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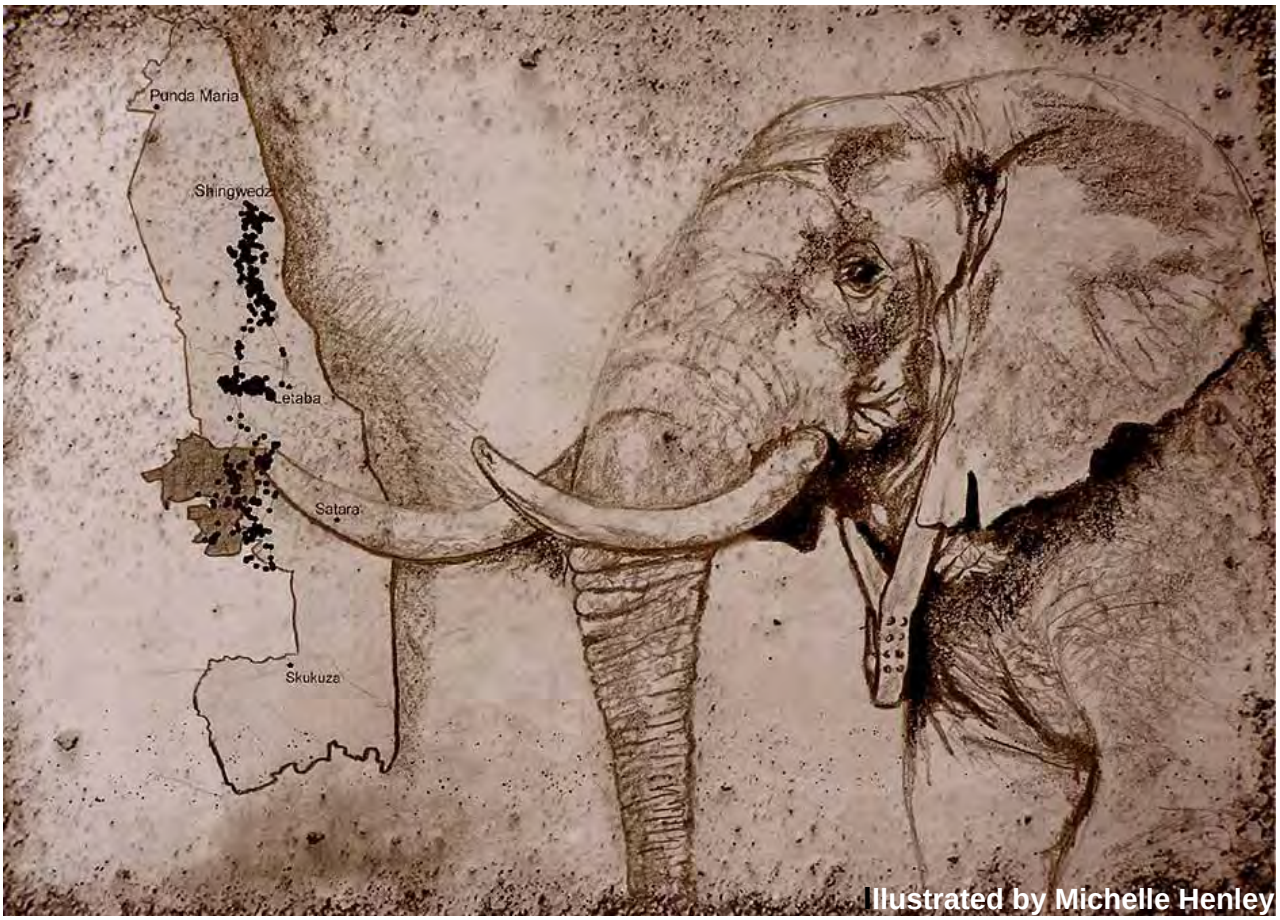
ELEPHANT NEWSLETTER

December 2012

by
Michelle Henley
email: michelephant@savetheelephants.co.za

In this issue we pay tribute to the older bulls, focussing on Mac and Classic. We provide some Sobering Statistics on Elephant Poaching and also highlight the Cross-Border Movements of Elephants into Zimbabwe amongst our usual inserts

