

# Mammals

## News Bites

The newsletter of the  
Tanzania Mammal Atlas Project

### Project Update

## Tanzania Mammal Atlas Project

By Alexander Loiruk Lobora

Dear readers,

Once again welcome to our 4<sup>th</sup> edition of the Tanzania Mammals Newsbites, the newsletter for the Tanzania Mammal Atlas Project (TMAP). In our 3<sup>rd</sup> edition, we informed you about the project achievements since the beginning of the project in November 2005 and the anticipated project work plans. If you missed the 3<sup>rd</sup> edition please visit the project website at [www.tanzaniamammals.org](http://www.tanzaniamammals.org) and download a free copy. In this edition, you will again have the opportunity to learn more about what transpired since the project inception to date as well as our near future plans. But first and foremost allow me to take this opportunity to thank you all for enduring your support to TMAP in various ways including sending in mammal sightings, telling others about our work, distributing copies of our newsletter and more importantly visiting our offices at the Tanzania Wildlife Research Institute (TAWIRI) Headquarters located at Njiro (opposite the Arusha Institute of Accountancy) to learn more about the project.

As mentioned in our first issue, the Tanzania Mammal Atlas Project (TMAP) was a three years project and started officially in November 2005 following a very successful Tanzania Carnivore Project (TCP) carried out by the Tanzania Wildlife Research Institute (TAWIRI) and the Zoological Society of

London (ZSL) from 2002 to present. This means that the funding for the project will be coming to an end towards the end of 2008. The big question which you might be asking yourself is that, has it achieved its objectives? Just to reiterate, TMAP aimed to help Tanzania meet its obligations under the International Biodiversity Convention by developing a National Conservation Action Plan for its mammal species. In order to achieve this, it aimed to strengthen national institutions and increase capacity to monitor and conserve mammal biodiversity by

- developing capacity to monitor mammal distribution and status in areas where little information is available;
- establishing protocols to monitor small and cryptic species, and
- collating all existing information in a centralized database with data on the distribution, status and, where possible, abundance, for all mammals excluding rodents, bats, insectivores, and marine mammals given the difficulty of monitoring such species.

The above steps would help generate sufficient data to establish an action plan that would be used as a framework to guide future conservation management and policy in Tanzania.

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### Editorial

Alexander Lobora  
Charles Foley  
Edwin Konzo  
Sarah Durant





Overall, the project made significant progress towards establishing A Conservation Action Plan for Mammals in Tanzania, which is the project ultimate objective. The project database continued to expand to 21,600 sightings covering 87 of our target species. Moreover, a historical database for mammals has also been established with about 10,600 sightings of 70 species. The coverage is much improved since our previous editions, showing more even coverage across the country, although there is still a bias towards protected areas where most survey work is undertaken.

Twelve intensive camera trapping surveys have successful been conducted namely in Mahale National park (Oct-Dec 2005), Arusha National Park (March-May 2006), Serengeti National Park (May-July 2006), Minziro lowland forest (Aug-Oct 2006), Coastal Tanga Forests (Nov-Dec 2006), Burigi/Biharamulo Game reserve (July 2007) and Zoraning/Saadani National Park (March-April 2007). Others are Ukaguru Mountains-Mamiwa catchment forests (August 2007), Muhuwesi Forest reserve (October, 2007), Moyowosi Game reserve (November, 2007), Ufiome Mountains (January-February 2008) and Gelai game controlled area (March-April 2008). These surveys have significantly improved our coverage especially in areas where we had major information gaps.



*One of our survey team during the survey at Gelai Game Controlled area. They are pictured in front of an active volcano Oldonyo Lengai.*

One of the aims of TMAP is to establish a mini library, both digital and hardcopy, of papers relating to mammal status, distribution and abundance in Tanzania that will be easily accessible to students and scientists stationed at TAWIRI. This took us almost four months to establish and the archive has now been developed with a reference list of all available literature, and each document has been coded to facilitate retrieval. A specially designed library cabinet has been installed in the reception area to house hard copies

of all the documents which visiting students and scientists will be able to sign out to read on the premises and all documents are also available digitally. This library has significantly expanded to about 14,000 manuscripts including books and journals. We continue to encourage you to feel free to visit our offices and make use of this free facility whenever is convenient to you.

