
Totals	19	65	4	3	30	126

Appendix 2

Results on fish survey in the Maleme

Date	Rainbow Bass	Black bream <i>T. mossambicas</i>	Catfish Barbel	White Bream	Silver fish <i>Barbus Mattozzi</i>
14 – 11 – 06	45	3	8	0	0
15 – 11 - 06	49	16	3	0	28
20 – 11 - 06	12	0	1	0	2

Appendix 3

Table of sampling areas in plots

Plot 1	Plot 2	Plot 3
10	4	14
17	13	15
2	24	22
25	20	7
9	15	3

Results on tree diversity

Plot 1- Pomongwe

AREA	TREE SPECIES		NUMBER
	LATIN NAME	COMMON NAME	
2	1) <i>Heteropyxis natalensis</i>	Lavender tree	88
	2) <i>Friesodielsia obovata</i>	Umdlandlovu Small leaved Jackal berry	16 2
	3) <i>Diospyros natalensis</i>		16
	4) <i>Spp X- to be identified</i>	Mtshekisane	14
	5) <i>Euclea undulata</i>	Mnondo	5
	6) <i>Julbernardia globiflora</i>	African Wattle/Weeping	2
	7) <i>Peltophorum africanum</i>	Wattle False Wild Medlar	8
	8)		4
	9) <i>Dovyalis caffra</i>	Marula	1
	10) <i>Sclerocarya birrea</i>	Silver cluster leaf	1
	11) <i>Terminalia sericea</i>		1
	12) <i>Dombeya rotundifolia</i>	Kudu berry	6
	9	1) <i>Terminalia sericea</i>	Silver cluster leaf
2) <i>Heteropyxis natalensis</i>		Lavender tree	5
3) <i>Dicrostachys cinerea</i>			2
4) <i>Friesodielsia obovata</i>		Umdlandlovu	8
5) <i>Diospyros natalensis</i>			4
6) <i>Terminalia prunioides</i>		Mangwe	26
7) <i>Spp x</i>			5
8) <i>Dombeya rotundifolia</i>		False Wild Medlar	1
9)		Umbhunzu	1
10) <i>Grewia monticolor</i>		Willow Rhus	1
11) <i>Rhus lancea</i>		Mtshekisane	2
12) <i>Euclae undulata</i>		Round-leaved	18
13) <i>Boscia angustifolia</i>		Shepherd's tree	
		Muchecheni	1
		Wild Olive	1
14) <i>Ziziphus mucronata</i>		Rough-leaved	12
15) <i>Olea europaea</i>		commiphora	2
16) <i>Commiphora edulis</i>			1
17) <i>Rhus elosa</i>			3
18) <i>Maytenus molle</i>	Natal Guarri		
19) <i>Euclea Natalensis</i>			

10	1) <i>Heteropyxis natalensis</i> 2) <i>Friesodielsia obovata</i> 3) <i>Diospyros natalensis</i> 4) <i>Euclea undulata</i> 5) <i>Julbernardia globiflora</i> 6) <i>Sclerocarya birrea</i> 7) <i>Terminalia sericea</i> 8) <i>Dombeya rotundifolia</i> 9) <i>Rhus elosa</i> 10) 11) <i>Terminalia mollis</i> 12) <i>Ziziphus mucronata</i> 13) <i>Dicrostachys cinerae</i> 14) <i>Grewia monticola</i> 15) <i>Maytenus molle</i> 16) <i>Olea europea</i> 17) <i>Bolusanthus speciosus</i>	Lavender tree Umdlandlovu Small leaved Jackal berry Mtshekisane Mnondo Marula Silver Cluster leaf Wild pear Ucane Soap nettle Mangwe Muchecheni Umbhunzu Wild Olive Tree Wisteria	4 27 10 0 1 2 2 1 4 1 12 9 2 1 1 1 1 1
17	1) <i>Ziziphus mucronata</i> 2) <i>Friesodielsia obovata</i> 3) <i>Terminalia mollis</i> 4) <i>Terminalia prunioides</i> 5) <i>Diospyros natalensis</i>	Muchecheni Umdlandlovu Mangwe Mangwe Small leaved Jackal berry	1 4 4 1 1

Results for plot 25 were difficult to extract so I left out the plot and will find a way of sampling it next time.

