3rd Issue October 2007 - March 2008

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 the 3rd issue of the Tanzania Mammals Newsbites, the newsletter for the Tanzania Mammal Atlas Project (TMAP). In our 2nd issue of TMAP Newsbites, we informed you about the project achievements since the beginning of the project in November 2005 and the anticipated project work plans for the next quarter. If you missed the 2nd issue please visit the project website at www.tanzaniamammals.org and download a free copy. In this issue, you will again have the opportunity to learn more about what transpired since the 2nd issue came out last April 2007 and also our near future plans. First and foremost may I take this opportunity to thank all of you 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.

Since the previous issue, the project made significant progress towards establishing A Conservation Action Plan for Mammals in Tanzania, which is the project's ultimate objective.

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A camera trap survey of Saadani National Park

By Charles Foley

Located on the coast roughly equidistant between Dar-es-Salaam and Tanga, Saadani is one of the newest National Parks in Tanzania. It was formally gazetted in 2003 and created from an agglomeration of several separate parcels of land including Saadani Game Reserve, Mkwaja Ranch (a former cattle ranch) and the 20,000 hectare Zoraninge Forest Reserve. The key attraction of the park is that it is one of the few places in Tanzania where savanna and coastal fauna intermix. Elephant, buffalo and lions wander onto the beaches at night – we saw plenty of tracks - and small pods of bottle nose dolphins can sometimes be seen in the waters off the shore. The vegetation ranges from open bush/woodland which covers the majority of the park, to large open marshes and dense forest in Zoraninge. The forest is one of the few places to escape the blazing heat of the tropical coast (trust me, a game drive at midday is not a good idea), and it is well worth a visit. The forest has suffered from logging in the past, but there are still many good sized trees and this is probably one of the largest and most intact remaining pieces of coastal forest in the country.

The TMAP survey team set up a camp on the edge of the forest in early June this year and started setting up heat-triggered camera traps along a grid concentrated along the north and western side of

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In this Issue

Editorial

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Project Update from page 1

The project database continued to expand from 10,000 to 19,000 sightings which is a proof that more and more people are now aware of the project goals and are providing a steady flow of data. Furthermore, three camera trapping surveys planned for March to August 2007 were successfully completed. In addition, we have been able to produce distribution maps for 87 mammal species and recently posted them on the project website so please visit the website for the updates as well as the most up-to-date information on which species of larger mammal are believed to be found in Tanzania today. We will also very shortly be uploading maps with historical data on mammal distributions in Tanzania stretching back to the 1950's so you will be able to compare former and current distributions. We hope that you will find this website useful and helpful towards conserving our precious mammal species in the country.

Camera trapping surveys carried out by the project continued to yield enormous data to our database. Since the last issue of the mammal Newsbites, we have been able to conduct three surveys using remote cameras in Zoraninge/Saadani National Park, Burigi/Biharamulo Game Reserve and the Ukaguru mountains. Some of the interesting species detected by our remote cameras from the above surveys include several pictures of African palm civet and Bushy tailed mongoose as well as three species of elephant shrew-the Chequered, Four toed, Zanje elephant shrews. The Chequered elephant shrew was photographed in Burigi, which represents a major range extension for the species in Tanzania, as it was previously only known to occur from the south and south-western parts of the country.

Subsequent survey areas this year include Tongwe/Pande in Tabora (an area between Ugalla Game Reserve and Mahale National Park), Katavi National Park, Muhuwesi which is an area adjacent to Selous Game Reserve in the south and Forests near Babati west of Tarangire National Park. As usual we take this opportunity to welcome you to give ideas, comments and recommendations on the above proposed areas for next surveys, though taking into account the cost and time involved in undertaking this work, Priority will be given to areas with high biodiversity of mammal species that have not been surveyed before or were surveyed a longtime ago. We look forward to your continued support and we promise to keep you posted on the project updates. If you have questions please don't hesitate to ask by sending an email to info@tanzaniamammals.org and if you have information/data that you would like to share with us especially mammal sightings please send it to edwin@tanzaniamammals.org. Thank you and it is our hope that you will find this issue enjoyable, informative and educative!

