

No silver bullet to manage booming elephant ‘problem’ in southern Africa



The decline in elephant numbers across most of Africa has not been uniform, with many populations growing rapidly in the southern part of the continent. The recent ‘Elephant in the Room’ conference in Zimbabwe focused on three main options — chopping elephant numbers; limiting further growth via contraception, or finding more space for a species that has already lost 85% of its historic living range due to human expansion. There was also a more limited discussion on the ‘do nothing’ option.

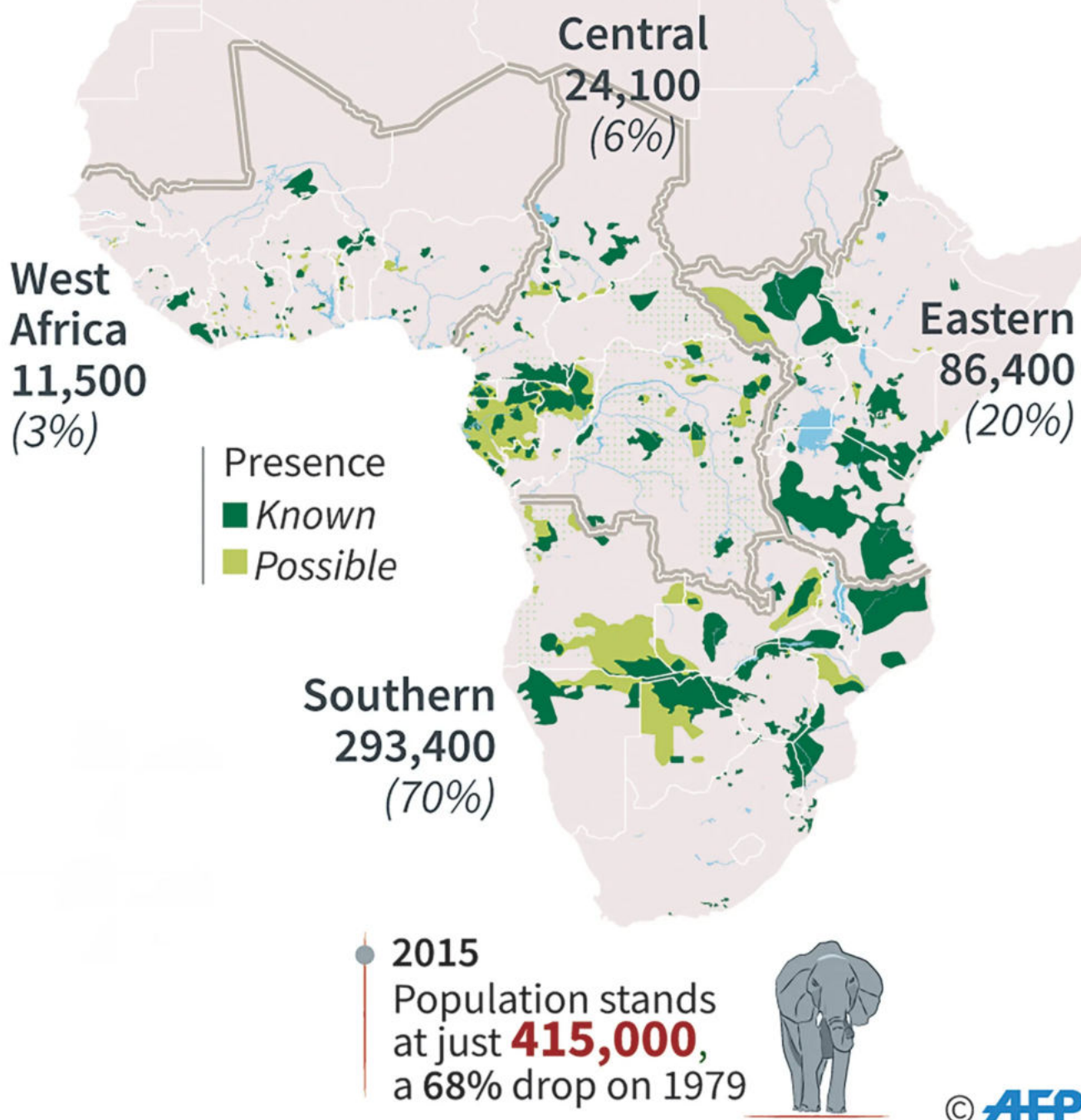
It seems bizarre to be talking about killing or curbing the growth rate of Africa’s elephants, considering that they were listed as “endangered” barely a decade ago following a dramatic 60% population drop over the past 50 years.