Plot 3- Inungu

AREA	TREE SPECIES		NUMBER
3	1) <i>Ziziphus mucronata</i> 2) <i>Acacia karroo</i> 3) <i>Friesodielsia obovata</i> 4) <i>Spp X₁</i>	Muchecheni Umdlandlovu	6 10 1 3
7	1) <i>Friesodielsia obovata</i> 2) <i>Acacia karroo</i> 3) <i>Terminalia mollis</i> 4) <i>Spp X₁</i> 5) <i>Diospyros natalensis</i> 6) 7) <i>Dombeya rotundifolia</i> 8) <i>Ziziphus mucronata</i> 9) <i>Papea capensis</i> 10) <i>Sclerocarya birrea</i> 11)	Umdlandlovu Mangwe Small leaved Jackal berry Kudu berry Muchecheni Isagogwane Marula Umklampunzi	32 4 1 3 12 2 2 4 2 2 1
14	1) <i>Friesodielsia obovata</i> 2) <i>Spp X₁</i> 3) <i>Rhus elosa</i> 4) <i>Acacia karroo</i> 5) <i>Ziziphus mucronata</i> 6) <i>Papea capensis</i> 7) <i>Terminalia mollis</i> 8) <i>Terminalia sericea</i> 9) <i>Azanza garckeana</i> 10) <i>Diospyros Natalensis</i> 11)	Umdlandlovu Ucane Muchecheni Isagogwane Mangwe Silver cluster leaf Uxakuxaku Small leaved Jackal berry Umklampunzi	15 2 0 48 6 4 1 1 1 1 4
15	1) <i>Friesodielsia obovata</i> 2) <i>Ziziphus mucronata</i> 3) <i>Peltophorum africanum</i> 4) <i>Acacia karroo</i> 5) <i>SppX₁</i> 6) <i>Combretum hereroense</i> 7) <i>Diospyros natalensis</i> 8) <i>Papea capensis</i> 9) <i>Rhus elosa</i> 10) <i>Vepris zambesiaca</i>	Umdlandlovu Muchecheni African Wattle Small leaved Jackal berry Isagogwane Ucane Rare woodland vepris	14 2 1 17 2 2 18 7 1 1

22	1) <i>Terminalia sericea</i>	Silver Cluster leaf	5
	2) <i>Acacia karroo</i>		26
	3) <i>Friesodielsia obovata</i>	Umdlandlovu Muchecheni	30 3
	4) <i>Ziziphus mucronata</i>	Umklampunzi	2
	5)	Rare woodland vepris	5
	6) <i>Vepris zambesiaca</i>	Small leaved Jackal berry	9
	7) <i>Diospyros natalensis</i>	Ucane	1
	8) <i>Rhus elosa</i>		

Appendix 5

Lists of the birds seen in the three transects

Pomongwe transect

DATE	BIRD SPECIES	NUMBER
14-11-06	Black eyed Bulbul	2
	Emerald spotted dove	1
	Black shouldered kite	1
17-11-06	Black eyed bulbul	2
19-11-06	Red chested cuckoo	1

Inungu transect

Date	Bird Species	Number
19-11-06	Yellow billed hornbill	1
	Yellow eyed canary	1
	Laughing dove	3

Maleme Dam Transect

Date	Bird Species	Number
18-11-06	Grey Lorie	2
	Red winged starling	1
	African fish eagle	1
	Lesser Jacana	4
	Black-eyed-bulbul	6
	Pin-tailed whydah	1
	Palm swift	5
	Egyptian goose	2
	Kurricane thrush	1
	Willow warbler	6
19-11-06	Pied Kingfisher	3
	Pygmy Kingfisher	1
	Black Eagle	2
	African Fish Eagle	2
	Masked weaver	4
	Black-eyed Bulbul	4
	Cape turtle dove	1
	Plum colored Starling	2
20-11-06	Yellow-billed francolin	1
	Black-eyed bulbul	2

Report of NUST attachment student Ashley Mudungwe

(September to November 2006)

When I started my attachment, on the 18th of September, Mr. Wilson V.J. asked me to continue with cataloguing of reprints, reports and journals. The activity was about filing all the articles in a chronological order to facilitate easy retrieval of the articles for use. To achieve this, we would code each article with a letter, M, and a number, but prior to that all articles would have been arranged into groups depending on what subject or species they talk about. For example, articles on cheetah were labeled first, followed by elephants, antelopes and so on.

The information on the catalogue would then be: the code of the article, the author(s), the year of publication, the title of the article and the publication from which it was reprinted from, in that order. An extract from the catalogue illustrates the point:

M319	Morris N.F. Hanks J.	1974	Reproduction in the Bushbuck (<i>Tragelaphus scriptus ornatus</i>) <u>Arnoldia. Vol.7 No. 1</u>
M320	Simpson D.C.	1974	Habitat preference and seasonal Movement in the Chobe Bushbuck (<i>Tragelaphus scriptus ornatus</i>) <u>Arnoldia. Vol.6. No 32.</u>

So using the catalogue one can easily search for any article using either the author or the title of the article and then going straight to its number without having to search through a whole pile of books.

Mr. Wilson V. J. also demonstrated how to use mist nets to catch birds for the “walk in” aviary that will be used for education purposes. We also did some gardening. We planted various species of succulents and desert plants, which include Aloes, Cacti, and Euphorbia. I really enjoyed the exercise and I got to appreciate the beauty that these plants can add to a place.

