SAVE THE ELEPHANTS

ELEPHANT RESEARCH

–A·P·N·R–

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In addition to the regular features, this issue will focus on collaring elephants for research purposes.

COLLARING ELEPHANTS

Collaring Classic and Diney

In the week leading up to the scheduled Green Hunt, Steve Henley and I were following Classic on a daily basis in the vicinity of Mbali where he was associating with a large breeding herd. Three days before the hunt we found him walking down the Vielmeter-Alberts cutline. He was heading westward, towards Klaserie. On Wednesday the 19th of May, the day of the hunt, we set out to find Classic with the help of Bruce McDonald in his microlite. The search was joined by a helicopter, and for a while we went on a wild goose chase after having been mistakenly informed that Classic had been sited near Mbali. Various breeding herds were sighted from the helicopter, but Classic was nowhere to be found.

In the meantime it was decided to place one of the satellite collars on a breeding herd known to us as the 'flower-herd' - the adult females within this family unit having all been given names of flowers. A satellite collar was placed on a lactating cow with characteristic tusks. Her right tusk turns sharply upward while her left tusk is straight and points down. Tony McClellan, who donated Mac's collar had also kindly donated the collars which were fitted to the cow and which would also be fitted to Classic. As requested by Tony, the darted cow was called Diney, in honour of a great friend.

At the time of the darting Diney was part of a group of 11 elephants and it was suggested that she may have twins. From our previous observations we knew of another cow, Forget-me-not, who had formed a close association with Diney and who had a calf of similar age; we had not, however, observed twins whilst studying this herd, and were thrilled at the prospect. After the collaring operation we made a specific effort to locate Diney for a couple of days to ensure that she

had been safely reunited with her family and to check whether in fact she had twins. The 'Flowers' had settled down after their temporary ordeal, and although Diney's calf stuck close to her side, the only other calf of similar age kept close to Forget-me-not.

After successfully completing Diney's collaring operation the search was resumed to find Classic. In spite of an elephant's large size, looking for a specific animal in the APNR can be like looking for a needle in a haystack. Just as Steve and I were becoming disheartened, Theresa McDonald called me on the radio to notify us that Bruce had seen Classic at Senalala in the Klaserie. The helicopter raced in hot pursuit 10km west from where we were with the ground team. Sure enough, there he stood in all his magnificence. The Green Hunter, Charlie Irish, took to the air with Douw Grobler, the veterinarian, and after darting Classic we waited approximately 10 minutes for the large bull to go down. After photographing Charlie and the sleeping giant, morphometric measurements and blood samples were taken for research purposes, and the satellite collar was fitted. The antidote was then administered to the newly named Classic Charlie. After getting to his feet and orientating himself, Classic Charlie turned his back on the silent, awestruck audience and slowly walked off to resume his daily activities.

CLASSIC CHARLIE'S MEASUREMENTS

SHOULDER HEIGHT:		3.43 m
TUSKS:	left	142 cm, (length), 43cm (circumference), 78.8 pounds (weight)
	Right	148 cm (length), 45cm (circumference), 86.0 pounds (weight)

Steve and I waited for everybody to leave the site of the collaring. We then went to sit on the bent grass were Classic Charlie had lain snoring only minutes before. Waiting silently for the sounds of birds to once again fill the air, we inhaled the musky smell of elephant. The moment filled us with a great sense of awe and gratitude; we were thankful to all the people that had given of their money, their time and their skills to make the operation possible, but mostly, we were left with a deep sense of gratitude and respect towards these elephants who would now become such an intimate part of our lives. We would now follow in the tracks of not only Mac, but Classic Charlie and Diney as well…….