Yet, the decline in elephant numbers across most of Africa has not been uniform, with many populations doing just fine or growing rapidly in the southern part of the continent. To the extent that some southern government officials and wildlife managers are calling for concerted action to limit further growth in certain parks, including the controversial resumption of large-scale culling operations.

At a continental level, roughly 70% of Africa’s 415,000 remaining elephants are in southern Africa, about 20% in East Africa and barely 10% in Central and West Africa.

Regional population estimates 2015

Latest available data
Percentages rounded up



Map of Africa's elephant populations, with chronology of species protection measures, the ivory trade ban and poaching. (Map: AFP / Kun Tian and Gillian Handyside)

Botswana alone has about 130,000. Zimbabwe has the second largest population, now nudging 95,000, with about 44,000 in South Africa (mostly in Kruger National Park).

While some commentators argue that there are now “too many” elephants on the sub-continent, others insist that overall numbers alone are a blunt tool and that the concept of carrying capacities are subjective and outdated.

The debate has also become increasingly polarized. Last year, Botswana government officials threatened to send 20,000 elephants to Germany and 10,000 to London to give Western observers a flavour of the safety risks faced by several rural communities in Africa.

Several of these dilemmas came to the fore during the recent “Elephant in the Room” conference in Zimbabwe, a platform organised by the [Gonarezhou Conservation Trust](#) (GCT) — a partnership between the Zimbabwe Parks and Wildlife Management Authority (ZimParks) and the Frankfurt Zoological Society.

The main focus of the 29-30 October meeting in Harare was the growing elephant population in Gonarezhou National Park in southeast Zimbabwe.

But the discussions also have broader relevance closer to home, where similar debates have emerged around elephant growth in several South African reserves, notably [Madikwe Game Reserve](#).



Elephants forage beneath the Chilojo Cliffs in Gonarezhou National Park. (Photo: Bad Rabbit Studio)

Gonarezhou, or “place of the elephants”, now has about 11,500 elephants. With more than two elephants per square kilometre, it has one of the densest elephant populations in Africa — despite previous mass-culling operations and a devastating drought in the early 1990s.

Welcoming the delegates, veteran wildlife project manager and pilot [Hugo van der Westhuizen](#) expressed hope that the conference would guide some of the tough decisions ahead for the benefit of people, elephants and biodiversity conservation — guided by robust scientific research.



Gonarezhou Conservation Trust conservation director Hugo van der Westhuizen. (Photo: Tony Carnie)

The Harare meeting focused on three main options — chopping elephant numbers; limiting further growth via contraception, or finding more space for a species that has already lost 85% of its historic living range due to human expansion.

There was also a more limited discussion on the “do nothing” option and the much harder task of trying to manage the impacts of Gonarezhou’s elephants within the limited space that remains for them.

A case for culling

In his presentation, “Notes on the elephant overpopulation problem and culling in Zimbabwe”, wildlife ecologist Professor David Cumming said elephant numbers had increased dramatically in this country, from about 4,000 in the early 1900s to well over 90,000 today.

He also cautioned that elephant populations can double in 12 to 15 years under favourable conditions, whereas the woodland vegetation they damage in their quest for food can take more than a century to recover.

Cumming, a former ZimParks deputy director, suggested that about 7,000 elephants needed to be “taken out” from Gonarezhou to reduce their density to a level that would allow woodlands to regenerate — but he acknowledged that such a massive cull was very unlikely to happen.

He believed that protected areas were not established to protect elephants alone, but a whole range of animals, vegetation, birds and insect life.

Despite “negative public reaction” and adverse impacts on the social structure and population dynamics, he argued that the main advantage of lethal culling was the ability to reduce elephant populations rapidly, on a large scale.

Cumming did not quantify the monetary costs of culling elephants in Gonarezhou, but based on previous culling campaigns in Kruger, other researchers have estimated the cost of killing and processing the meat and other products from 800 elephants at about R5.3-million (roughly R6,600 per elephant in year 2005 values). This however excludes the income from elephant products such as meat, hides or ivory. The researchers estimated that the income from these products could generate about R10.9-million — providing a profit of about R5.6-million. Selling the ivory would lead to double this profit (but the sale of ivory is illegal).