During the month of October two major activities took place. Firstly after reports of an alleged leopard within the premises of the National University of Science and Technology (NUST), the pro Vice chancellor Prof. Sam Sibanda approached the Carnivore Research Institute for help by surveying the area to verify the existence of any leopard in the campus of NUST. The intention was to capture and translocate the animal if it really did exist within the premises of NUST as it was causing a lot of panic among students and staff. This activity gave me good insight into the practical aspects involved in the tracking and trapping of animals in general and the cats in particular. The details of the study are given below:

The objectives of the survey were to:

- 1) Identify the possible prey species existing in the area and estimate their abundances to see if they could possibly meet the requirements of a leopard.
- 2) To gather evidence that would lead to the positive identification of the carnivorous cat living in the area by collecting scats, analyzing the spoor and trapping the animal to provide a live specimen.

The study area was made up of the woodland that stretches from the Northeastern to the Northwestern sides of the Chemistry Building. It is a typical savanna type of woodland with more or less equal proportions of trees and grasses. It is mainly dominated by Acacia species, followed by various other species notably mopane, Combretum, Terminalia etc. The topography of the area is characterized mainly by flat ground. However due to excavations some portions of the landscape have been turned into very

deep and wide gullies, some of which have become water bodies. There are no significant rock bodies in the area except for one or two small boulders where excavations took place.

STUDY METHOD

- 1) The study area was divided into two transects, the Northeastern and the Northwestern transect, which were divided by the road from the Chemistry Building to the Killarny gate.
- 2) Sampling was done on preexisting belts, which were defined by dust roads about 2.5-3.0m in width. The sampling procedure involved walking along these belts, which were more or less than a kilometer in length; collecting scats of the carnivore and of possible prey species and also taking note of any spoor that we encountered along the way.
- 3) After clearing all the roads of the old scats, we sampled again after a few days for fresh scats and spoor. This was done to give an idea of where to put the traps. We then set our trap in the Northeastern transect.

RESULTS

PREY BASE

The survey showed that there is a very rich and diverse prey base in the study area. Prey species in the area include game birds such as francolins, hares, antelopes such as steenbok and the common grey duiker and various rodent species.

From the high density of hare droppings, antelope spoor and sightings of francolins it is possible that an animal as big as a leopard could find enough food in the area. Hence judging from the prey base alone, the possibility of a leopard in the area cannot be excluded.

SCATS AND SPOORS

A lot of scats were collected from the Northeastern transect and we also encountered few sets of good spoor. From the shape and the size of the scats collected the largest possible carnivore in the area emerged to be the serval cat (*Felis serval*). We also encountered some good sets of serval spoor in the study area. However, we also encountered some large clawed spoor, which raised suspicions of a cheetah but due to the presence of dogs in the area interpretation of the spoor became confounded. We also noted that some of the scats we collected were large enough to be of a cheetah.

TRAPS

Due to the enormous amount of evidence pointing to the presence of servals smaller traps were chosen and placed in the Northeastern transect. Initially only one trap was placed in the field and the first trapping attempt was done using meat as bait. We did not catch anything but the bait was later changed to dead chicks and two servals were caught on different occasions.

Prof. Sam Sibanda and others from the university came to see the servals and took pictures of the animals, which they said would be posted onto the Internet to clarify to the public which animal really existed in the University campus.

Also in the month of October, we took a ten-day trip to the Matopos World Heritage Site for some fieldwork on the Leopard ecology project with Joice, Dorothy and Collin.

The visit to the Matopos gave me good insight into the Leopard ecology project being carried out by Joice Ndlovu, the ecologist and education officer at the CRI. Prior to the fieldwork, she gave an explanation of her project, how she was conducting it and her data analysis. Basically the project is aimed at determining the distribution and abundance of leopards in relation to prey densities. The design of the project involves a study area of about 180km², which is divided into three transects of about 60km² each. The first transect (T1) is the Inungu-Nswatugi transect. The second transect (T2) is the Maleme-Silozwi transect and the third transect (T3) is the Scenic Route transect.

On the second day, it was time for sampling. The sampling areas are belt transects which are defined by clearly demarcated roads of about 3m in width and 14km in length in T1, 8km in length in T2 and 7km in length in T3. The sampling procedure involved taking a slow drive along each belt and picking up leopard scats encountered along the way. Using a Geographical Positioning System (GPS), we would record the exact point where each pile was found called the waypoint and the exact bearing of the place.

From the contents of the scats we could tell what the leopard had been eating and dassie bones were very common in the scats.

Occasionally we would also encounter hedgehog fur in the scats.

The other sampling procedure involved using camera traps, to photograph animals, which pass in front of them. The cameras are placed along the edges of the belt and they will photograph any animals passing in front of them. This technique is of great importance because it will give an idea of the various animal species present in the transect, which can be preyed upon by the leopards in addition to giving pictures of the individual leopards present in the area.

The other sampling technique employed was the observation and photographing of the leopard spoor encountered in the belts.

The technique, although very useful, we realized that it had some pitfalls, especially in the manner in which the photographs were being taken. The photographs were being taken at a different angle and height above the ground every time, which makes any reliable comparison of spoor photographs almost impossible. It was after this realization that Joice suggested that we work on a project that will allow us to standardize the method of photographing the spoor and also develop our own computer programme that can analyze and differentiate the spoor of different leopards by comparing certain variables which we would have input into the programme. The variables to be analyzed include: the longest width of the pad, longest length of the pad, longest distance from the pad to the furthest toe, distance from the end of the pad to the beginning of middle toe, the diameter of all toes, length of the toes and the longest diagonal distance from the pad. If completed the programme will be able to tell whether the same animal or different animals made two photographed spoor.