The project has so far established a network of 250 individuals and organizations that have received project materials and submitted data. The majority of data contributors are from northern Tanzania, but we continue to expand our network to regions of low coverage such as the southern and western part of the country, mostly through direct contact with people known to be working in those areas. Traditionally we have sent prospective participants printed data collection forms with detailed instructions on how to fill them out. However encouraging people to send in the data forms have typically proven difficult, particularly with the high number of mammal species now being surveyed. In order to facilitate data gathering, project staff have continued to visit potential participants and conduct direct interviews with them, with particular emphasis on people in the safari business who spend a lot of time in the field. This approach is proving successful and staff allocate time in their work schedules every month for these visits, gathering data from drivers and staff. A total of 120 tour companies and tourist hotels were visited during the project and were persuaded to contribute data to the project. Project materials such as newsletters and our mammal checklist were distributed during these visits.

The project website has also been extremely useful for data gathering and information dissemination. The website has been developed in such a way that it allows users to fill in simple sighting information for each grid square. It provides frequent feedback to contributors through the provision of distribution maps. Since its establishment, the project website has been updated significantly. Current distribution maps have been updated from the database every two months, and historical information maps and their corresponding references have now been added for many of the larger ungulate species. Furthermore, the picture database emanating from our camera trap surveys has been expanded greatly while new species descriptions have been written and uploaded.

Last but not least, the first planning workshop to develop a Mammal Conservation Action Plan started in april this year. The planning process is a participatory and consensual process, using a similar approach to the one used successfully in the Tanzania Carnivore Project. A series of workshops, involving key stakeholders from government,

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the research community, conservation NGOs and the private sector takes place to establish conservation priorities. Each workshop focuses on a group of species namely for large ungulates; small ungulates; primates; rhino and elephant. The planning process started for the first in this series of workshops, for large ungulates, which took place from the 9<sup>th</sup> to 11<sup>th</sup> of April 2008. Each of these workshops will produce a proceeding which will eventually form a chapter in the final action plan. We endeavor to have the first comprehensive draft action plan for mammals in the country before the end of the year, all being well.

Although the current funding for the Tanzania Mammal Atlas Project will be coming to a close at the end of the year, the project will continue with funding from a variety of other sources, and will hope to build on the good work achieved so far. So please don't stop sending us your mammal sightings and do stop by to see us.

If you have questions or comments please don't hesitate to ask by sending an email to [carnivores@habari.co.tz](mailto:carnivores@habari.co.tz) and if you have information/data that you would like to share with us especially mammal sightings please send it to [carnivore-altas@habari.co.tz](mailto:carnivore-altas@habari.co.tz). Thank you for taking your time and it is our hope that you will continue to find our newsletter useful.

## Blue Duiker and Suni Identikit

By Charles Foley

Anyone who has spent a lot of time walking in forests in Tanzania will on occasion have caught a glimpse of a small antelope darting across the track or dashing off into the undergrowth before disappearing from sight. This is usually followed by a reflective 'hmmm, I wonder what that was...' before the sighting is pushed into the 'yet another unidentified mammal' column of the brain (trust me there is one). Actually some species are not that difficult to identify even from quick sightings. A large dark or red coated animal with spots or stripes is likely to be a bushbuck, whereas anything with a bright red coat is one of the red duiker species. Which red duiker is different matter, but we'll leave that for another day. The really tricky ones are the very small antelope that are uniform grey or dark colour. There are two small, darkish antelope in Tanzanian forests, which are both very common, and very difficult to tell apart: one is the

blue duiker and the other the suni. Several people have asked me for clues on how to separate the species, so after looking it up myself, I've decided to write an article about the issue using pictures from our extensive camera trap library for illustrative purposes.