A case for contraception

Contraception is already used in at least 47 parks in southern Africa after being extensively researched for nearly 25 years. Though it limits further growth, it does not immediately reduce the size of large herds.

The largest current project is in the 96,000 ha Hluhluwe-iMfolozi Park in KwaZulu-Natal where up to 500 cows are treated with a vaccine every year to suppress further growth of the current population of about 1,100 elephants. Elephants in the Ithala, iSimangaliso and Tembe Elephant reserves are also on contraception.

Dr Audrey Delsink, an ecologist who has directed the Humane World for Animals’ elephant immunocontraception project since 2000, argues that culling is no longer publicly acceptable and has also been found to have several unintended impacts. This included social disruption, psychological trauma, abnormal behavior, temporary emigration from culling zones as well as altered population dynamics and changes in age structure.

Contraception was therefore a more ethical and scientifically defensible alternative to culling.

The porcine zona pellucida (PZP) vaccine, derived from the ovaries of dead pigs, stimulates the production of antibodies that prevent male sperm from binding to the female egg, preventing cows from conceiving.

It is manufactured at the University of Pretoria’s Onderstepoort veterinary laboratories and injected into the rumps of breeding-age cows with a dart, via helicopter. In the initial phase, two doses have to be injected in the first year, reducing to a single dose per year thereafter.

Delsink stressed that the method used locally is immunocontraception — not hormonal contraception. Unlike permanent sterilisation methods, cows can resume breeding if the PZP treatment is stopped. Delsink says extensive research showed that there were also no adverse side effects and the treatment could be scaled up for use in larger reserves such as Gonarezhou.

Questioned on the monetary costs, Delsink gave a rough estimate of \$1-million in the first year (about R17.5-million), reducing to about half that amount thereafter when only a single vaccine dose was needed.

Acknowledging that costs may be a deterrent to higher uptake by other reserves, she notes that Humane World for Animals has assisted some South African parks with start-up costs.

A case for translocation

Josh Mostert, representing a Harare-based wildlife translocation company, told the conference that it was “easily possible” to transport hundreds of elephants from Gonarezhou to a less densely populated park — if such a destination was suitable or available.

As an example, he calculated it would cost about \$2-million (about R35-million) to move 860 elephants to the Zambezi Valley over a six-month period.

“But I don’t think (translocation) is the silver bullet that many have been hoping for. Yes, large numbers of animals can be moved, but what comes after that?” he asked, noting that mortality rates during translocation could be as high as 2%, or substantially higher in the months following relocation.

“We can uplift 1,000 elephants from Gonarezhou, but is it responsible? Are there suitable areas to which they can be moved? Will there be protection for them? Will they be safe? How will their presence affect neighbouring communities?”

Though it was possible to move elephants up to 3,000km by truck over three days, stress and death rates increased the longer they remained in a truck.

Capturing such a large number of animals would also stretch over a period of months and there was a risk that family groups could be separated during capture. If a capture team only managed to capture five animals from a family group, it would be irresponsible to capture another five from a different area simply to fill up the trucks.

Just to complicate things

Earlier in the conference, several researchers illustrated some of the multiple complexities in managing the impacts of elephants boxed-up within limited living spaces.

Independent wildlife researcher Kevin Dunham warned that if Gonarezhou’s growing elephant population was not curbed, “the next drought will do it for you”, especially with older cows and young calves.