On day 6, we managed to get bait, a female impala, which had a fetus in its uterus, which was about to be born as it was so well developed. Then adventure began; everything involved in the putting up of the leopard traps seemed out of this world to me because I had never imagined anything like that. We cut up the impala, removed pieces and put them in the traps. All the traps were concealed with branches of trees and the remainder of the carcass was tied onto the back of the truck and pulled along the road to leave the smell around. The trapping method really proved to be effective because after putting the bait we encountered more spoor along the belts than we had before. Some tracks could be seen that the leopard was actually following the track made by the dragging carcass.

One leopard was caught but was lucky enough to escape from a trap.

I also spent time putting up live rodent traps and I managed to catch nine, which I hope will breed. They will be used as food for the pythons under the growth rate experiment.

As a way of contributing to the ongoing Biodiversity Survey of the Matopos World Heritage Site, I decided to undertake a study of the diversity, distribution and abundance of the various plant species in Matopos. The main focus of the project is to find out how the diversity, distribution and abundance of plant species is affected by the numerous and splendid rock formations in the Matopos. Plant specimen will also be collected and identified and kept in the CRI herbarium.

Also in Matopos we prepared a specimen questionnaire on how pythons are being used in traditional medicines. Back in town the final questionnaire was drafted and interviews with the traditional healers began on the first of November.

The study is aimed at exploring the myths, beliefs and superstitions about the python and its uses in traditional medicines. The Institute is also running a python-breeding programme; hence the study provides a good platform for the exchange of information between relevant stakeholders. Information exchange is important because it allows different groups of people to harmonize their views and hence develop a common approach to python product utilization, conservation tools and harvesting of pythons, which leads to sustainable use of the species. The study targeted potential users of python products and holders of information, which are the traditional healers mainly, and some elderly people who are not traditional healers. The traditional healers involved in the study are those affiliated to the Zimbabwe

Traditional Medical Practitioners Association. Only those in Bulawayo could be consulted and questionnaires were used to interview them at their Anchor House offices.

The python in African Tradition.

Our first encounter with Gogo Mashiri, a traditional medical practitioner at Anchor House clearly showed us that to her, the python is not just a python or a snake, but it holds a more significant value than that. We told her the intention of our visit and of the python-breeding project. When she heard that we sometimes handle the pythons, she said

“Kukona elilako, lilamadhlozi lina.” (**You have something on you, you have ancestral spirits**). She maintained that the only way one could handle a python is either when the person has been ‘allowed’ to do so by the ancestral spirits, meaning they will be possessed or in a trance or when a person has got some *muti* that prevents them from being harmed by the snake. She went on to say that either we had some spirits of which whose presence on us we were not aware of, or, the director of the institute had the *muti* to control the snakes, “and if he does”, she said, “he will never tell you.”

When she said this, I was reminded of sometime when I had to ask Mr. Wilson the same question. It was after he had shown us a video of how he captured a very huge python with his own bare hands from a mine site where it had become a problem to the workers there. His courage really amazed me, so I asked him “where do you get the courage to handle such snakes, do you have *muti* or something.” V.J. Wilson said, “No, it is only because I understand them”. To Gogo Mashiri however, it’s a different story, either you are possessed or you got *muti* for you to handle large wild pythons.

We asked Gogo Mashiri if she would handle a python herself. She told us that in her normal state she would never attempt such a thing, but if her ancestral spirits allow her to do so, she definitely would. She explained that the ancestral spirits ‘give’ their medium the python by showing it to them in a vision or a dream in their sleep. She said once shown this vision the medium becomes possessed and in that state they go straight to the place they have been directed to in their vision. She explained that even if the python happens to be underwater, the person in a trance could swim to it and bring it out coiled around him, without being harmed by it, because it would have been ‘given’ to him.

She told us that she once had that kind of a vision herself. To her it came as a dream where she dreamt of the python in a rocky place under a bridge. She said in her sleep, she went to that place and found the python there. It was very big she said, but somehow she hesitated to take it and left it there. When we asked her what they use the python for, she mentioned only a few things. The skin and the bones are worn around the neck, the skin like some special scarf and the bones as a necklace. They are said to invite the ancestral spirits, hence they are part of the regalia they wear during their work. She also said that the oil and fat from a python is used as a remedy for earaches and that she once used it to cure her son’s ear and it worked perfectly. The only problem she said, is that there are no more pythons around hence they could no longer use them in their practice. She said she would be very glad if we assisted her to get some python parts.

From the discussion with Gogo Mashiri it emerged that ancestral spirits have a very strong connection with the African rock python. However the reason why this should be like that still remains a mystery. Gogo Mashiri made arrangements for us to meet a group of seven practitioners the following week and we had an interesting discussion with them.