Quote

Science is built up with facts, as a house is with stones.
But a collection of facts is no more a science than a heap of stones is a house.
–Jules Henri Poincaré (French scientist 1854-1912)

Firstly we would like to thank Tony McClellan for sponsoring Mac, Classic and Diney's collars. Charlie Irish is thanked for not only conducting the Green Hunt on Classic but for also generously donating three digital cameras and two handheld computers towards the project. Robert Mann is thanked for conducting the Green Hunt on Mac in May 2002.
A very special word of thanks to Bruce and Theresa McDonald who tirelessly assisted in the search for Classic. Bruce, we really appreciate your enthusiasm and 'wings'.
The lodge rangers of Tanda Tula, Kings Camp, Gomo Gomo and Motswari are also thanked for their interest and reporting sightings of Classic.
The following people are thanked for their active participation in the collaring process: Scott Ronaldson, Paul White and the Timbavati field rangers, Colin Rowles and the Klaserie field rangers, Douw Grobler and JJ van Altena as the veterinarian team, Jacques and Piet Goosen as the film crew.
Logistic support was given by Save The Elephants, David and Marlene McCay, Giles King and the Tanda Tula staff.

Why collar elephants?

In this study we hope to be fitting another 17 bulls with satellite collars and another 11 cows from different family units. Using a combination of direct observation and satellite tracking technology, we aim to identify patterns in elephant movements and understand what environmental factors (e.g. habitat conditions, social interactions, and safety benefits) are responsible for the observed spatial patterns. The question may be asked - if we can collect data simply by observing the elephants is it necessary to put on collars?

Effective wildlife conservation is in part dependent on reliable, scientifically sound information. This means collecting sufficient accurate data at relevant scales of space and time. The elephant identification study allows us to recognise known individuals, where they are, their condition and who they associate with. Unfortunately the method requires people on the ground to observe elephants, and to do so sensitively enough that they are not influencing the animal's behaviour. It could be argued that a distribution map derived from the elephant identification database is as much a reflection of where the observers were as it is of were the elephants occurred. No elephants would be recorded where there are no observers. Hence the need for satellite collars - to fill in the gaps. The satellite collars will enable us to relate the distribution data derived from observations of elephants to an unbiased plot of their entire range. Furthermore, the satellite collars will provide accurate data (to within 10 m) at regular intervals (at least three time a day). If we are serious then about understanding where elephants move within the APNR - Greater Limpopo Transfrontier complex, satellite collars are essential for the collection of sufficient accurate data at the relevant spatial and temporal scale. The interpretation of these data will be enhanced with the additional data collected through resightings of known elephants over the same time period. The two techniques complement one another and are not substitutes.

While there may be no arguing the scientific merits of collaring elephants, the question remains what is the impact of these collars on the elephants of the APNR? Biotelemetry, or

radio tracking, has been an important tool of wildlife researchers and managers since the mid-1960's. Experience and research have provided us with the rule of thumb: collars weighing less than 10% of the body mass of the study animal can be expected to have no perceptible effect on the behaviour or locomotor abilities of that animal (Koehler *et al.* 1987). Even for an animal the size of an insectivorous bat, with its high metabolic demands, a transmitter weighing 5% of the body mass does not influence flying behaviour (Aldridge & Brigham 1988). It should be remembered that a pregnant female bat weighs 30% more than a non-pregnant female, and in this condition must be able to cope with the increased metabolic demands associated with developing foetuses. Larger-bodied bats can carry a proportionally greater mass without apparent negative effects. The effect of transmitter weight on the behaviour and survival of large mammals, such as antelope and elephants appears to be of even less concern (White & Garrott 1990). For example, it has been found that radio collars did not influence the behaviour of red deer (Berger *et al.* 1997), or influence predation rates amongst mule deer fawns (Garrott, Bartmann & White 1985). The satellite collars being fitted to elephants within the APNR weigh approximately 13 kg. This is 0.5% of the body mass of a small adult cow (*ca.* 2 500 kg). Furthermore, the collars in no way interfere with cryptic coloration or thermoregulatory behaviour of the elephants.

It is obvious then that the effect of collars will be negligible to the individual elephants. The collaring operation itself, which involves anaesthetising the study animal, may influence the behaviour of that animal in the short-term. However, research has shown that within a few days the behaviour of the study animal returns to normal (White & Garrott 1990). Our observations of Mac, Classic and Diney only corroborate these results. When we located Diney the day after she had been collared, we found she was with her herd, and although we did not pursue her for an extended period we were confident that she had reunited with her calf. This was confirmed within a few days. The effect of collaring may be less intrusive than ongoing game viewing associated with ecotourism.