A camera trap survey of Saadani National Park from page 1

the forest. There were plenty of wildlife trails in the forest suggesting a healthy population of small mammals and the team set up the traps along these trails to maximize the chance of photo-trapping wildlife. Once the camera traps have been set up there is little to do except wait, so the team filled their time by visiting different areas of the park and recording the wildlife they saw along the way. After many years of hunting, mammal populations are not surprisingly fairly low. Giraffe, Warthogs, Blue monkeys and Yellow Baboons are the most commonly seen mammals, though there are also scatterings of Blue wildebeest and Lichtenstiens hartebeest (both re-introduced some years back), as well as Burchell's zebra, Eland and Bohor reedbuck. The Angolan Black and White colobus monkey is also not uncommon in areas of denser vegetation.

But the camera traps with their never sleeping eye tell a whole different story of what's around. The Zoraninge forest abounds with small antelope; Suni were by far the most abundant species trapped, but Blue duiker, Harvey's red duiker and Bushbuck were also common, and we recorded a few Grey duiker on the edges of the forest. Rufous and Black (or Zanj) elephant shrews and Four-toed elephant shrews were also recorded frequently, and the Giant pouched rats were ubiquitous. Carnivores were naturally less abundant, though there appears to be a healthy population of Large spotted genets and African Civets, and we also recorded one Bushy-tailed mongoose. Other notable records were a large number of Bushpigs – some of which were very red, with a passable resemblance to the Red River hog of central and western Africa, and a couple of Aardvark bumbling along their way.

Combining our camera trapping and sighting data with reports provided by local people and TANAPA, we have produced a preliminary mammal species list for Saadani National Park. It is likely that several species of mongoose are missing as well as some of the smaller cats and the galagos, so if anyone has any further records not on the list please let us know so we can update it.

Preliminary mammal list for Saadani National Park

Common name	Latin name	Mammals Camera trapped	Mammals seen by TMAP team	Mammals reported by local people or literature	Reported by lodge managers or TANAPA staff
Small eared galago	*Otolemur garnettii*				√
Large eared greater galago	*Otolemur crassicaudatus*				√
Rondo galago	*Galagoides rondoensis*				√
Zanzibar galago	*Galagoides zanzibaricus*		√		√
Vervet monkey	*Allenopithecus nigroviridis*	√			
Blue monkey	*Cercopithecus mitis*	√			
Yellow Baboon	*Papio cynocephalus*	√			
Angolan Black and white colobus	*Colobus angolensis*	√			
Black backed jackal	*Canis mesomelas*				√
Wild dog	*Lycaon pictus*			√	
African clawless otter	*Aonyx capensis*			√	
Honey badger	*Mellivora capensis*				√
Civet	*Viverra civetta*	√	√		
Large spotted genet	*Genetta tigrina*	√			
Bushy tailed mongoose	*Bdeogale crassicauda*	√			
Dwarf mongoose	*Helogale parvula*		√		
Banded mongoose	*Mungos mungo*			√	
Marsh mongoose	*Atilax paludinosus*				√
Spotted hyaena	*Crocuta crocuta*				√
Caracal	*Felis caracal*				√
Lion	*Panthera leo*		√		
Leopard	*Panthera pardus*		√		
Savanna elephant	*Loxodonta africana*		√		
Burchell's zebra	*Equus burchelli*		√		
Aardvark	*Orycteropus afer*	√			
Warthog	*Phacochoerus africanus*	√			
Bushpig	*Potamochoerus porcus*	√			
Hippopotamus	*Hippopotamus amphibius*				√
Giraffe	*Giraffa camelopardis*		√		
Lichtenstein's hartebeest	*Alcelaphus lichtensteinii*		√		
Blue wildebeest	*Connochaetes taurinus*		√		
African buffalo	*Syncerus caffer*	√	√		
Cape eland	*Taurotragus oryx*		√		
Sable antelope	*Hippotragus niger*				√
Oryx	*Oryx beisa*				√
Greater kudu	*Tragelaphus strepsiceros*				√
Bushbuck	*Tragelaphus scriptus*	√			
Harvey's duiker	*Cephalophus harveyi*	√			
Blue duiker	*Cephalophus monticola*	√			
Grey duiker	*Sylvicapra grimmia*	√			
Suni	*Neotragus moschatus*	√			
Common waterbuck	*Kobus ellipsiprymnus*		√		
Bohor reedbuck	*Redunca redunca*		√		
Ground pangolin	*Manis temminckii*			√	
Crested porcupine	*Hystrix cristata*	√			
Red squirrel	*Paraxerus palliatus*	√			
Cape hare	*Lepus capensis*		√		
Four toed elephant shrew	*Petrodromus tetradactylus*	√			
Black and rufous elephant shrew	*Rhynchocyon petersi*	√			
Humpback whale	*Megaptera novaeangliae*				√
Indo-Pacific Bottlenose dolphin	*Tursiops aduncus*				√

The Cheetah and Wild Dog Rangewide Conservation Planning Process

By Margaret Waweru, Sarah Durant and Rosie Woodroffe

African wild dogs, *Lycaon pictus* and cheetah, *Acinonyx jubantus* used to be widespread across Africa but today remain in few isolated regions. Even so, the remaining populations in Africa have suffered enormous declines in the twentieth century and today most of the surviving populations are mainly concentrated in eastern and southern Africa. Nevertheless, in the few pockets where they remain, they continue to suffer declines from various factors like habitat change, carnivore competition and diseases.