They brought up a lot of issues concerning the handling of pythons, breeding pythons and the uses of the python in general. They further strengthened the association of the python with ancestral spirits by saying that it is very rare for any person who does not have *muti* or ancestral spirits to meet a python, especially the big ones in the wild. They told us that even after a big meal, when the python remains at the same place for a number of days, people may never get to know of its presence even if it is close to a road or somewhere not so hidden. They said this is because the intuition of the people or some feeling or instinct will just make them avoid using the particular road close to where it is until it goes away. They attribute this feeling or instinct to the fact that the ancestors or spirits will be protecting the python from the ordinary people who do not know its importance and value and hence may kill it.

Appendix “A” THE REPTILES AND AMPHIBIANS OF THE MATOBO HILLS

Class REPTILIA

Order TESTUDINES (Terrapins and Tortoises)

Family PELOMEDUSIDAE (Side-necked Terrapins)

<i>PELOMEDUSA SUBRUF</i> A (Bonaterre)	Helmeted Terrapin
<i>PELUSIOS SINUATUS</i> (A. Smith)	Serrated Hinged Terrapin

Family TESTUDINIDAE (Tortoises)

<i>KINIXYS SPEKII</i> Gray	Speke’s Hinged Tortoise
<i>GEOCHELONE PARDALIS</i> (Bell)	Leopard Tortoise

Order SAURIA (Lizards)

Family AGAMIDAE (Agamas)

<i>ACANTHOCERCUS ATRICOLLIS</i> (A. Smith)	Southern Tree Agama
<i>AGAMA KIRKII</i> Boulenger	Kirk’s Rock Agama
<i>AGAMA ARMATA</i> Peters	Eastern Spiny Agama

Family CHAMAELEONIDAE (Chameleons)

<i>CHAMAELEO DILEPIS</i> Leach	Flap-necked Chameleon
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Family GEKKONIDAE (Geckos)

<i>AFROEDURA TRANSVAALICA</i> (Hewitt)	Transvaal Flat Gecko
<i>CHONDRODACTYLUS TURNERI</i> (Gray)	Turner’s Giant Gecko
<i>PACHYDACTYLUS TIGRINUS</i> Van Dam	Tiger Thick-toed Gecko
<i>PACHYDACTYLUS PUNCTATUS</i> Peters	Speckled Thick-toed Gecko
<i>HOMOPHOLIS WAHLBERGII</i> (A. Smith)	Wahlberg’s Velvet Gecko
<i>LYGODACTYLUS STEVENSONI</i> Hewitt	Stevenson’s Dwarf Gecko
<i>LYGODACTYLUS CAPENSIS</i> (A. Smith)	Cape Dwarf Gecko
<i>LYGODACTYLUS CHOBIENSIS</i> FitzSimons	Chobe Dwarf Gecko
<i>HEMIDACTYLUS MABOUIA</i> (Jonnes)	Tropical House Gecko
<i>HEMIDACTYLUS TASMANI</i> Hewitt	Tasman’s Rock Gecko

Family SCINCIDAE (Skinks)

<i>TRACHYLEPIS MARGARITIFER</i> (Peters)	Rainbow Rock Skink
<i>TRACHYLEPIS VARIA</i> (Peters)	Variable Skink

<i>TRACHYLEPIS WAHLBERGII</i> (Peters)	Wahlberg's Striped Skink
<i>LYGOSOMA SUNDEVALLII</i> (A. Smith)	Sundevall's Writhing Skink
<i>PANASPIS MACULICOLLIS</i> Jacobsen & Broadley	Spotted-neck Snake-eyed Skink
<i>TYPHLACONTIAS ROHANI</i> Angel	Kalahari Burrowing Skink
<i>ACONTIAS OCCIDENTALIS</i> FitzSimons	Western Legless Skink
Family LACERTIDAE (Typical Lizards)	
<i>NUCRAS HOLUBI</i> (Steindachner)	Holub's Sandveld Lizard
<i>NUCRAS INTERTEXTA</i> (A. Smith)	Spotted Sandveld Lizard
<i>ICHNOTROPIS SQUAMULOSA</i> Peters	Common Rough-scaled Sand Lizard
<i>ICHNOTROPIS CAPENSIS</i> (A. Smith)	Cape Rough-scaled Sand lizard
<i>HELIOBOLUS LUGUBRIS</i> (A. Smith)	Bushveld Lizard
Family CORDYLIDAE (Girdled and Flat Lizards)	
<i>CORDYLUS JONESII</i> (Boulenger)	Jones' Girdled Lizard
<i>PLATYSAURUS RHODESIANUS</i> FitzSimons	Zimbabwe Flat Lizard
Family GERRHOSAURIDAE (Plated Lizards)	
<i>GERRHOSAURUS VALIDUS</i> A. Smith	Giant Plated Lizard
<i>GERRHOSAURUS NIGROLINEATUS</i> Hallowell	Black-lined Plated Lizard
<i>GERRHOSAURUS FLAVIGULARIS</i> Weigmann	Yellow-throated Plated Lizard
Family VARANIDAE (Monitor Lizards or Leguans)	
<i>VARANUS ALBIGULARIS</i> (Daudin)	Savanna Monitor or Leguuan
<i>VARANUS NILOTICUS</i> (Linnaeus)	Nile Monitor or Water Leguuan
Suborder SERPENTES (Snakes)	
Family TYPHLOPIDAE (Blind Snakes)	
<i>RHINOTYPHLOPS LALANDEI</i> (Schlegel)	Delalande's Blind Snake
<i>RHINOTYPHLOPS MUCRUSO</i> (Peters)	Zambezi Blind Snake
Family LEPTOTYPHLOPIDAE (Worm Snakes)	
<i>LEPTOTYPHLOPS LONGICAUDUS</i> Peters	Long-tailed Worm Snake
<i>LEPTOTYPHLOPS SCUTIFRONS</i> Peters	Peter's Black Worm Snake
Family PYTHONIDAE (Pythons)	
<i>PYTHON NATALENSIS</i> A. Smith	Southern African Python