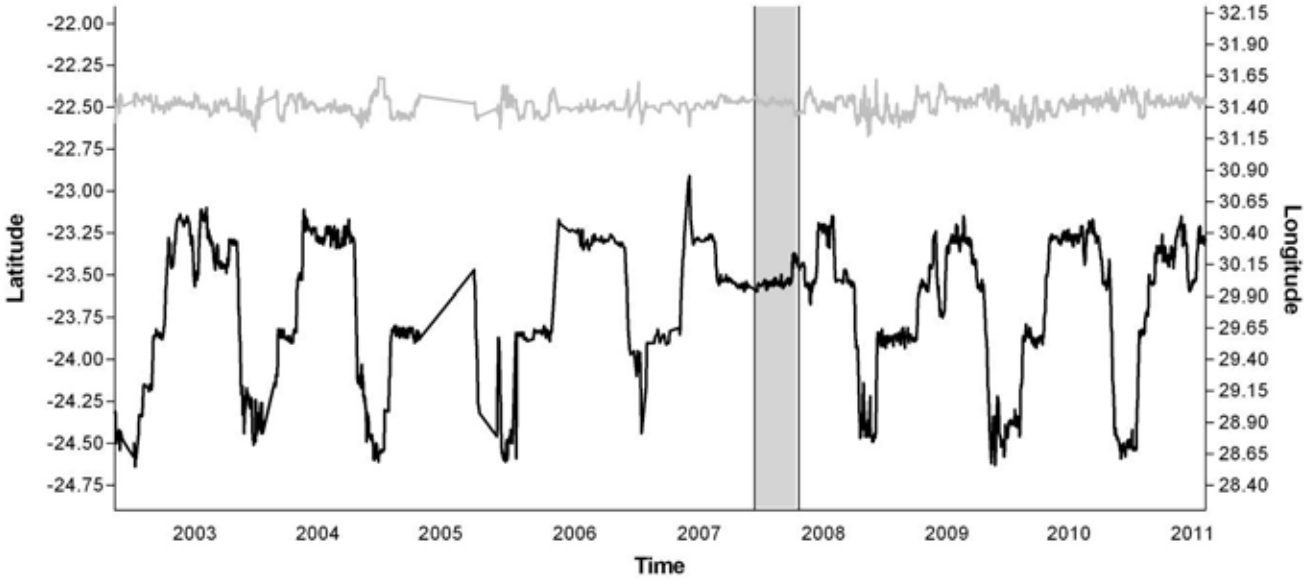
Celebrating Mac's 10th tracking anniversary



Illustrated by Michelle Henley

It was during Mac's musth period in May of 2002 that he was first collared as part of a Green Hunt. His first collar was sponsored by Tony McClellan, hence the origin of his name. For the past ten years we have had the rewarding experience of following Mac's annual musth journeys from the northern regions of the Kruger National Park (KNP) to the Associated Private Nature Reserves (APNR). What have we learnt over the past decade?

With remarkable consistency Mac has experienced annual musth cycles between April and July each year. His movements south when in musth and then north after dropping out of musth have led to temporal traces of movements marked by large changes in latitude with relatively small changes in longitude. Overall, the temporal trace of the past decade reads like the electrocardiogram (ECG) pattern of a healthy individual in his breeding prime! The only 'abnormal blip' in his usual routine is easily detectable in 2007 when he failed to come into musth because of a severe case of ulcerative pedodermatitis which limited his movements for more than four months (refer to the shaded area in the figure below).



We have watched with amazement how Mac's tusks have increased in size over time. Measurements of his tusks during collaring operations have indicated that Mac's tusks have increased in weight by at least 3 lbs per year per side. In August 2010, when we fitted Mac's latest collar, we had the opportunity to take a molar impression to estimate Mac's age and estimated him to be 55±4 years old. Although Mac can now be considered a fairly old gentleman, he again graced us with his presence this year when he came to visit the APNR in full musth. We have observed that initially when Mac first started visiting the APNR for his annual musth cycle, he kept his movements to the Timbavati and Umbabat Private Nature Reserves. Over time, he gradually started moving into the Klaserie Private Nature Reserve. During this year's musth cycle, he spent most of his time in the Klaserie (refer to the red tracks for his latest musth cycle in the figure below). We are left to wonder whether Mac has learnt to start using new potential breeding grounds over time. Did it take him a number of years to shake off his memory of where the fences separating the Klaserie from the Umbabat and Timbavati Private Nature Reserves were when he first started exploring these regions?