Wild dogs in Okavango delta, Botswana.
Source: Megan Parker, Wild dog Project, Botswana

Cheetah in Serengeti National Park,
Serengeti Cheetah Project, Tanzania
Source: Sarah Durant – ZSL, WCS.

The precarious situation of wild dog and cheetah urgently requires a response if their long term conservation is to be assured. Coincidentally, cheetahs and wild dogs have very similar conservation requirements, and so planning for one species is likely to benefit both. For this reason, a 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 IUCN Cat and Canid Specialist Groups. The process ultimately seeks to help reverse declines in the distribution and abundance of African wild dogs and cheetahs through 1) establishing an effective knowledge base of the species across their range, 2) establishing a strategic plan for cheetah and wild dog conservation and 3) increasing the capacity of range countries to implement conservation for cheetah and wild dog. The project has an office based at the TAWIRI headquarters in Arusha, Tanzania.

The project covers the African continent subdivided into eastern, southern, and northern/central/western African regions. To achieve our goal, one of the first priorities is to map the distribution of current populations, and this entails collating data on the distribution and, where possible, abundance of wild dogs and cheetahs. The project thus involves mapping wild dogs and cheetahs across their range. We are building and continuously updating the database, so if you seen or have seen cheetahs or/and wild dogs anywhere in Africa you may be able to help by reporting your sighting on this website http://www.zoo.cam.ac.uk/ioz/projects/cheetah_wilddog.htm or/and if you have contacts of persons who may have information on the species, you may send these contacts to castanddogs@habari.co.tz. This information will be used to develop and inform regional conservation strategic and national action plans for the range states, and is critical for planning conservation initiatives. The development of strategic and national action plans is done through a participatory process through regional and national workshops.

The project has already established an eastern African database for cheetahs and wild dogs and held its first regional workshop in Kenya for the ten countries representative of the region. During this workshop, the eastern regional strategic plan was drafted. The final report of the strategic plan and the workshop proceedings are in their final stages of completion. It was followed by a national action plan model development workshop in Nairobi, Kenya, where the regional strategy was immediately adopted by the Kenyan authorities for its cheetah and wild dog national action plan.

Some of the key observations that arose from the regional mapping analysis are that there is inconsistency in data availability for different countries, the status of the two species is not known in large areas in the north and east of eastern Africa (Sudan, Eritrea, Djibouti and Somalia), and that known extirpated areas for the species are mainly in the west and south of the region and some parts of Ethiopia. Tanzania, thanks to the Tanzania Carnivore Program, notably is one of the countries with the best knowledge base for both cheetah and wild dog.

Delegates to the conservation planning workshop for African wild dogs and cheetahs in eastern Africa, held at Mpala Research Centre, Kenya in February 2007.

We are currently working on the establishment of species databases for other African regions. In the next few months, the southern African database, species population distribution mapping and hopefully a regional strategic plan and a national action plan for Botswana will be drafted before the end of the year 2007. Then we will turn our attention to the remnant cheetah and wild dog populations still persisting in northern, western and central Africa. Details of any sightings of cheetah or wild dog would be gratefully received by the project, particularly in areas off the beaten track.

Genetic tools use to unveil mating system in Serengeti cheetahs

By Dada Gottelli

Molecular genetic techniques are powerful tools that are able to offer new insights in aspects of a species evolution and behavioral ecology. Genetic studies can be used to resolve issues like relatedness and parentage that can be difficult to uncover through behavioral observations alone, especially among elusive large carnivores. But why it is important to understand mating systems? Among cheetahs in the Serengeti National Park the knowledge of their mating system and the transmission of paternal genes from generation to generation are not just of academic interest. Cheetahs are threatened species and are declining throughout their range. Large carnivores, in general, live at low densities, but some of the less competitive species, such as cheetah, are at even lower density, due to competition from other larger carnivores in the ecosystem, like lions and hyaenas. As populations become increasingly fragmented with the global acceleration in land use change and habitat degradation, cheetah are likely to become vulnerable to losses of genetic diversity. Such losses can be prevented through a sound genetic management strategy, but this needs to be based on accurate knowledge of how genetic diversity is maintained in wild populations.