In some parts of the country the blue duiker and suni don't overlap which makes identification easy. Broadly speaking the forests of the north and north-east have suni and the forests of the west have blue duiker. I have heard reports of blue duiker being seen in the bushland on the lower slopes of Arusha National Park and Kilimanjaro National Park, but if they're there they are very rare. The real problem comes in the coastal forests (Pangani, Zanzibar etc) where the two species are both quite common so a sighting could be either one - we're not sure about their distribution in other parts of the country so I can't comment on that.

From the pictures below you'll see two main differences which are reasonably good identification features. The first is body colour: blue duiker are a slaty-grey colour (Picture 1) while suni are light brown or a reddish brown colour (Picture 2). Of course if you see them at night or just catch a glimpse of the rear-end that won't do you much good. Fortunately you can also tell them apart just from looking at their rump. The blue duiker has a black stripe down the centre of the tail with two distinctive white stripes on either side of it (Picture 3). The suni on the other hand has a bushy tail which is uniformly coloured and generally the same colour as the body (Picture 4). Another helpful 'tail' feature is that the blue duiker tends to flicks its tail up and down, while the suni moves its tail from side the side.

A third distinguishing characteristic requires a good look at the animals face, but if you're luck enough to get this you'll notice that the pre-orbital gland on the suni is straight, while on the duiker it curves sharply underneath the eye. Granted most of these identification cues are fairly subtle, and do require a relatively good sighting of the animal, but with some practice one can become fairly proficient at separating the two. And if you've seen a small antelope and don't know what species it is, check the distribution maps on our website as those will give a good clue whether one or the other species is found in that area. Good luck!

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Picture 1: Blue duiker



Picture 2: Suni



Picture 3: Blue duiker tail showing white stripes



Picture 4: Suni tail is bushy and shows no white from behind

## Update of Cheetah and Wild Dog Rangewide Conservation Planning Process

Margaret Waweru, Sarah Durant and Rosie Woodroffe

The Cheetah and Wild dog Range Wide Conservation Planning Process was initiated in 2006, with the backing of the Zoological Society of London, the Wildlife Conservation Society and the IUCN Cat and Canid Specialist Groups. The aim of the process is to help reverse declines in the distribution and abundance of African wild dogs *Lycaon pictus* and cheetahs *Acinonyx jubatus* through the following actions:

- i) Establishment of an effective knowledge base of the species across their range,
- ii) Establishment of a strategic plan for the species' conservation and
- iii) Increasing the capacity of range countries to implement conservation for both the species.

The Project is Based at Tanzania Wildlife Research Institute (TAWIRI) headquarters in Arusha, Tanzania,

the project covers the African continent which is subdivided into eastern, southern, and northern/central/western African regions. The project involves development of strategic plans, national action plans and mapping wild dogs and cheetah across their range through a participatory process by species specialists from range states at regional and national workshops.

Two regional and national workshops have been held since the inception of the process. The first regional workshop for eastern Africa was held in February 2007 at Mpala Research Centre, Kenya, followed by a Kenya national workshop held at the Kenya Wildlife Society (KWS) offices at Nairobi, Kenya. Government representatives from five eastern African countries and species specialists and representatives from external and internal conservation supporting organizations attended both workshops.

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A second workshop for southern Africa was held in December 2007 at Jwana Game Park in Botswana, and was immediately followed by a national workshop at The Big Five Lodge in Gaborone. Eight countries were represented at the regional workshop and their representatives also attended the national workshop as observers.



*Delegates to the conservation planning workshop for African wild dogs and cheetahs in southern Africa, held at Jwana Game Park, Botswana in December 2007*

The eastern regional strategic plan and national action plan is now complete, and is currently with the representative state governments for endorsement. The Southern regional strategic plan and the Botswana national action plan draft reports are in progress. The distribution and status mapping of the species in the range states are complete as shown on the following figure.

Distribution of wild dog and cheetah in eastern and southern Africa as mapped from the workshop.