Family VIPERIDAE (Adders and Vipers)

<i>CAUSUS RHOMBEATUS</i> (Lichtenstein)	Rhombic Night Adder
<i>CAUSUS DEFILIPPII</i> (Jan)	Snouted Night Adder
<i>BITIS ARIETANS</i> (Merrem)	Puff Adder
<i>BITIS (CALECHIDNA) CAUDALIS</i> (A. Smith)	Horned Adder

Family ATRACTASPIDIDAE (African Burrowing snakes)

<i>ATRACTASPIS BIBRONII</i> A. Smith	Bibron's Stiletto Snake
<i>AMBLYODIPSAS POLYLEPIS</i> (Bocage)	Purple-glossed Snake
<i>AMBLYODIPSAS VENTRIMACULATA</i> (Roux)	Kalahari Purple-glossed Snake
<i>APARALLACTUS LUNULATUS</i> (Peters)	Reticulated Centipede-eater
<i>APARALLACTUS CAPENSIS</i> A. Smith	Cape Centipede-eater

Family ELAPIDAE (Cobras and allies)

<i>ELAPSOIDEA BOULENGERI</i> Boettger	Zambezi Garter Snake
<i>ASPIDELAPS SCUTATUS</i> (A. Smith)	Western Shield Snake
<i>NAJA ANNULIFERA</i> Peters	Snouted Cobra
<i>NAJA MOSSAMBICA</i> Peters	Mozambique Spitting Cobra
<i>DENDROASPIS POLYLEPIS</i> Gunther	Black Mamba

Family LAMPROPHIIDAE (African Nocturnal Snakes)

<i>LAMPROPHIS CAPENSIS</i> (Dumèril & Bibron)	Brown House Snake
<i>MEHELYA CAPENSIS</i> (A. Smith)	Southern File Snake
<i>LYCOPHIDION CAPENSE</i> (A. Smith)	Cape Wolf Snake

Family PSEUDASPIDIDAE (Mole Snake)

<i>PSEUDASPIS CANA</i> (Linnaeus)	Mole Snake
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Family PSAMMOPHIIDAE (Sand, Whip, Grass and Beaked Snakes)

<i>PSAMMOPHLYAX TRITAENIATUS</i> Günther	Three-lined Grass Snake
<i>PSAMMOPHIS SUBTAENIATUS</i> Peters	Western Stripe-bellied Sand Snake
<i>PSAMMOPHIS PHILLIPSII</i> (Hallowell)	Olive Whip Snake
<i>PSAMMOPHIS JALLAE</i> Peracca	Jalla's Sand Snake
<i>PSAMMOPHIS ANGOLENSIS</i> (Bocage)	Dwarf Sand Snake

INCERTAE SEDIS

PROSYMNA BIVITTATA Werner

Two-striped Shovel-snout

PROSYMNA LINEATA (Peters)

Lined Shovel-Snout

PROSYMNA STUHLMANNII (Pfeffer)

Eastern Shovel-Snout

Family NATRICIDAE

NATRICITERES OLIVACEA (Peters)

Olive Marsh Snake

Family COLUBRIDAE

PHILOTHAMNUS HOPLOGASTER (Günther)

Southeastern Green Snake

PHILOTHAMNUS SEMIVARIEGATUS (A. Smith)

Variiegated Bush Snake

CROTAPHOPELTIS HOTAMBOEIA (Laurenti)

Herald Snake

TELESCOPUS SEMIANNULATUS (A. Smith)

Southeastern Tiger Snake

DISPHOLIDUS TYPUS (A. Smith)

Boomslang

THELOTORNIS CAPENSIS A. Smith

Savanna Vine Snake

DASYPELTIS SCABRA (Linnaeus)

Common Egg-eater

Family CROCODYLIDAE (Crocodiles)

CROCODYLUS NILOTICUS (Laurenti)

Nile Crocodile

Class AMPHIBIA (Amphibians)

Order ANURA (Frogs and Toads)

Family PIPIDAE (Clawed Frogs)

XENOPUS LAEVIS (Daudin)

Common Clawed Frog or Platanna

Family BUFONIDAE (Toads)