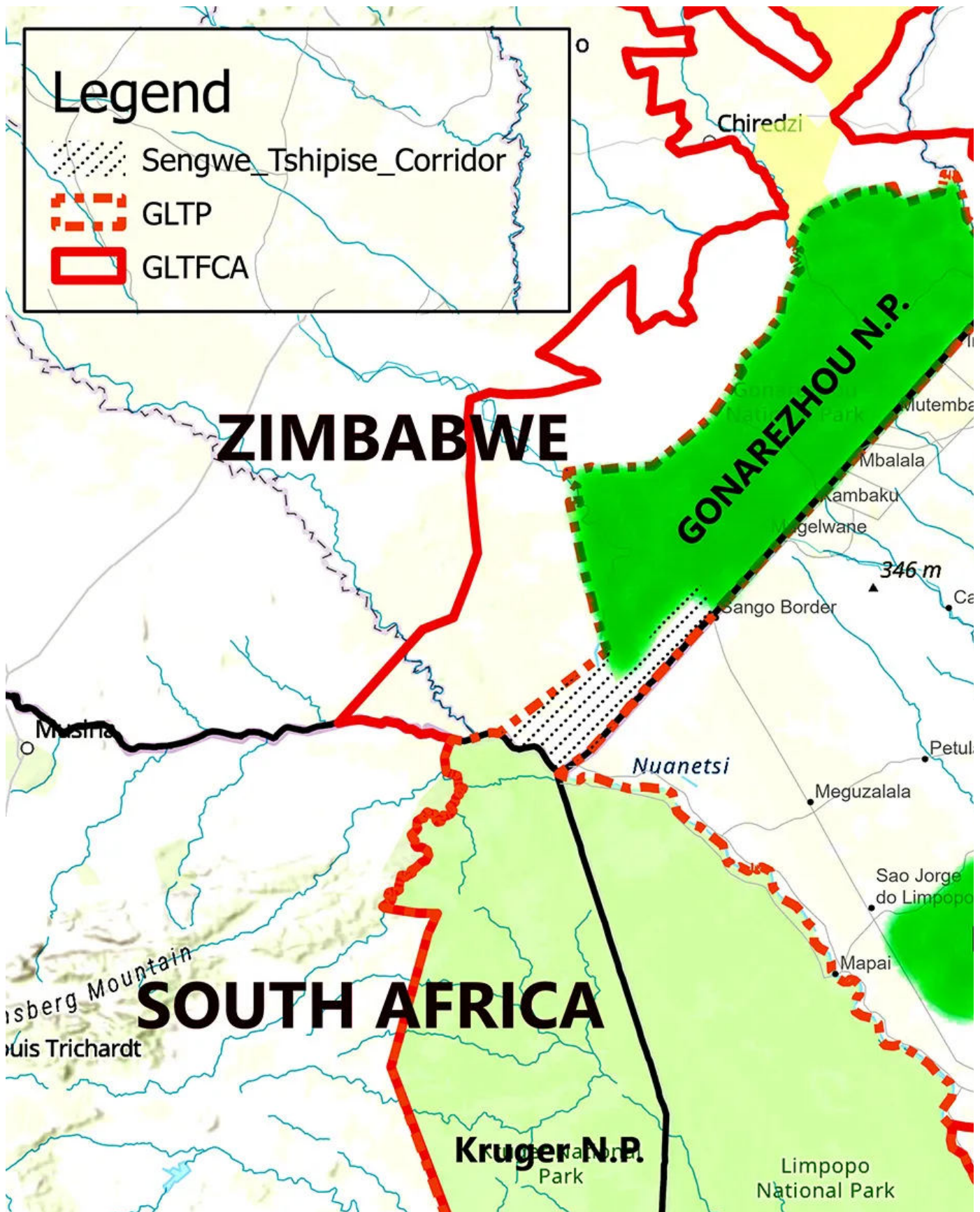
“My personal opinion is that if you leave them alone they will carry on wreaking havoc... everybody talks about the elephants, but not the trees.”



With a population of 11,500 elephants, Gonarezhou has one of the highest densities of these animals in Africa. (Photo: Zanne Labuschagne / FZS)

A further problem was highlighted by Dr Bob Mandinyenya, the Gonarezhou Conservation Trust's head of scientific services. While the reserve is partially fenced, several areas adjoining local communal areas and the border line with Mozambique are not. The trust has been hoping that elephants would move into the Mozambican section of the Greater Limpopo Transfrontier Park — including the Banhine and Zinave national parks that are roughly 80km away.

Yet, says Mandinyenya, the Zimbabwean elephants are just not dispersing into Mozambique as expected.



Border fences separating Gonarezhou and Mozambique have been removed. But despite the removal of this transfrontier barrier, elephants have not dispersed into the neighbouring Banhine and Zinave national parks. (Source: Gonarezhou Conservation Trust / Sheena Carnie)

Based on a collar-tracking project, Mandinyanya noticed that more elephants moved out of the park into Mozambique during the Covid-19 pandemic, at a time when tourism and hunting outside the park came to a brief halt.

During the 2016-2022 tracking project a limited number of elephant bulls moved as far as 60km from Gonarezhou (but then returned), while most cows typically did not disperse farther than 15km from the park. The collared elephants also avoided areas outside the park where human population densities were high.