- (i) Wild dog distribution and status
- (ii) Cheetah distribution and status

Other national workshops in the range states are currently in preparation, notably the Sudan national workshop which is scheduled to take place before the end of 2008.

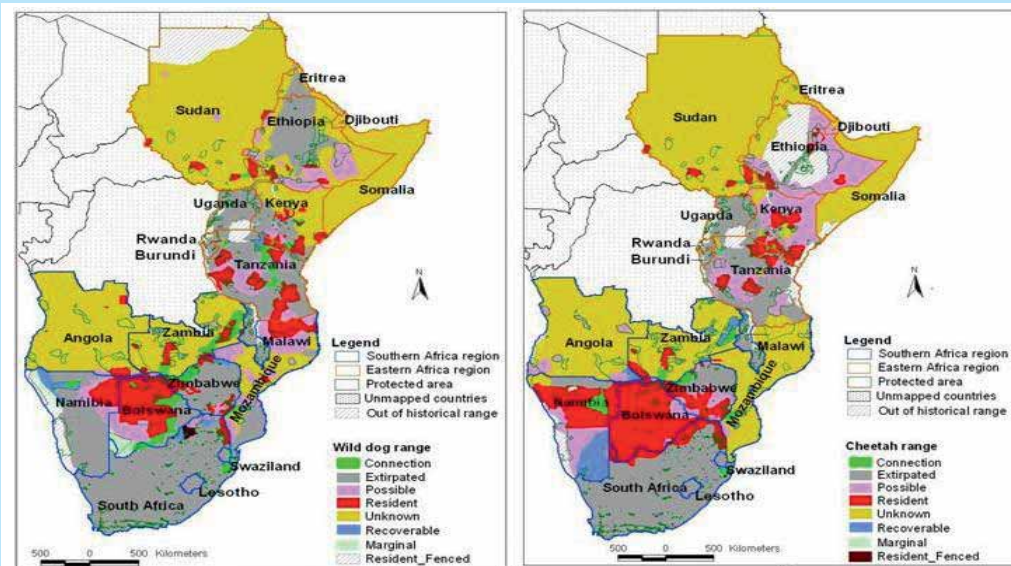
The project has established database for eastern and southern Africa which is updated as data is received. Some of the key issues is inconsistency in data availability for different countries which means that the status of the two species is unknown in large areas in both regions. Sadly it also appears that both species have been extirpated from large areas.

Our attention is now turning to the remaining cheetah and wild dog populations still persisting in northern, western and central Africa. It is anticipated that the workshop for these regions could be done in 2009 subject to the availability of funds.

Our database is built by continuously updating the information sent in by contributors, thus details of any sightings of cheetah or wild dog anywhere in Africa would be gratefully received by the project, particularly in areas off the beaten track. You may assist us with this information by reporting your sighting on the website [http://www.zoo.cam.ac.uk/ioz/projects/cheetah\\_wlldo.g.htm](http://www.zoo.cam.ac.uk/ioz/projects/cheetah_wlldo.g.htm) or/and if you have contacts

of people who may have information on the species', you may send these contacts to [catsanddogs@habari.co.tz](mailto:catsanddogs@habari.co.tz). The project depends on such information to develop and inform regional conservation strategic and national action plans for the range states, and is critical for planning conservation initiatives.

***Distribution of wild dog and Cheetah in Eastern and Southern Africa as mapped from the workshop***



*(i) Wild dog distribution and status*

*(ii) Cheetah distribution and status*



## Tanzania Carnivore Conservation Action Plan A Solution for Conservation Threats in Tanzania

By Rose Arthur Masha

Previous decades have seen a drastic reduction in global carnivore populations. Carnivores continue to decline, primarily due to conflicts with human activities and habitat fragmentation. In 2002 TAWIRI implemented the Tanzania Carnivore Project (TCP) to address the particular threats faced by carnivores. This project was a collaborative project between the Tanzania Wildlife Research Institute (TAWIRI) and Zoological Society of London (ZSL) with funding from the Darwin Initiative of the UK Government. The project aimed to generate information on the status of carnivores across Tanzania and to develop a National Action Plan for Carnivore Conservation. The project partly relied on information from the private and public sector to achieve its aim, and greatly benefited from data contributions from a variety of sources, particularly from the tourism sector.