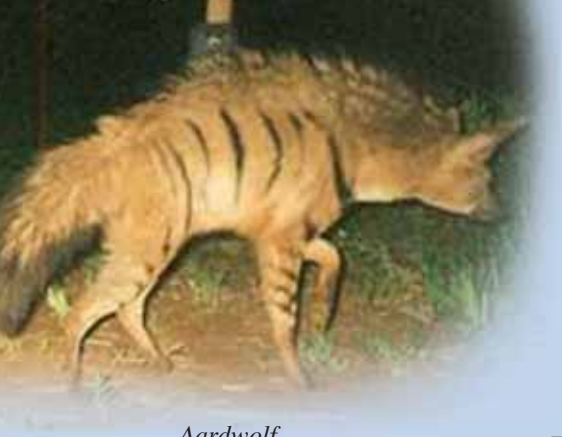
As cheetah mating is rarely observed in the wild, it has been impossible to study the mating system directly. In the Serengeti we therefore made use of DNA extracted from feacal samples of known individual cheetahs to screen 13 genetic loci. The samples were collected in a non invasive way, from known individuals observed to defecate. The genetic data was combined with 9 years of accurate long term field records, to unveil the mating system of the species.

Cheetah have a combination of ranging patterns and social system unique in mammals, whereby male coalitions occupy territories much smaller than the large home range of solitary females. Males try to monopolize and manipulate sexually receptive females to ensure the paternity of the cubs. But if female cheetahs are prevented from mating with the best partner it is expected that females should evolve ways to counterbalance this disadvantage.

Our genetic analysis provided evidence that female cheetahs are promiscuous, with high levels of multiple paternities within a litter and no evidence of mate fidelity between reproductive seasons. Suggesting that in the Serengeti NP female cheetahs are choosing to mate with several different males in a single reproductive attempt. Our results also revelled that a high number of males living outside the study site and potentially outside the park are contributing substantially to the gene pool of the population.

This finding reinforces the crucial role that high mobility plays in cheetah ecology and their conservation. The understanding of the mating system of this cheetah population will aid in the development of future management plans aimed at maintaining genetic diversity of cheetahs within and outside protected areas.

The full scientific article is available at the Tanzania Carnivore Centre library, please email for more information.



Aardwolf

Human Impacts on Carnivore Biodiversity Inside and Outside Protected Areas in Tanzania

By Maurus Msuha

Tanzania is home to at least 36 carnivores which is nearly half of the species found in the African continent, including threatened species e.g. the cheetah and African wild dog. Comparing with other taxa, carnivores present a major challenge to conservation globally. This is because carnivores require extensive and intact habitats to survive which are increasingly becoming scarce due to human activities. Traditionally, conservation throughout the world is characterised by the establishment of protected areas (PAs). For instance, the number of PAs globally has increased from 8,641 in 1992 to 100,000 in 2005. Although PAs are important for *in situ* conservation, the approach has been difficult to implement in many settings, particularly in developing countries. This is due to the fact that some PAs are too small to sustain viable wildlife populations, particularly large carnivores which have large home ranges. PAs are also expensive to maintain and often need external funding. Furthermore, some species tend to disperse outside the PAs. This means that the presence of unfenced and uncultivated land outside PAs is important as a refuge. However, as human population increases outside PAs, demand for resources also increases along with changes in land tenure and land use. Tarangire ecosystem in northern Tanzania presents a good example where the land use changes is fast due to cultivation which replaces nomadic pastoral systems with sedentary agro-pastoral systems. These changes in land use and increased human population can have serious consequences for many carnivores. Therefore understanding the impact of human activities on carnivores is fundamental for developing effective conservation strategies.