BUFO GUTTURALIS Power

Guttural Toad

BUFO MACULATUS Hallowell

Flat-backed Toad

BUFO GARMANI Meek

Olive Toad

BUFO FENOULHETI Hewitt & Methuen

Fenoulhet's Pigmy Toad

SCHISMADERMA CARENS (A. Smith)

Red-backed Toad

Family MICROHYLIDAE (Burrowing Frogs)

BREVICEPS ADSPERSUS Peters

Bushveld Rain Frog

PHRYNOMANTIS BIFASCIATUS (A. Smith)

Red-banded Rubber Frog

Family HEMISOTIDAE (Snout-burrowing Frogs)

HEMISUS MARMORATUS (Peters)

Marbled Snout-burrowing Frog

HEMISUS GUINEENSIS Cope

Greater Snout-burrowing Frog

Family RANIDAE (Typical Frogs)

PYXICEPHALUS ADSPERSUS Tschudi

Giant African Bullfrog

TOMOPTERNA CRYPTOTIS (Boulenger)

Kalahari Pyxie

TOMOPTERNA MARMORATA (Peters)

Marbled Pyxie

TOMOPTERNA TUBERCULOSA (Boulenger)

Beaded Pyxie

AFRANA ANGOLENSIS (Bocage)

Common River Frog

STRONGYLOPUS FASCIATUS (A. Smith)

Striped Grass Frog

PTYCHADENA ANCHIETAE (Bocage)

Plain Ridged Frog

PTYCHADENA POROSISSIMA (Steindachner)

Striped Grass Frog

PTYCHADENA UZUNGWENSIS (Loveridge)

Udzungwe Grass Frog

PHRYNOBATRACHUS NATALENSIS (A. Smith)

Snoring Puddle Frog

PHRYNOBATRACHUS MABABIENSIS FitzSimons

Mababe Dwarf Puddle Frog

CACOSTERNUM BOETTGERI (Boulenger)

Boettger's Dainty Frog

Family RHACOPHORIDAE (Tree Frogs)

CHIROMANTIS XERAMPELINA Peters

Southern Foam-nest Tree Frog

Family HYPEROLIIDAE (Tree Frogs and Reed Frogs)

LEPTOPELIS BOCAGII (Günther)

Bocage's Burrowing Frog

KASSINA SENEGALENSIS (Duméril & Bibron)

Senegal Kassina

HYPEROLIUS NASUTUS (Günther)

Sharp-snouted Reed Frog

HYPEROLIUS TAENIATUS Peters

Striped Reed Frog

Appendix “B” - THE SCORPIONS OF THE MATOBO HILLS WESTERN ZIMBABWE

Introduction

Scorpions belong to the class *Arachnida* and to the order *Scorpiones*. *Arachnida* fall under the subphylum *Chelicerata* of the phylum *Arthropoda*.

Within the Phylum *Arthropoda* there are four other classes in addition to the *Arachnida* namely Crustaceans (*Crustacea*), Millipedes (*Diplopoda*), Centipedes (*Chilopoda*) and Insects (*Insecta*).

The order *Arachnida* include Spiders (*Aranaea*), Pseudoscorpions (*Pseudoscorpionida*), Sunspiders (*Solibugae*), Microwhisperscorpions (*Palpigradi*), Tailless whisperscorpions (*Amblypygi*), Harvestmen (*Opiliones*), Mites and Ticks (*Acarina*) Whisperscorpions (*Uropygi*), Ricinuleids (*Ricinulei*), and Scorpions (*Scorpionida*). The Palpigrades have not yet been found in Zimbabwe.

All Arachnids have eight legs and a body consisting of two sections – the cephalothorax and the abdomen. The Arachnids all have jointed legs and the phylum *Arthropoda* literally means a tribe of animals with jointed legs. All scorpions found in the hills have neurotoxic venom and the venom gland is situated at the end of the tail.

This brief report deals specifically with the Scorpions of the Matobo Hills and covers all the species found throughout the hills including the Matobo National Park and the Matobo Hills World Heritage Site.

There are three families of scorpions in Zimbabwe all of which are present in the Matobo Hills. These are the burrowing scorpions (*Scorpionidae*), thick-tailed scorpions (*Buthidae*) and the cryptic and rock scorpions (*Liochelidae*) The *Liochelidae* are also known as the thin-tailed scorpions.

The following species are known to occur in the Matobo Hills and all species have been studied and collected over a period of five years (2002 – 2006 inclusive) as part of our Biodiversity Survey of the Matobo Hills.

Family *LIOCHELIDAE* (Thin-tailed Scorpions)

Genus *Hadodenes*

Species *Hadogenes troglodytes*

Granite Rock Scorpion, Rock Scorpion

This scorpion occurs throughout the granite hills of the Matopos. It is a very large species with a total body length of over 180mm. Males are larger than females and one specimen collected at Maleme Dam in December 2005 measured 220mm and weighed 39 grams. This species is one of the largest in the world. Males often have exceptionally long thin tails. The rock scorpion is usually found under loose exfoliated slabs of granite on large open “dwalas”. They are very dark coloured and have flat bodies covered with long sensory hairs. These hairs no doubt assist them in determining the shape and size of the crevices in which they hide. The Matobo Hills is an ideal habitat for lithophilous scorpions. They are nocturnal creatures and feed on a large variety of insects, millipedes, centipedes and even other scorpions.