Towards the end of the project, a National Carnivore Conservation Action Plan was developed through a series of five workshops involving key stakeholders including Tanzania National Parks, Wildlife Division, Ngorongoro Conservation Area Authority, conservation NGO's as well as TAWIRI, the host institution. The plan produced evidence that at least 35 species of carnivore exist in the country - nearly half the carnivores species occurring on the African continent, which shows how important Tanzania is to carnivore conservation globally. The plan summarises the current status of knowledge, information gathering methods and conservation threats for all these species and lists their key conservation priorities. The plan is broken down into five chapters representing each workshop: Cheetah; Wild dogs; Lion and Leopard; Hyaenids; and small to medium carnivores.

The Action plans also details which priority activities are to be initiated by stakeholders in order to successfully conserve carnivores in the country. However, if the plan is to be successful, steps need to be taken to ensure that these activities are implemented. As part of this process, I have been appointed as the new carnivore action plan co-ordinator at TAWIRI, and I am tasked with overseeing the implementation of the plan. My role includes disseminating information, providing advice and assistance in particular activities, and promoting the importance of the plan to all stakeholders.

Because of its wide variety of habitats, Tanzania is rightly recognized as a hotspot for African carnivore biodiversity, and has globally important populations of many species. The country is thought to hold one third of the world's lions and wild dogs, and 10% of the world's cheetahs. By implementing the Carnivore conservation action plan we will help mitigate threats to these carnivores and others in Tanzania. Every one is invited to play his/her part. THANKS !

The plans can be obtained from the project website at [www.tanzaniacarnivores.org](http://www.tanzaniacarnivores.org). For more information you can contact us through [carnivoreaction@habari.co.tz](mailto:carnivoreaction@habari.co.tz)



[carnivores@habari.co.tz](mailto:carnivores@habari.co.tz)





## Serengeti Cheetah Project Update

By Laura Simpson

Last wet season was anything but dull. It started on a very sad note when Piper was found dead at the Ndotu woodlands. The cause of death was not obvious; there were no puncture wounds or scratch marks suggesting he had come into conflict with a lion or another cheetah. To get a better idea of what caused his death we got in touch with the carnivore disease project who asked us to bring tissue samples and the head (which is needed to test for rabies) back to the laboratory for further investigation. Under normal circumstances this is what we would have done, however Pipers loyal brother Bollinger was still by his side, and since he wasn't calling we thought maybe he hadn't realized that his brother had died. To avoid causing Bollinger even more emotional stress, we asked the vets to come and do the post-mortum out in the field. Bollinger spent the whole day and night with his brother, protecting him from scavengers, but the next morning he seemed to recognize that his brother had died, as he called out for him for a while, and then left. Luckily this story doesn't end too sadly as Bollinger has now hooked up with AH473 who was Gingers cub. The two have formed a coalition and were last seen around Barafu. Males will often form a coalition, either with their brother, or another unrelated male, which is helpful when holding a territory.

Unfortunately Piper was not the only cheetah to pass away over the last couple of months. On the 13th of February another male cheetah was reported dead at Gol Kopjes. With the help of a group of tourists, and the rangers of Naabi gate, the mystery of this death was solved. First thing on the morning of the 14th I went to Gol Kopjes to see if I could identify the carcass. The rangers brought me to the body but it was unidentifiable. However, the day before one of the rangers had taken a picture of the cheetah with his phone which was of good enough quality to identify the individual as a male called Pinenut. That night around the ndutu campfire I was talking to a group of tourists and I mentioned the death of Pinenut after which they told me they had seen a fight between 3 cheetahs the day before. After exchanging pictures, I learned that Pinenut had been in a fight with Maurus and Jerome, the territorial holders of Gol Kopjes. This example really illustrates the importance of working together with tourists via the cheetah watch program as well as the park authorities. Without their help, the identification and cause of death of this individual would have remained a mystery.

