



## Science & Survival

### *Overview of Elephants Alive's current research within APNR*

#### **Background Information.**

For more than twenty years, Elephants Alive has been studying the elephants across the Great Limpopo Transfrontier Conservation Area. We have developed an identification database of over 2000 individual elephants and have collared 96 elephants since 1998. This long-term research is providing fundamental information for elephant management and protection; informing conservation bodies and private landowners on seasonal movements, sustainability of trophy hunting, impact on vegetation— and is now also identifying poaching hotspots.

In keeping with our mission and the need for intact habitat, we also monitor approximately than 3500 large trees known as favoured food species by elephants. This includes trees with ground hornbills and vulture nests to study the long-term effects of elephants on the nesting sites of these endangered species. We also monitor trees in areas prior to their exposure to elephant impact to determine how the accumulative impact of elephants affects tree survival rates over time.

As well as our field research, it is Elephant Alive's belief that to ensure the long-term preservation of free-ranging elephants, it is critical to empower, inform and involve local impoverished communities. We foster linkages with nearby villagers, landowners, lodge managers and guides as well as national and international scientists and conservationists. We increase our sphere of influence by collaborating with the Black Mamba Anti-Poaching Unit ([www.blackmambas.org](http://www.blackmambas.org)), Wild Shots Outreach ([www.wildshotsoutreach.org](http://www.wildshotsoutreach.org)), and the Bush Babies, a branch of the Black Mamba APU, focussed on children's environmental education. Promoting positive relations with surrounding communities is one of the most effective ways of diminishing human:elephant conflict

#### **Current Research Projects within the APNR:**

- ***Elephant ID studies in the APNR.***

Much less is known about bull elephants compared to females, and so we have focused our attention on monitoring mature bulls - mapping their movements, social interactions, recording their vocal communications, and trying to understand the genetic relatedness between bulls. So far, the team have identified over 1,500 bull elephants from 5,500 encounters who call the APNR home. With this information we are working to uncover long-term population trends in the area and are especially keen to understand how changing environmental conditions and management practises influence the population. This will help conservation authorities make accurate predictions and establish plans to secure the future of Greater Kruger's elephants. With the ID study we can develop specialised mark recapture models which provide valuable data on population estimates outside and to a greater level of detail than the annual aerial census. **Update:** We have just produced an "Elephant ID Guide" sponsored by Amarula, showcasing a number of iconic elephants regularly seen within the APNR. This is being distributed to lodges to help guides and guests learn more about these individual elephants and explains why some are

collared and what we learn from tracking their movements long-term. We hope to be printing more of these ID guides in future to eventually supply each lodge within the APNR with a copy.

- ***Developing Fear Landscapes – how do elephants respond?***

Greater Limpopo Transfrontier Conservation Area (GLTCA) represents a unique opportunity to study the cross-border movements of 29 potential transboundary elephants collared by Elephants Alive between 2007 until present, between Kruger National Park (South Africa) and Limpopo National Park (Mozambique). Since 2012, illegal killings of elephants have increased over time, specifically in Mozambique. Our elephant movement analysis show that elephants respond to this fear landscape by being more active at night, hiding in thick vegetation during the day and actively avoiding areas seen as potential danger. This project highlights once more the remarkable memory and adaption skills of elephants as they clearly have a temporal and spatial awareness of where it is safe and unsafe inside and outside of Protected Areas.

Part of our tracking program in the Kruger is also to understand what motivates elephant movements. Their movements can be driven by nutritional resources, social- or safety benefits. Past management practices also play a role as elephants seem to retain a memory of fences erected in the past. We have a special project focused around Phalaborwa mine where we have seen that the elephant home ranges of elephant collared in this area are smaller than those from other areas. In collaboration with Nottingham University we are determining how geochemistry might be influencing elephant movements and range use.

- ***Elephant Mortalities – what does it tell us?***

Monitoring mortalities is important for keeping track of population dynamics and growth. If our mortality officer, Tammy Eggeling, can be contacted to collect ear patterns from each dead elephant as we are kindly provided with this information from the Wardens, we can use the data in our specialised mark recapture model, which we are developing. Mortality information also contributes to our ongoing research by enabling us to collect additional body measurements and samples to look at ageing techniques, diet and stress levels. We can use trophy-hunting data to ensure the practice remains sustainable concerning sought after traits and effects on the population structure and behaviour. To determine whether we are impacting on a phenotypic traits, such as tusk size, we would also require information on each tusk weight harvested during trophy hunts. In addition, we can use collaring movement data from elephants to try find hotspots along the railways within Balule to try and minimize train-induced mortalities. Due to emerging threats such as poaching and even elephant skin trade, it remains crucial to continue monitoring all elephant mortalities so that management can respond appropriately as soon as illegal forms of elephant mortality are detected.

- ***Protecting Large Trees for the Private Landowners Community.***

Landowners in the private reserves are concerned about elephant impact on large trees. In these areas, elephant impact is heightened due to the considerable number of artificial waterholes within the landscape. Our research is looking at ways to protect iconic trees, and to objectively assess the effectiveness of each method. These methods include rock-packing, tree-pasting, wire netting, spraying chilli oil (being trialled on Thornybush) and the ongoing bee hive project on Jejane (see below)

- ***Bees, honey harvesting and bee gardens***

Bee hives are being used to protect iconic trees on Jejane. This project has included building hives, obtaining bee swarms and hanging hives in trees to prevent elephant impact to iconic marula trees (*Sclerocarya birrea*). The project proved most effective at mitigating against elephant impact. The next phase of the project is looking at what financial returns can be obtained from harvesting honey and wax products to offset the initial layout costs of the project. Honey, lip balm and soap products are presently being sold by Elephants Alive and are proving highly sort after items. The bee project is now being expanded to work within three local communities - to

demonstrate the importance of ecosystem services, and to develop new skills and generate additional income by living in harmony with nature.

***If you would like further details of any of the above projects, please email [info2u@elephantsalive.org](mailto:info2u@elephantsalive.org)***

**Elephants Alive will send quarterly updates on these research programmes, together with images, to key APNR stakeholders as requested.**