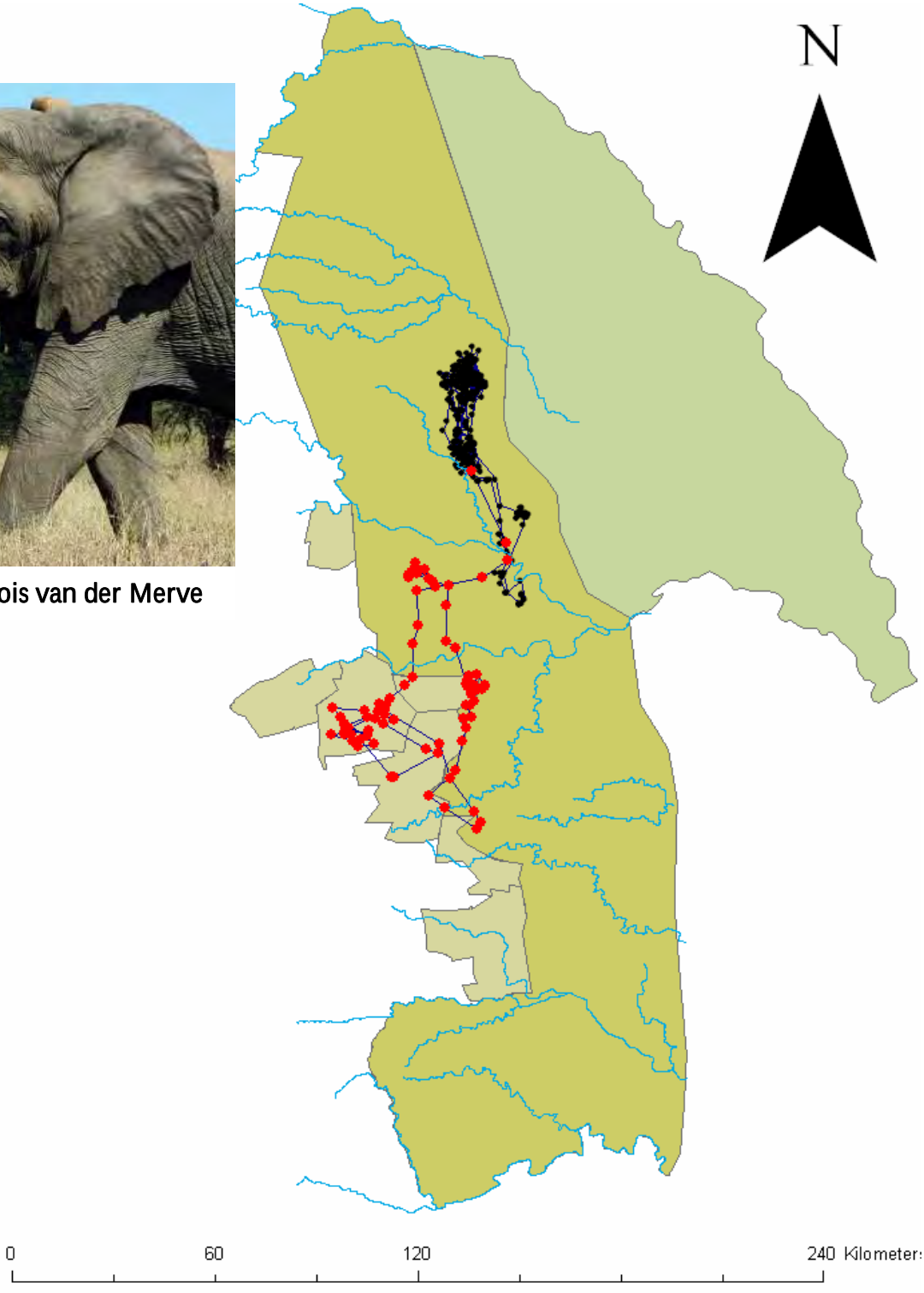
It has been rewarding to get glimpses into Mac's world, afforded to us by his collars. We are proud to announce that he is known as one of the longest and largest tusked, continually monitored elephants

in Africa today. Mac has rewritten the textbooks with his home range of over 7000km^2. He has provided us with insights into how bulls' tusks increase over time, how injuries and the loss of body condition can influence musth cycles and how breeding ranges can shift over time. Mac, we salute you for all that you have taught us. Thank you!

For interest

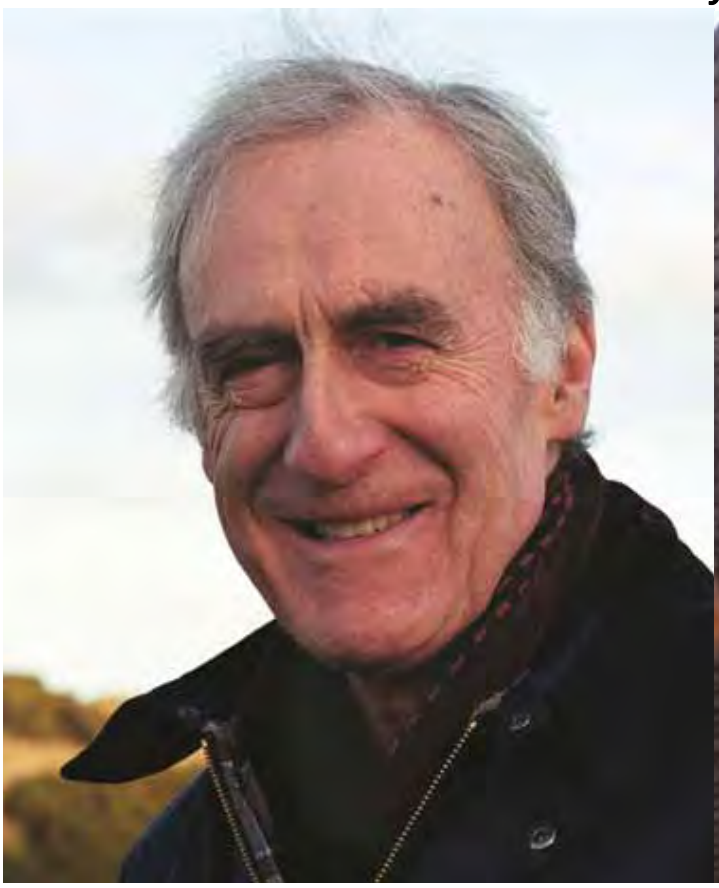
GANSWINDT, A., MÜNSCHER, S., HENLEY, M.D., PALME, R., THOMPSON, P. & BERTSCHINGER, H. 2010. Concentrations of faecal glucocorticoid metabolites in physically injured free-ranging African elephants (*Loxodonta africana*). *Wildlife Biology* 16: 323-332.