On one occasion a large female was placed in a collecting jar with a centipede. Both species had been collected within five minutes of each other. As the scorpion was dropped into the jar with the centipede it instantly grabbed the centipede and commenced feeding on it.

The rock scorpion is very easy to identify. They have very large pedipalps (claws), thin tails, small venom vesicle, very flat appearance and elongated appendages (Lenning, 2003).

According to Lenning (2003) *Hadogenes* scorpions can live for as long as 25 to 30 years and males and females take about six to ten years to reach maturity. The gestation period is up to 18 months. A female

collected in the Matopos National Park in January 2002 had a brood of 18 young and with six other females had broods of between 11 and 16 young.

Of the eight species of *Hodogenes* found in Southern Africa only one the *H. troglodytes* occurs in the Matobo Hills.

According to Minshull (1989) the species *H. granulatus* occurs throughout Zimbabwe and is common north of the highveld watershed. However up to now it has not been collected in the Matobo Hills.

Specimens collected in the hills were not found to be aggressive and rarely attempted to sting but did face the capturer with open and raised claws.

Genus *Opistacanthus*

Species *Opistacanthus asper*

This species is dark in colour with an orange tip to the tail and orange/brown legs. Two specimens caught in the Mpopoma Dam area had yellow legs, which was most unusual. This scorpion is a lot smaller than the Granite Rock Scorpion and specimens are about 10cm in length. They are generally quite slow moving and not aggressive. In the Matobo Hills they were often recorded under the bark of trees and in particular Mopane and Acacias.

Family *SCORPIONIDAE* (Burrowing Scorpions)

Genus *Opisththalmus*

Species *Opisththalmus glabrifrons*

Another large scorpion but not exceeding 130mm in length. This scorpion is found in holes in the ground and in the Matobo Hills often at the base of rocky outcrops or in areas of short grass. Specimens caught at Mtshелеle Dam lived in burrows, which ranged from 15 to 30cm deep.

O. glabrifrons is a very attractive scorpion with golden legs and light brown pedipolps. Several specimens caught at the Maleme dam campsite had bright orange/yellow Carapaces. The tergites are usually dark brown to black.

Family *BUTHIDAE* (Thick-tailed Scorpions)

Genus *Uroplectes*

Species *Uroplectes carinatus*

A small scorpion rarely exceeding 50mm in length. An attractive species with dark yellow/orange colour. Some specimens are dark orange/brown often with a single dark stripe down the body to the tergites. This species had not previously been recorded in the Matobo Hills and on 18th November, 2003 two adult females were collected at Togwana Dam. Both scorpions were light yellow with a narrow dark strips down its body to the tergites.

Another specimen was found at Mtshелеle dam in December 2004 during a natural History Museum trip to the area. These records are new for the Matobo Hills.

The two specimens collected at Togwana Dam in November 2003 were found close to the dam under some small slabs of rock on open ground and well away from the main large boulders and “dwalas” in the area.

Species *Uroplectes planimanus* (Flat striking scorpion)

This is the largest species of the Genus *Uroplectes* and often reaches up to 80mm in length. It is very common in the Matobo Hills and specimens were recorded throughout the area. Wherever there are

rocky outcrops and loose slabs of granite under which it could hide the species was found. It is characterized by very wide pincers and females have a sickle-shaped basal pectoral tooth.

Species: *Uroplectes flavoviridis* (Golden green striking scorpion)

Another very common scorpion occurring throughout the hills. It is a very beautiful scorpion with a brown yellow/green tergite and yellow-brown legs. Females are more often encountered than males and during the study at least three times more females were recorded than males.

Like the flat striking scorpion this species occurs throughout the hills particularly where there are rock exfoliations.

Species : *Uroplected vittatus*

A small scorpion and of 21 specimens examined (most released) not one exceeded 71mm in length. This species is common in the Matobo Hills and are nearly always found under the bark of trees, especially fallen logs. A number of people living in the communal areas south of the National Park have reportedly being stung by scorpions while collecting firewood. As the preferred habitat for *U. vittatus* is under the bark of trees it is most probably this species which caused the stings that most people complained of.

Genus *Parabuthus*

Species *Parabuthus raudus*

Of the many species of *Parabuthus* occurring in Southern Africa only one species of *Parabuthus* occurs in the Matobo Hills.

Four specimens have been collected in the hills and this represents a new species for the area. Three of these were females and one male. The females measured between 130 and 148mm long and the male 168mm long. All specimens were dug out of holes in the ground, two of which were at the base of *Aloe exelsa* plants, one in debris between two large boulders and the fourth under a dead fallen log.

Parabuthus species are exceedingly aggressive scorpions and when disturbed will sting readily. They have highly toxic venom which causes excruciating pain and a burning sensation.

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