He recommended that “immediate interventions” were needed to address barriers to the movement of elephants to Zinave and Banhine National Parks. This should include more functional corridors to allow elephant dispersal.



An elephant bull forages in one of the woodland areas where taller trees have been pushed down or shortened by feeding elephants. (Photo: Gonarezhou Conservation Trust)





Dr Bob Mandinyenya, the Gonarezhou Conservation Trust's head of scientific services. (Photo: Tony Carnie)



Humane World for Animals director Dr Audrey Delsink. (Photo: Tony Carnie)

Mandinyenya said he was not in favour of culling and called for further engagement with the Mozambican government and communities to address the barriers to elephant movement.

[Dr João Almeida](#), director of the Mozambique Wildlife Alliance, notes that 25% of that country has been set aside for wildlife conservation, so there was ample space for elephant reintroductions.

“Mozambique is a big country, possibly with less elephants than the whole of Gonarezhou, so there are opportunities for elephant expansion — but if people have nothing to eat they are not open to dialogue (about elephant movement corridors).

Hoping to reduce such conflicts between farmers and elephants, the alliance has established a [Protected Farming Communities](#) model by installing solar-powered electrified fences and other protection measures.

Back in Gonarezhou, a [recent study by Lloyd Nzombane](#) has flagged elephant trophy hunting on both sides of the border as a further barrier to elephant movement and dispersal.

After comparing elephant movements in a non-hunting area and an adjacent hunting area, Nzombane and his colleagues found that most elephants were being hunted very close to the park boundary — creating a “barrier of fear” for elephants.

Their study showed that 51% of hunted elephants were shot within 1km of the park boundary (with some killed just 20m from it). As a result, elephants were now only venturing outside the park at night.

Impacts on vegetation and other species

Malilangwe Trust ecologist Dr Bruce Clegg underlined the disproportionate role of male elephants in transforming the vegetation. In simple terms, bulls knock over or damage more trees because they are larger, stronger and require more food than cows.

Fellow researcher Professor Tim O'Connor told delegates that mopane woodlands, often a staple food for elephants, had been radically transformed but were still "holding out".

While drought and other natural factors played some role in this, there was no doubt that elephants were mostly responsible for the "stark" structural change of the woodlands, especially the loss of taller trees that some threatened or endangered bird species depend on for nesting.

Other researchers have also rung alarm bells about the impact on other tree species. Last year, Jarryd Foster warned that the very high density of elephants was [threatening the park's iconic baobab trees](#).



Researchers fear that baobab trees in the 500,000-hectare park are under increasing threat from elephants, which strip away bark and gouge the trunks in search of moisture during the dry season. (Photo: Bad Rabbit Studio)