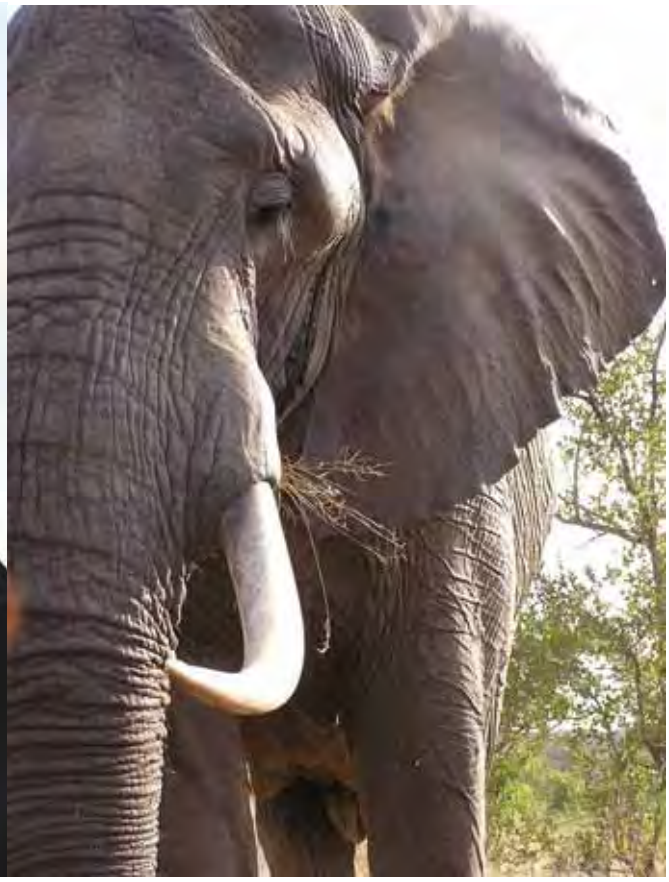
Photo: Francois van der Merve



Welcoming Wisdom -When the Wise meet the Wise

Narrative by
Prof. Aubrey Manning





Professor Emeritus: Aubrey Manning

- Born 1930s, London, England
- Chair of Natural History, University of Edinburgh until retirement
- Mentor to numerous students and presenter of various BBC productions, thereby promoting science as part of our culture
- Valued and respected for his contribution to science by receiving numerous academic accolades

Classic

- Born 1960s, Associated Private Nature Reserves, South Africa
- One of the top ranking males within the Reserves until retirement
- Mentor to numerous young bulls during non-musth cycles, thereby providing guidance in elephant behaviour and ecology
- Valued and respected for his aesthetic appeal, guidance of younger bulls and as gene carrier of large tusks

I have met Classic only once, although I have followed his progress in these reports ever since. A few years back I was lucky enough to be making a natural history programme about elephants with the BBC. The producer and I were out looking for elephants in general but Classic in particular because we wanted to talk about the lives of the mature bulls. The Researchers knew roughly where he might be and driving slowly along Timbavati trails we scanned for signals from his radio collar. Soon they came in strongly and we began searching by eye from the jeep. The loud bleep of the signal made me feel both excited and a little fearful – Classic must be close, but I could not see him. The dry, grey

bush seemed silent and empty but soon the experts found him and I realised why my eyes had failed thus far. I was looking far too low in amongst the dense understory but the elephant was outside this scale, up there with almost the top of the tree line. Classic is huge!