Finally the question may be raised: what effect will the telemetry study have on the elephant population as a whole and wilderness experience of landowners and visitors to the APNR?

This project plans to fit a total of 30 collars to individual elephants over the next three years. The annual game count of 2003 estimated the elephant population within the APNR to be approximately 750 at that point in time. Bearing in mind that animals are constantly moving between the APNR and the KNP, the actual number of elephants moving through the private nature reserves during the course of one year will be higher, how much higher we will only know once sufficient data are available from this study. Nonetheless, 30 collared individuals in a population of 750 represent less than 4% of the population. The astute elephant observer has a similar probability (*ca* 3%) of seeing an elephant with a collapsed ("floppy") ear as one with a collar. When they are fitted, the collars are coloured an elephant grey, and over time they become stained by the mud and dust layered on them by elephants during the normal course of their lives; much like the skin of the elephants.

While there has been a moderate amount of research that has been undertaken on the movements of cows in the KNP (Whyte 2001), our understanding of the movements of bulls is limited. Although the APNR is utilised by elephant from adjacent reserves very little demographic information is currently available on the APNR's elephant population. After two years use of the satellite tracking technology we have established that the total area traversed by Mac represents 4 540 km^2. These results differ considerably from previous estimates of home range size for bulls within the Klaserie- and Timbavati Private Nature Reserves (REF). Conventional radio telemetry methods used on bulls within the APNR estimated a mean home range surface area of 238 km^2 (De Villiers 1994). These preliminary results suggest that the home range size of mature bulls is dependent on reproductive activity, and clearly distinguishes between home ranges occupied during musth and non-musth periods. As a sample size of one is insufficient to derive any conclusion, we will need to collar enough study animals to account for individual variability in range behaviour.

Determining habitat usage patterns in combination with terrain and vegetative characteristics will improve our understanding of the range requirements of elephants (Douglas-Hamilton 1998). Combining site-based data on vegetation impact with the movement of elephants across the landscape would thus make an important contribution towards management. By using collared study animals we aim to provide important data to managers within the APNR while answering many research questions concerning the behavioural ecology of elephants. Insights into patterns of dispersal as a population regulatory process can be incorporated into operational guidelines for decision-makers within the greater conservation area.

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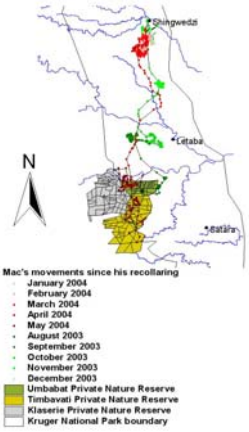
Where are the collared elephants?

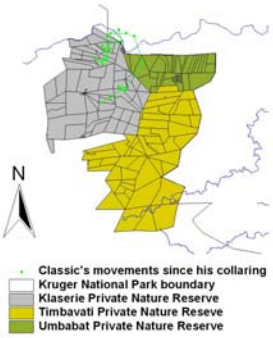
Mac moved south after entering the APNR in the beginning of May and is at present on Vlakgezicht in the Timbavati.


Photo Michelle Greyling



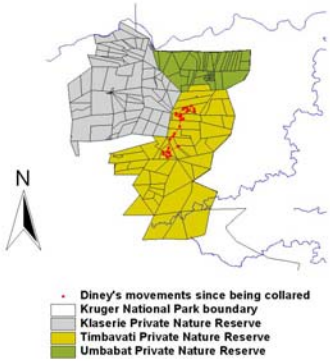
Classic moved north after being collared on Senalala and is presently on Dundee in the Klaserie.


Photo Michelle Greyling



Diney moved south after being collared and is currently on Jouberts Hoop.


Photo Michelle Greyling



WHO'S-WHO……?