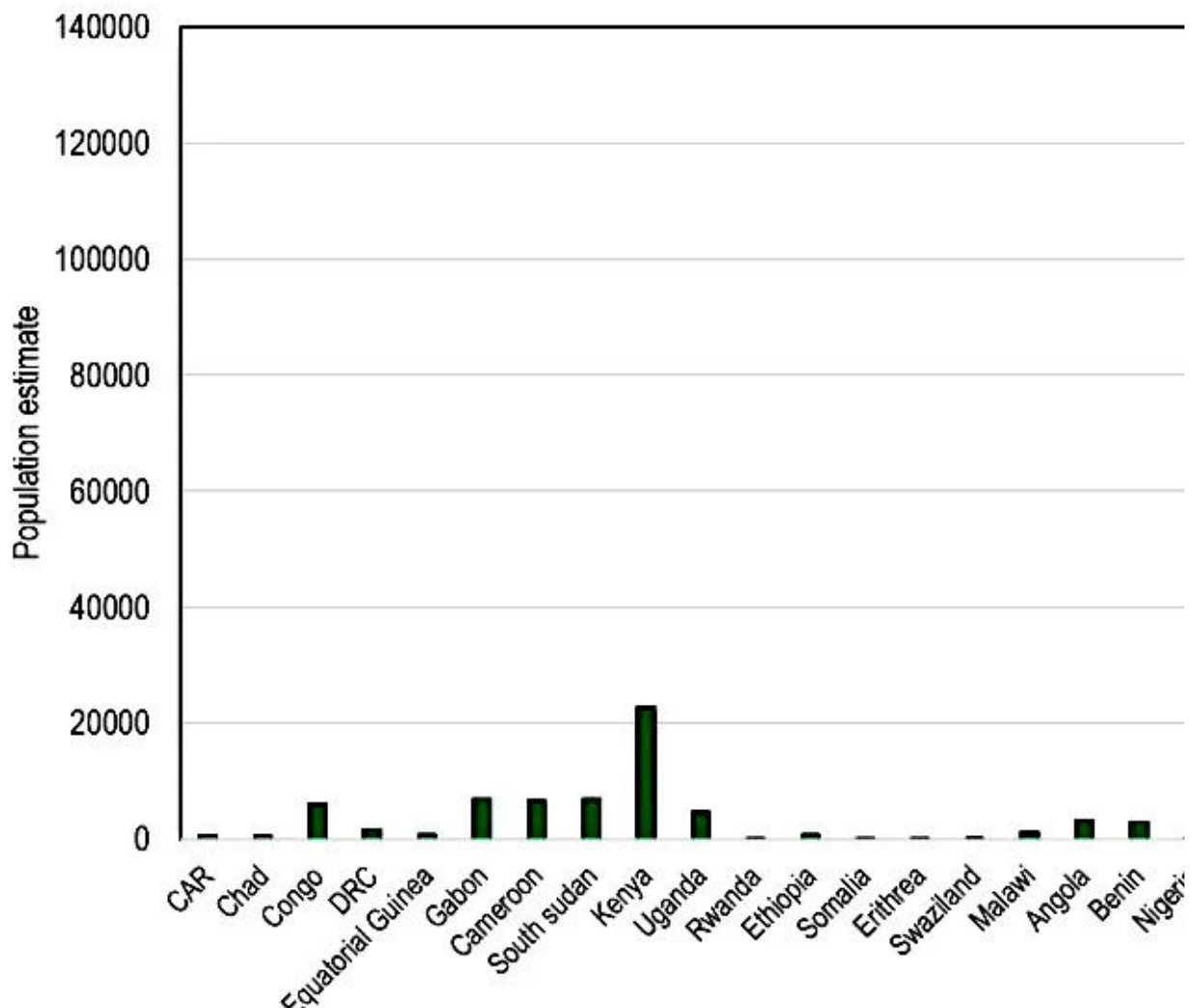


The shredded stump of an ancient baobab, destroyed by elephants. A recent study showed that in some parts of the park, elephants had debarked 99% of these trees to some degree, and gouged holes in the stems of 22% of trees. (Photo: Gonarezhou Conservation Trust)



A family group of elephants cools off in the sandy floodplain of the Runde River. (Photo: Bad Rabbit Studio)

The Contribution of Southern Africa



Though elephants have disappeared or been decimated in West and Central Africa, their numbers have increased in large parts of southern Africa. (Source: African Elephant Database)

After examining more than 560 baobabs across the park he found that elephants had debarked 99% of these trees to some degree, and gouged holes in the stems of 22% of trees.

“If current levels of elephant utilisation persist, baobabs may become extirpated within Gonarezhou, unless absolute or partial refugia from elephant impact exist.”

A further concern was raised by Clegg about black rhinos, a critically endangered species reintroduced to a section of the park recently. During dry periods elephants were likely to exert heavy pressure on the vegetation in this area, to the detriment of black rhinos.

“They (elephants) won’t cause the rhino to go locally extinct, but in poor years the rhino reproduction rate will drop... the elephants will set a ceiling (on the rhino population growth rate.)”

Total numbers alone a blunt tool

Yet amid these concerns, SANParks large mammal ecologist [Dr Sam Ferreira](#) cautioned against using total elephant numbers in any particular park as the sole yardstick for decision-making.

“It’s not just about finding one magical number or about ‘stocking rates’ and ‘carrying capacities’. It is about understanding the activity of elephants at a local level and trying to mitigate those impacts at a local level.”

By the end of the conference, however, opinions remained sharply divided on what to do. There were just no easy solutions, said Gonarezhou Conservation Trust director Simon Capon.

“We are trying to predict future scenarios based on the best research available — yet (in taking decisions) you are almost damned if you do and damned if you don’t.”

What did seem certain, however, was a “major die-off” of elephants in Gonarezhou if the park is hit by another serious drought in the next few years. **DM**

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