I am a zoologist and fairly familiar with modern research on elephants. I've had the privilege of going 'off road' with researchers in Amboseli in Kenya and been among the matriarchal groups there – but being with Classic was different on this morning. We were seeing him during his long months of travelling in his non-musth period. Maybe one or two younger bulls were serving their kind of 'apprenticeship' with him, but they would keep their distance. He was spectacularly alone to me – a great animal wandering free in South Africa as he had done for decades before and his ancestors for millennia before that. I enjoyed watching him forage in a leisurely way with that amazing delicacy of movement which these giants exhibit.

Classic's solitude brought home with special force the sense of his freedom. This is a freedom we should cherish - totally wild animals living their own lives, being themselves only, separate from us, needing nothing from us but to be left alone with space. It is becoming increasingly rare and with the love and awe I felt for this wonderful animal, there was inevitably anxiety. For elephants to continue will require human restraint and not just in Africa but in the rich North. For me this great bull elephant wandering alone in his world represents a symbol of how human future could be if we get into better balance with the natural world which supports us as well as all other living things. I cannot bear to think of a world which has no room for Classic.

Thank you

We are very grateful to the following people and organisations that have sponsored Mac and Classic's collars and collar service fees over the years. Without your continued support, it would not have been possible to follow these individuals in their day to day lives. In alphabetical order: Charlie Irish, John Hodges , Marlene McCay, Nelda Villines, Robert Mann, Tony McClellan, the US Fish and Wildlife Services and the Wildlife and Environmental Society of South Africa. Thank you to Dr. Cobus Raath (Wildlifevets.com) and Dr. Markus Hofmeyr (SANParks) for their professional veterinarian services during collaring operations. Ben Osmers and Grant Knight are thanked for their expert flying during collaring operations.

Why is Age Important in Elephant Society?

At birth the weight of the brain of an elephant is 35% of the adult weight which is more comparable to the 26% in man than the 90% of the adult weight in most other mammals (Spinage 1994). Hence elephants and humans both share a prolonged period of learning and flexibility in behaviour as they slowly develop into adulthood. Elephants' brains have a relatively large hippocampus compared to primates which may explain their long social and chemical memories (Hakeem et al. 2005). Dealing with a large-brained, long-lived and highly social species that can accumulate knowledge over a life-span enables knowledge to be passed on from one individual to another and can subsequently be retained for a number of generations. We now know that the oldest individuals in a group have enhanced social discrimination and consequently function as important repositories of social and ecological knowledge (McComb et al. 2001, Evans & Harris 2008; Foley et al. 2008; McComb et al. 2011). Longevity is obviously a key attribute selected for in the evolutionary ecology of elephants and is closely linked to their adaptive fitness.

Older females assist in the birth and rearing of calves (Moss 1988). At more than 50 years of age, there is a decline in the reproductive output of female elephants. However, females of this age are most likely to be the matriarch. These infertile grandmothers impart energetic benefits to the herd by direct care of kin which enables mothers to wean their offspring sooner and reproduce again. Hence the higher reproductive rates of kin could impart fitness benefits that promote cessation of reproduction in the grandmothers (Freeman et al. 2008). As older matriarchs have the ability to lead their families outside of their usual range, family units with older females tend to have higher calf survival rates during drought years compared to those led by younger matriarchs (Foley et al. 2008). Mutinda et al. (2011) found that individuals of 60 years and older, had the greatest success at leading large-scaled movements. It has also been found that elephant family units benefit from the accumulated knowledge of older leaders which have an advanced ability to make crucial decisions regarding potential predatory threats (McComb et al. 2011). In general, elephants have already demonstrated that they can distinguish human ethnic groups that pose different levels of threat based on olfactory and visual cues (Bates et al 2007). As with males, older females are usually targeted first during poaching events. Even after 15 years, remnant family members subjected to poaching experienced impaired social functioning, elevated physiological stress (as indicated by faecal glucocorticoid levels) and reduced reproductive output (Gobush et al. 2008).

Older elephant bulls play a pivotal role in bachelor society. As with females, even post-prime bulls are still important socially. Adolescent bulls not only prefer larger social groupings but also prefer being

closer to older bulls in particular. Bulls of all ages have been found to prefer bulls older than 36 as their nearest neighbour. These more experienced individuals often lead younger bulls to explore new areas and access scarce resources (Evans & Harris 2008). Older bulls had high centrality within social groupings which is indicative of leadership and their importance as sources of information to con-specifics (Chiyo et al. 2011). In addition, male reproductive dominance is determined by age, size and musth. Females preferentially mate with older more experienced males that often guard them during their oestrus cycle (Poole 1982, Poole 1997). As elephant bulls grow throughout their life and older bulls have the longest musth periods (Poole 1989a, b), it follows that older bulls have elevated paternity success when compared to younger males. The number of calves fathered at a given age, increased from the mid-20s until it peaked between 45 and 53 years of age (Hollister-Smith et al. 2007). In the past, bulls over 50 years of age were considered redundant (Hanks 1979) but more recent studies have found that bulls do not reach their sexual prime until they are over 45 years old (Poole 1997; Hollister-Smith 2005, Rasmussen 2005). These findings indicate that sexual selection has perpetuated indiscriminate growth, delayed competitive breeding and contributed to selection for longevity in elephant bulls (Rasmussen et al. 2008). Older bulls are also of social importance with regards to suppressing musth in younger bulls and thereby maintaining social stability within the population (Slotow et al. 2000, Slotow et al. 2001, Slotow & van Dyk 2001).