Steinbuck

This project aims to investigate impact of human activities on carnivore biodiversity in the Tarangire ecosystem, particularly the Tarangire National Park, grazing areas and farmlands outside the park in Simanjiro and Monduli districts. This project is implemented in collaboration with Sarah Durant and Chris Carbone of the Zoological Society of London and Katherine Homewood of University College London. We collect information on the distribution and abundance of carnivores and herbivores in the three land use types using remote cameras and relate it to human activities e.g. distance to villages, roads and waterholes in order to identify key human activities which affect the species. The project will also compare methods for monitoring carnivores and herbivores, document the use of carnivores in traditional medicine and other cultural practices, and investigate conflict between farmers and carnivores recorded in farmlands. In a pilot study we recorded a total of 18 carnivores in the park and 6 in farmlands outside the park. Leopards were particularly abundant in the park and we have estimated their density as 8 adult individuals per 100 km^2. Preliminary results from interviews with traditional healers in the Simanjiro has shown that a total of 14 carnivores are used in traditional medicine and other cultural practices. We will keep you posted with more results once the data is analysed.

Interview with traditional healer

Population fluctuations in the Serengeti Migratory Wildebeest

By Simon Mduma and Alexander Lobora

The Serengeti wildebeest population is perhaps the best known of the large migratory grazing systems of the world. This species is the keystone that determines the rest of the Serengeti ecosystem and consequently its viability is the major management goal for conservation in this region of Tanzania. Information on its population ecology has accumulated for 40 years, and although analyses have been conducted at intervals, a complete synthesis was not made until 1999 when a paper was published in the journal of Animal Ecology by a team of experts lead by Dr. Simon Mduma entitled "Food regulates Serengeti Wildebeest, A 40 year record".

Wildebeest censuses started in 1958 when the population was estimated at around 200,000 individuals. The main factor suppressing the population was annual mortality of calves from the exotic viral disease rinderpest. However, in 1963 the disease died out, probably as an indirect result of vaccination campaigns with the surrounding cattle herds. Released from the negative impact of the disease, the wildebeest population started to grow rapidly and by 1977 it had reached 1.4 million. Since then the population has fluctuated between 1.1 million and 1.4 million, though during a severe drought in 1993 it dropped to 0.9 million before recovering again in the following years. Modeling of the population has shown that in the absence of any off-take from poaching, the wildebeest population could grow as high as 1.6 million animals. However the current figures of approximately 1.2 million probably represent the carrying capacity for the ecosystem under the present rainfall regime. Below are the main conclusions of the paper:

- The migratory wildebeest population of Serengeti has been monitored for 40 years (1958 – 1998). The population increased from 1963 to 1977, stabilized from 1977 to 1993 and decline during drought in 1993 – 94. These changes provided a significant contrast in densities and the opportunity to determine the life history stages where survival was density dependent and their causes.

- There was a delay in age of maturity and a decline of both yearling and adult pregnancy rates at higher densities. Changes in yearling pregnancy had minimal effect on number of calves born. Adult pregnancy rate dropped from 95% to 88%

- The greatest absolute mortality occurred in newborn calves (0-4 months old). The most variable survival was in dry-season calf mortality (5 – 11 months old).

- Density dependence was clearly present in adult mortality and this appeared to be the regulating life stage. Density dependence was also found in dry-season calf mortality. The drop in pregnancy rate was only weakly density dependent.