This regular feature will serve as an introduction to individual elephants with which we have become familiar in the APNR. Here we focus on an elephant named Numzane…

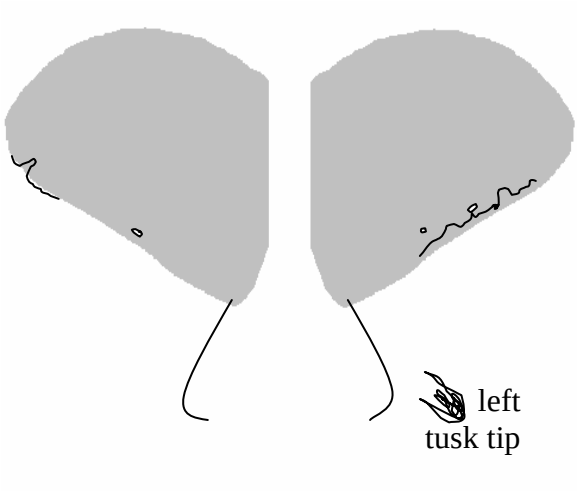


Photo Michelle Greyling (Timbavati)

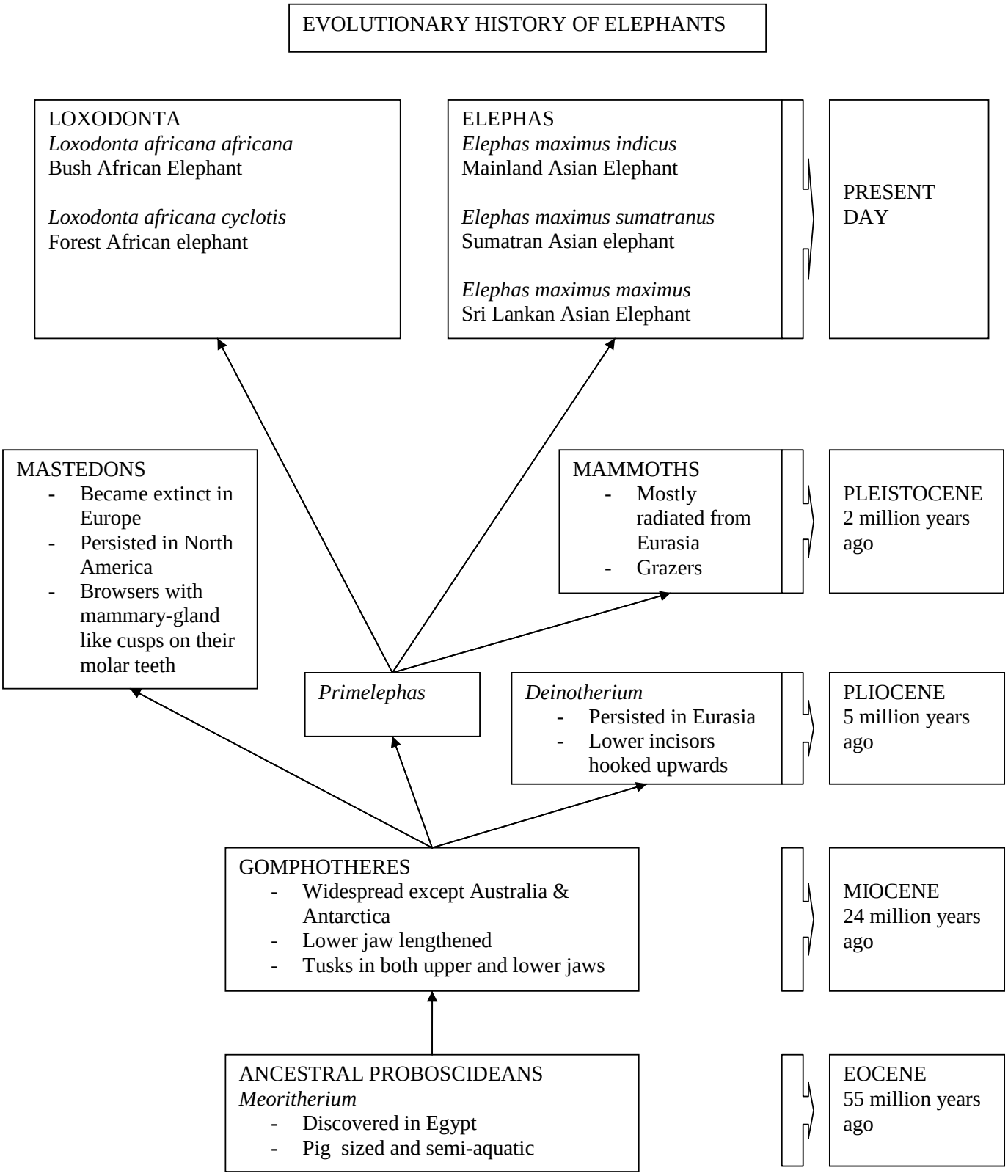
We first sighted umNumzana shortly before Christmas. He was in full musth and was purposefully striding towards Marco's dam on Umlani. Since then Dale Jackson took photos of him following a breeding herd towards the end of December as well as on New Year's Day. When we caught up to him again three times in March he was still in full musth. He was last sighted on the 12th of March. As he was in the vicinity of Classic when we were keeping track of Classic's movements, the casual observer could confuse him with Classic because of his symmetrical and impressive tusks.