An elephant's tusks grow throughout their life (Pilgram & Western 1986) and in male elephants, tusk weight gain increases exponentially with age (Laws 1966). Younger elephant bulls' tusks increase in weight at 2g per day i.e 730g per year. In older bulls, as the tusk pulp cavity fills, the increase in weight accelerates towards the end of the bull's life (Spinage 1994). Therefore, trophy hunting and poaching of elephants is often biased towards the largest, oldest bulls within a population. Tusk size is sexually dimorphic, and presumably large tusks give a bull a competitive advantage when establishing their social status amongst other bulls and it could also act as a sexual signal to females that a particular individual is physically fit and dominant despite having to carry a physical hindrance around whilst feeding and moving. Sadly, large tusked bulls are under-represented in most African elephant populations (Douglas-Hamilton 1997). This is the legacy of a history of uncontrolled hunting and poaching on this continent. Although, trophy hunting is now regulated in a few countries it still continues to focus on the few large tusked individuals remaining in the population. Behaviourally the selective offtake of older bulls could cause younger bulls to start musth cycles earlier with the consequential harassment of breeding females (Rasmussen et al. 2008). The group cohesion of bachelor groups could be negatively affected by the removal of these 'mentors' (Chiyo 2011). There is a building body of evidence that suggests that when the social hierarchy of males is disrupted that tree pushing increases. This results in a situation where fewer elephants have more of an impact on large trees (B. Page pers comm.). Genetically, there is concern that long-term selective off takes will ultimately depress the quality of trophies (Stalmans et al. 2002), erode fine-scaled genetic structure (Archie et al. 2008) and lead to increased reproductive skew, which may increase the rate at which genetic diversity is lost from natural elephant populations (Archie et al. 2011). With escalating reports on the illegal trade in ivory, we need to safeguard the remaining older bulls. Large tusked individuals should be protected as icons of sound conservation practices as they are expected to become scarcer in future.

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Quote:

It is my conviction that an improved public understanding of science in general, not only implies better communication of the findings of science – important as this is - but a true appreciation of science as part of our ***culture***; i.e. recognition that the human processes of scientific endeavour involve the same intellectual and emotional activities as those of music, literature and painting.

Audrey Manning

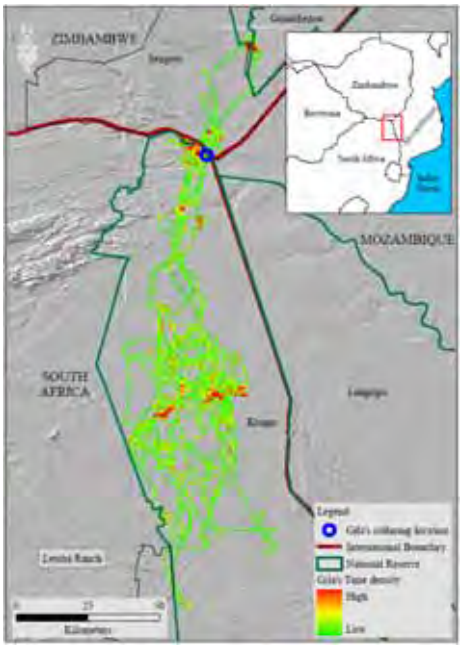
The illegal ivory trade: Some Sobering Statistics