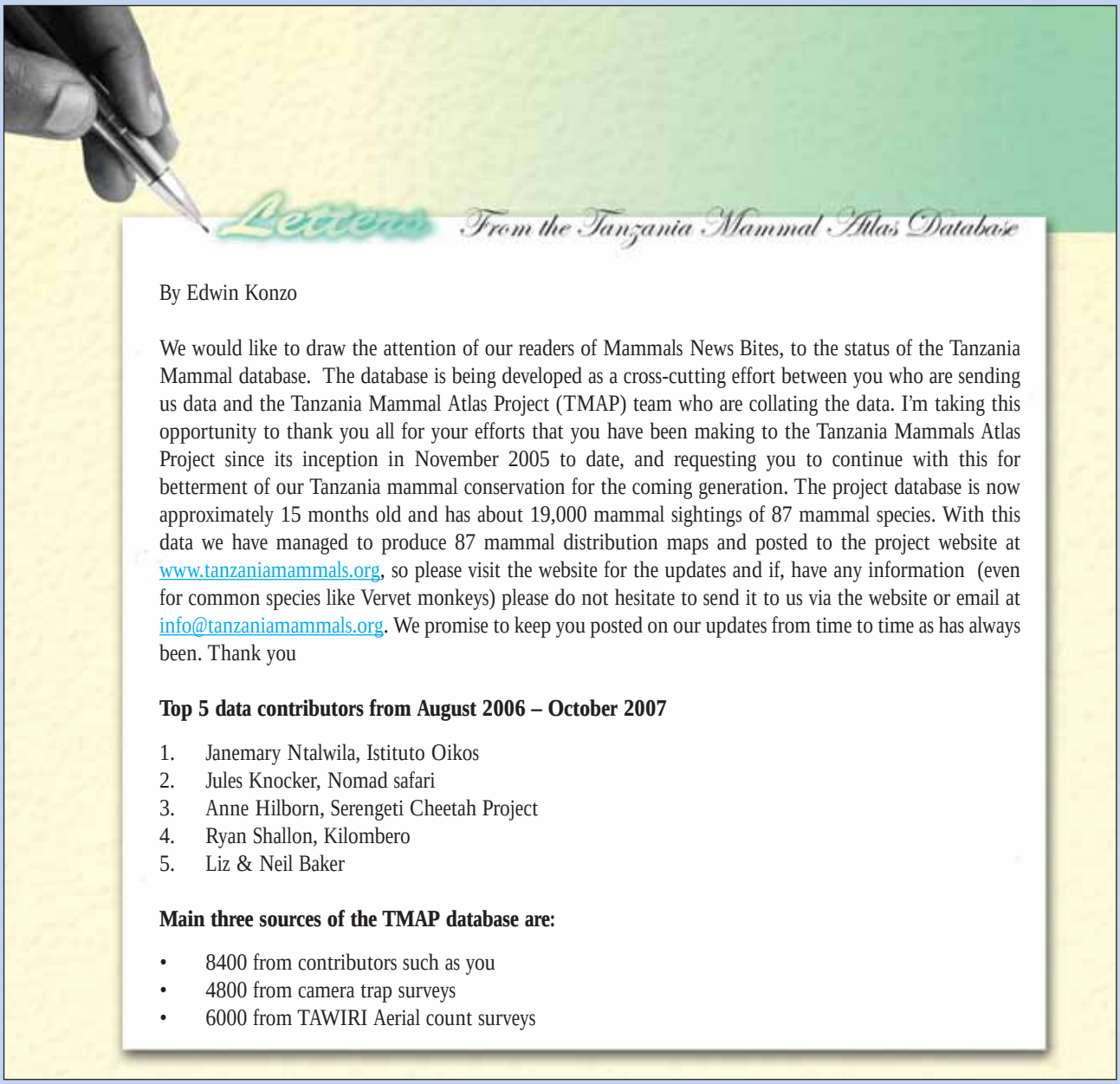
- The main cause of mortality (75% of cases) was under nutrition. Bone marrow condition showed that more animals died in extremely poor condition as the population increased and predation did not cause these deaths.

Population fluctuations in the Serengeti Migratory Wildebeest from page 7

- Predation played only a minor role in limiting the wildebeest population. Predators caught animals in moderated condition during the increase phase and increasingly condition during years of high population density. The main predators were lion and hyaena

- Rainfall was the most important extrinsic determinant of food supply for the wildebeest population but food was related to mortality only during dry season when population density was incorporated.

- The wildebeest population appears to be regulated by natural causes through food supply. Human – caused mortality appears to be a minor factor. However, if the number of wildebeest killed by humans increase as human population increases, then there could be a permanent decline in wildebeest and a major change in the whole ecosystem, because wildebeest are the keystone species. Continued monitoring is essential for conservation of the Serengeti ecosystem.



Letters *From the Tanzania Mammal Atlas Database*

By Edwin Konzo

We would like to draw the attention of our readers of Mammals News Bites, 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 collating the data. I'm taking this opportunity to thank you all for your efforts that you have been making to the Tanzania Mammals Atlas Project since its inception in November 2005 to date, and requesting you to continue with this for betterment of our Tanzania mammal conservation for the coming generation. The project database is now approximately 15 months old and has about 19,000 mammal sightings of 87 mammal species. With this data we have managed to produce 87 mammal distribution maps and posted to the project website at www.tanzaniamammals.org, so please visit the website for the updates and if, have any information (even for common species like Vervet monkeys) please do not hesitate to send it to us via the website or email at info@tanzaniamammals.org. We promise to keep you posted on our updates from time to time as has always been. Thank you

Top 5 data contributors from August 2006 – October 2007

1. Janemary Ntalwila, Istituto Oikos
2. Jules Knocker, Nomad safari
3. Anne Hilborn, Serengeti Cheetah Project
4. Ryan Shallon, Kilombero
5. Liz & Neil Baker

Main three sources of the TMAP database are:

- 8400 from contributors such as you
- 4800 from camera trap surveys
- 6000 from TAWIRI Aerial count surveys