His long musth cycle of approximately four months indicates that he is an old, mature bull. umNumzana's tusks appear to be as thick as those of Mac but are shorter than those of Mac as well as Classic. He has holes in both his left and right ears and his ears are wavy, unlike those of Classic. The tip of his left tusk is chipped. He has a placid nature even while in musth.

umNumzana, meaning "sir" in Zulu, would be our next suitable candidate for a Green Hunt, As I would like to keep track of his movements I would appreciate it if you could report any sightings of him to the research office.

FACT-FILE: Elephant Evolution

I here present a flow diagram to explain the origin of present day elephants. Start at the bottom and work your way up. To the right the periods are given while the left presents the type of developments that took place.



SPECIAL REQUESTS

We will be unable to meet the objectives of this study without your input and support. I therefore have the following requests and appeals to make…

VEGETATION:

We are looking for opportunities to test various techniques for protecting individual trees from elephant damage (*i.e.* bark stripping and uprooting). To do this we need to find areas where elephants regularly damage large trees, where there are sufficient undamaged trees of the same species, similar size and vulnerability to which we can apply various treatments (e.g. pack stones around the base or cover the trunk with chicken wire) and a control (*i.e.* an untreated tree that serves as a benchmark against which we can compare the effect of treatments). We will then monitor the trees over time and record the extent to which treatments protect trees relative to unprotected trees. If, as a landowner, you are aware of such a place on your property and you would be prepared to contribute labour (± 2 days) and materials (stones, chicken wire, nails etc.) please contact Steve or Michelle at the Elephant Research Centre. Alternatively, if you would like to make a contribution to this study (financial or material) or find out more about it – give us a call. Research work done previously by Michelle suggests that the impact of elephants upon trees is greatest in the dry season, and as such we would like to get this monitoring programme initiated within the next two months.

ELEPHANT IDENTIFICATION KIT:

If you are keen to assist in the collection of elephant ear patterns or if you have taken any elephant photos and would like to make these available, I would be most appreciative. Please contact me so that we can make an arrangement. If you are interested in ordering an identification kit, email me as soon as possible.

NEWSLETTER:

If you would like to contribute to the newsletter in any way, please do not hesitate to contact me, especially if you have come to know specific elephants over the years and have some interesting stories to tell.

ELEPHANT MORTALITIES:

Any reports of elephant mortalities within the APNR, either recent or historic, would be appreciated. Ideally we would like to record the date, location, age and sex, and cause of death. However, any data would be welcomed.

DONATIONS AND SPONSORSHIPS:

We would like to thank the following landowners for making financial contributions towards the project: Joe Brady, Stefan Bruer and Peter Smelting. Gordon and Mary Jones, Margery Ord and Malcolm Yorston kindly made donations while visiting the research office. As this costly project is dependent on donations any financial contributions can be made to the 'Elephant Research APNR', account number 033356165, Standard Bank, Hoedspruit, Branch Code 052752. All contributors will be acknowledged in forthcoming popular and scientific publications.

OUR NEXT NEWSLETTER…….

*In the next issue of **Elephant News** we will discuss close encounters with elephants.*