- There has been a 45% decline in elephant range over 28 years, with at least 70% of their remaining range falling outside of protected areas.
- Between 1979 and 1989, 691 000 elephants died in Africa due to ivory poaching, a decline from an estimated 1.3 million to 609 000 in the space of 10 years.
- Based on a 10% seizure rate for ivory, 38 000 elephants were being poached in 2006 alone with reports of more intensified poaching in some regions since then.
- The current estimated annual off-take of 8% of the continental elephant population due to poaching represents a mortality rate higher than elephants' maximum annual reproductive rate of 6%.
- The present continental decline of elephants exceeds the 7.4 % annual off-take over the 10 years prior to the 1989 ivory ban so we can continue to expect a continental downward spiral of elephant numbers.
- The African elephant used to occur in 37 Sub-Saharan countries prior to the ban. They now occur in 36 countries as Sierra Leone lost all its elephants in November 2009.
- West Africa and Central Africa have been particularly hard hit by the ivory trade:
    - At present elephants in West Africa are distributed in 70 isolated populations covering less than 5% of the region. One third of these populations contain fewer than 200 animals, the number of elephants deemed necessary to ensure their continued survival in isolated pockets.
    - All central African counties have declining elephant numbers. Central African Republic has experienced a 90% decline in elephants in the past 30 years.
- Southern African elephants have increased in number since the ivory ban was instated (1989) so that elephants in these regions now make up more than 50% of the continental total compared to only 21% of the total elephant population more than 20 years ago. This bears testimony to fact that the rest of Africa's elephants are being decimated by unregulated domestic ivory markets as over the same time period West-, East- and Central Africa's elephants used to form close to 70% of the continental total but now only make up less than half of Africa's elephant population.
- South Africa, as one of the southern countries with increasing elephant populations is by no means secure. Ivory prices have increased by more than a 100% in the last three years with the emerging middleclass Chinese market and since the 2007 once-off sale of stockpiled ivory by Botswana, Namibia, Zimbabwe and South Africa.
- South Africa's Standard Bank has forecast that investment from China in Africa could reach $50 billion by 2015 which would be up 70% from 2009. As China expands its pressure in Africa through investments and infrastructure in remote areas, finding less and less wildlife resources to utilise in already denuded African countries to the north, the current wave of ivory poaching is bound to move southwards.
- We are vulnerable. Rhino, elephant and lion co-exist in our protected areas as targeted species for expanding Asian markets. Unemployment is high and non-poaching wages are low in South Africa. We are witnessing the effects of the demand for rhino horn with over 600 rhino poached in South Africa in this year alone. As rhino horn becomes scarce ivory poaching is predicted to pick up in our region, following the waves of poaching presently experienced to the north.

To keep up to date with news on the poaching of elephants, please visit:

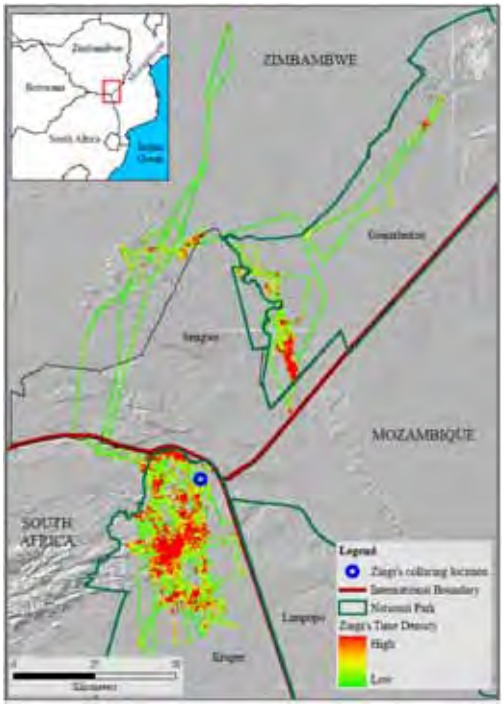
www.elephantsinperil.org

‘Peace’ Parks versus ‘Piece’ Parks



The metapopulation concept, linking protected areas, allows occasional movement between discrete populations to contribute to genetic vigour, ecological viability and long-term survival. The Peace Parks initiative linked the Limpopo National Park (LNP) in Mozambique, to the Kruger National Park (KNP) through the Great Limpopo Transfrontier Park (GLTP), increasing the area under conservation by 50%. It is intended that Gonarezhou in Zimbabwe should be included. We have tracked 12 elephants from the Makuleke Concession, in the far north of KNP since 2008. For the first time we have mapped elephant movements from Kruger to Gonarezhou, through and outside the proposed Sengwe Corridor, a straight line distance of approximately 40km. Two of our study animals made this journey. Gila, a mature bull largely circumvented the proposed corridor in a month long journey to reach Gonarezhou in mid-2010. Zingi, a mature cow, first made a two month journey into Zimbabwe at the beginning of February 2011 into unprotected areas. On Christmas Eve she embarked on a remarkable trek to Gonarezhou arriving circuitously from the north in order to avoid the Malapati Game Reserve where hunting is permitted, and exiting eight months later. She returned to the KNP overnight via the safer Sengwe corridor for the first time. Our tracking data has shown the Concession area is important for providing key resources and safety. Our northern study, although only five years in the running compared to the 10 years of research we have been conducting throughout GLTP, calls for the continuation of these tracking initiatives in collaboration with all stakeholders within the Peace Parks vision.