On a more positive note a number female cheetahs have had new litters, the most famous of which has to be Eleanor. Eleanor became the most talked about cheetah of the Ndotu plains this year after she appeared in January with no less than 6 cubs. As January is the peak month for tourism many

visitors were able to enjoy watching her and follow the antics of the cubs. The gang of 7 has since moved more north across the Ngorongoro Conservation Area/Serengeti boundary into the Kusini area where they were last seen in the beginning of June 2008.

Loopy Lou and Kate left us all a bit confused at the beginning of the year. Kate is Loopy Lou's female cub from a previous litter. At the start of the wet season both of them had 3 cubs each. Eventually Kate was found with only 2 cubs and we assumed that the 3rd cub had died. However shortly after that a mother was found with 4 big cubs. At first sight we had no idea who she was but after entering her through the computer matching program we learned that it was Loopy Lou, and that the fourth cub with her was Kate's cub. This was very exciting news as adoption does not happen very often. It is believed that cheetahs adopt cubs from other females because the more cubs they have the higher the chances that all the cubs survive. Cheetah mothers will leave their cubs at around 18 months, after which the siblings stay together until they are sexually mature which is usually around the age of 2 years, when they become independent. Brothers will stay together forming a coalition, and females become solitary. The siblings are still quite vulnerable during this gap between the time when the mother leaves and when they become independent, so the more of them there are, the easier hunting becomes, and the more eyes there are to watch out for potential dangers.

Among the other cheetah mothers that we are currently monitoring, Tiramisu has two cubs that are almost ready to become independent, Almond has two female cubs who are real car jumpers, and Pecan with her two male cubs has been seen all over the southern Serengeti. Madeline was seen with three very small cubs around the Ndotu marsh, although it has been speculated that lions might have killed the majority of them. There are some first time mothers as well. Courtney was last seen with three very small cubs at cub valley, and hopefully she will be more successful in looking after them this time, while Nathalie was seen at Simba kopjes with a three month old cub. Fingers crossed that most of them reach independence.

Lastly a little update on the cheetah watch campaign. The cheetah watch campaign was set up in 2000 with the aim of following cheetah movement by analyzing photos sent in by tourists. This wet season we have had a very active response from the ndutu area which is fantastic. To try and get a greater response from the other parks, including the parks in the south, we decided to attend the karibu fair and distribute as many cheetah watch folders as possible, to camps and lodges. The response at the fair was very positive, so hopefully our Cheetah watch sightings will increase. Again, this illustrates that the success of the Serengeti Cheetah Project depends on the collaboration of many people, to which we'd like to say: THANKS.





## The Tanzania - UK Science Networking Scheme and the Maswa Survey

By Nathalie Pettorelli

Biodiversity conservation is becoming an increasingly urgent imperative in the face of accelerating degradation of natural ecosystems, and effective conservation partly depends on our ability to measure and monitor biodiversity change. In 2007, the Royal Society in the United Kingdom inaugurated a new application scheme, aiming at promoting science networking activities between Tanzania and the UK. Thanks to this scheme, 2 researchers from London (Marcus Rowcliffe and Ben Collen) were brought to Tanzania for the first time to increase collaboration between the Zoological Society of London and the Tanzanian Wildlife Research Institute. The proposed networking activity aimed to address the disjunction between scientists with practical expertise in monitoring biodiversity loss and those with the analytical and theoretical expertise relevant for analysis by bringing scientists from both activities together in Tanzania, which is a key country for biodiversity conservation in Africa and a signatory to the Convention on Biological Diversity.

Shortly after their arrival on the 6<sup>th</sup> of June, the UK team, as well as Sarah Durant, Maurus Msuha, Alex Lobora, Edwin Konzo, Zawadi Mbwambo and I joined the TMAP/TCP survey team in Maswa, a beautiful Game Reserve lying along the western boundary of the Serengeti and abutting the south-western corner of the Ngorongoro Conservation Area. Although the reserve borders the Serengeti plains, the two areas differ substantially: the reserve indeed consists mainly of river valley thickets and acacia parkland, with the only areas of open grassland being in the North and in the extreme South-East, adjacent to the Ngorongoro Conservation Area. Maswa Game Reserve was created in 1962, to act as a buffer zone for the Serengeti National Park and to allow tourist hunting of wildlife within the Serengeti ecosystem. The aim of this field trip was to confront UK biologists to the reality of monitoring biodiversity in Tanzania.

When we arrived at the camp set up by the team days ago, 40 cameras were already deployed, and our 2 teams had a remaining 40 cameras to deploy. We started by targeting the South of the reserve, an area we soon discovered to be highly attractive to tsetse flies. In this first day, 16

cameras were deployed, and dozens of tsetse flies were squashed, leaving some characteristic blood stains on the cars' windows. Sightings during that day included roan antelopes (for the lucky ones), klipspringers, ground hornbills, buffalos (some from a very, very close distance...), impalas, giraffes, baboons, Vervet monkeys, black-backed jackals, banded mongooses, and elephants.

The second day, we decided to go North to deploy the remaining cameras, and targeted the open grasslands, an area where we spotted, among others, migrating wildebeest, ostriches, zebras, hartebeest, and a beautiful long crested eagle (we had a devoted birder with us...). In the last evening we also decided to set up two digital cameras near by the camp, to try to "capture", among others, the hyaenas we heard the night before.

Days go fast in good company and on the morning of the 4<sup>th</sup> day, we left our fantastic hosts, the camp, the siafu, and the tsetse flies for the long drive back to Arusha. On the road between Kusini and Ndotu, we were lucky enough to meet Eleanore, the proud mum-of-6 cheetah cubs (see the cheetah update in this newsletter): the cubs were delighted to have us (actually, our cars) around for a while, and we ended up providing shade to the family for a little while. The journey back took us more than 12 hours and all reached civilisation knackered and full of dust, but this dedicated team of scientists were all present the next morning in the meeting room of the Carnivore Centre in Arusha, to start a 3 days discussion on protocols, analyses, and possible collaboration. Those discussions will hopefully lead to exciting projects, which will make use of new sophisticated statistics and remote sensing data to analyse our growing data set and shed light on the increasing impacts of environmental change on the rich mammal biodiversity in Tanzania.



*Survey Team in Maswa Game Reserve*

## The Tanzania Mammal Database

By Edwin Konzo

Dear readers we would like to draw your attention to the status of the Tanzania Mammal database. The database is being developed as a cross-cutting effort between you who are sending us data and the Tanzania Mammal Atlas Project (TMAP) team who are both collecting and processing the data. I'm taking this opportunity to thank you all for your efforts that you have been making on behalf of the Tanzania Mammals Atlas Project since its inception in November 2005 to date, and requesting you to continue with this for the betterment of mammal conservation in Tanzania for the coming generation. The project database is now approximately 24 months old and has about 21,600 mammal sightings of 87 mammal species. With this data we have produced 87 mammal distribution maps which are posted

on the project website at [www.tanzaniammammals.org](http://www.tanzaniammammals.org), so please visit the website for the update. You can add sightings directly on the website, so if you have any information (even for common species like Vervet monkeys) please do not hesitate to send it to us via the website or via email at [carnivore-atlas@habari.co.tz](mailto:carnivore-atlas@habari.co.tz). We promise to keep you posted on our updates from time to time. Thank you for all your help.

Top 5 data contributors from August 2006 – April 2008

1. Janemary Ntalwila, Istituto Oikos
2. Jules Knocker, Nomad safari
3. Claire Lewis, Grumeti Reserves
4. Anne Hilborn, Serengeti Cheetah Project
5. Ryan Shallon, Kilombero

The database contain 21,600 data entries up to April 2008

- 9576 from contributors such as you
- 5818 from camera trap surveys
- 6206 from TAWIRI Aerial count surveys