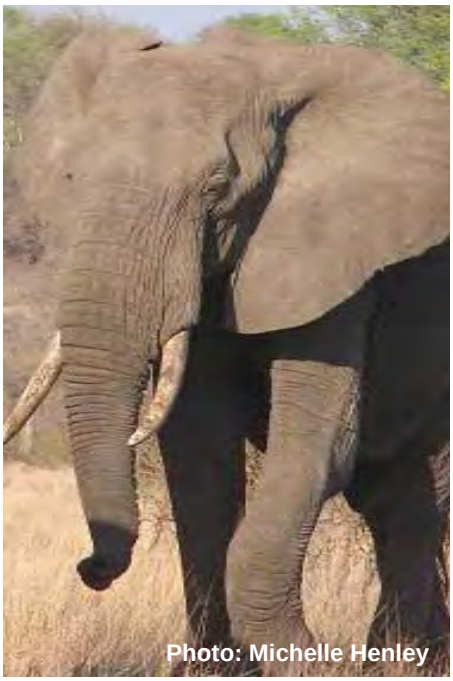
Here we would like to thank the US Fish and Wildlife Services for their continued financial support of our northern project. Wilderness Safari Trust is thanked for providing collars, accommodation and logistical support. Pafuri Camps, their managers and guides in particular, are thanked for their hospitality and assistance with collecting elephant identification photos. We would like to thank Chris Pearson from Wildcon Safaris and Events and South African Breweries for paying for collars and collaring operational costs. The University of South Africa and the Wildlife and Environmental Society of South Africa have also kindly contributed collars to the project. Sandra Visagie (Section Ranger, SANParks) and her team have made working up north both a privilege and a pleasure. The collaring operations were conducted under the expert guidance of Dr. Markus Hofmeyr (Head Veterinarian, SANParks) and Grant Knight (Chief Pilot, SANParks)



WHO'S-WHO……?

This regular feature will serve as an introduction to individual elephants. Here we feature a bull named Ezulwini who was recently seen on Addger in the Timbavati Private Nature Reserve.

Ezulwini, was first sighted in November 2003 in the Timbavati Private Nature Reserve. He was again sighted in this reserve in 2005 and 2007 but then started shifting his range westward. Towards the end of 2007 he was sighted in Klaserie Private Nature Reserve. During these early years, we had named him 'Introduce' only to find out that he had been frequently sighted within the Balule Private Nature Reserve from 2007 onwards. Here he became known as 'Ezulwini', the Zulu term for 'from heaven'. He has become well known in Balule, representing the largest tusked bull regularly seen within this region. As we would like to keep track of Ezulwini's musth cycles and movements, please report any sightings of this bull and send us photographs where possible for our records.



'Introduce' in 2003 in his early twenties

Ezulwini in 2012 in his early thirties

FACT-FILE: Info on Ivory *

- The following animals all sport **ivory**: extant (African and Asian) and extinct (Mammoths and Mastodons) elephants, walruses, killer and sperm whales, narwhals, hippopotamuses and warthogs.
- Schreger lines are visual artifacts that are evident in the cross-sections of **ivory**. This pattern, which is unique to ivory, is known as 'the mathematical daisy' for it is the same as that produced by florets of a daisy from fundamental mathematical rules. It affords **ivory** it elastic properties which are important to resist fracturing as tusks are subjected to leverage stress.
- In extinct elephant **ivory** the cross-over angle of the Schreger lines is consistently less than 90° whereas for modern elephants the angle is greater than 110°. This makes extant **ivory** more elastic and permits fossil ivory to be easily distinguished from present day **ivory**.
- Mammoth **ivory** is often flecked with brownish or blue green blemishes caused by vivianite, an iron phosphate. These blemishes are uniquely florescent under ultraviolet light. Extant elephant **ivory** will not naturally display this discolouration.

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News Flashes

- **TURNING OVER A NEW LEAF**

We will be forming part of the Lion and Elephant Africa Foundataion (LEAF) in the coming year and conduct our research under the 'Elephants Alive' banner, in collaboration with Save the Elephants, so keep in touch to share these exciting changes.

- **KEEP IN TOUCH**

We are now on face book! Please become a fan by searching for Save the Elephants – South Africa's Fan page http://www.facebook.com

Follow us on Twitter for daily updates http://www.twitter.com/STE_SA

- **FUNDING PARTNERSHIPS**

We are very grateful to all the landowners and interested parties that have submitted photographs and made financial contributions towards the project. A comprehensive list of all contributors will be periodically updated on our website. Please visit www.savetheelephants.org, navigate to 'Regions' then go to 'South Africa'

We are **PLEASED** to announce that online donations can soon be made by clicking on our '**DONATE**' button!

www.savetheelephants.org/south-africa-donatenow.html

An EFT transfer of funds can also be made to: Save the Elephants – South Africa (STE-SA), Account number: 331632284. Standard Bank. Hoedspruit branch Code 0572752, Swift code SBZAZAJJ, NPO number: 055-871-NPO, PBO number: 930030852

We wish you a wonderful festive season filled with the warmth of friends and family