



MAKING ROOM

Elephant populations are soaring in some parts of Africa. **Emma Marris** discovers there's no single way to fit them in amid the people.

The car creeps towards the left as the driver tries to get as close as possible to the group of elephants foraging at the road's edge. The elephants walk silently, communicating in companionable purrs. The loudest noise is the crackle of the tough foliage they are eating.

"You're crowding Agatha and she's going to have to press into the bush to get by," says Katie Gough from the back seat. Gough, based at Nelson Mandela Metropolitan University (NMMU) in Port Elizabeth, South Africa, has been studying these animals for four years, and can tell most of the elephants apart by the wear and tear on their ears or by idiosyncratic wrinkles. She is right about Agatha, who, slowly moving her enormous body into the thorny shrubs, turns her head and gives the occupants of the car a look that everyone reads — scientific prohibitions on anthropomorphization be damned — as reproachful.

Agatha's home, Addo Elephant National Park in South Africa, has too many elephants. In 1954 there were 22 animals in a park of about 2,300 hectares. They were the remnants of a herd hunted nearly to extinction by one hired hunter in 1919. He was carrying out

the orders of local orange growers who were sick of elephants gorging themselves on their crops. Today, there are around 460 animals in about 26,000 hectares — or roughly double the 1954 density. Throughout its history, densities have waxed and waned; in the main camp of Addo they now stand at about three elephants per square kilometre. One estimate of the maximum number of elephants this area can sustainably support is about 0.5 elephants per square kilometre¹.

"Twenty or thirty years ago, things were black and white," says Graham Kerley, the elephant expert at NMMU who drove too close to Agatha. "You had elephant management and you had *laissez-faire*." Although faced by an excess of elephants, Kerley is clearly still charmed by them, as he is by all the carefully managed animals at Addo — among them the elegant kudu, zebras with tawny rumps, and the immense ostriches sprinting along the road.

These days no one believes in *laissez-faire*. The effects that too many elephants have on their environment are easy to see. Climbing the stairs over a fence to cross from an elephant area into a pachyderm-free zone, the

landscape switches from patchy shrublands to a lilliputian forest containing a wide variety of plants, including spectacular aloes.

Giant appetite

In places where the Addo elephants have already consumed the juicier vegetation, they now feed on bushes such as spekboom, sweet thorn and the bee-sting bush — plants as tough and spiny as their names suggest. In the Addo area, elephants may threaten some 168 species of plants with extinction². These include the geophytes and the aptly named succulents, including the jade plant. And as the miniature forest turns into miniature savannah, other animals will see their habitats change. Animals that live in areas dense with vegetation, such as the cape grysbok and bushpig, will have their habitats fragmented.

As the Addo experience shows, if your goal is to preserve an entire ecosystem and not just the elephants within it, pachyderm numbers have to be controlled. But where park managers, scientists and government experts disagree on the best means of managing elephant populations, the elephants can find themselves left in limbo.

For an outsider, it's a challenge to switch

from seeing African elephants as much of the Western world usually does — as majestic, rare animals dying at the hands of villainous ivory poachers — to a more nuanced, more African conception. Depending on who and where you are in Africa, elephants may also be livelihood-destroying crop-raiders, expensive tourist lures, environmental menaces, or dinner.

Different countries, different stories

So it comes as no surprise that Africans can become irritated when told how to manage their elephant populations by interested parties abroad. Well-meaning and sometimes technically expert outsiders are constantly offering opinions on whether to cull animals, whether to try contraception, whether some kinds of ivory should be legally sold, and so on. Often, onlookers will treat the whole continent as a single case, when each country and each area has its own problems to solve.

Most African elephants still live outside protected areas, and so they increasingly come into fraught contact with Africa's expanding population. Botswana has an estimated 150,000 elephants roaming without major barriers between them and pastoralists herding livestock. In Namibia, elephants range free of people in the western deserts, but they butt heads — sometimes literally — with agriculturalists elsewhere in the country. In other countries, elephants have been fenced into reserves or hemmed into protected areas by development as more land is built on.

Across southern Africa as a whole, elephant populations are increasing by about 4% annually, while herds in central and western Africa continue to struggle with poaching and habitat fragmentation². “I could tell you a different story for every African elephant range,” says Holly Dublin, an elephant expert who is chair of the Species Survival Commission at the World Conservation Union.

Nowhere do humans and elephants pack in more tightly than in South Africa. So it's tempting to see the country as an example of how elephant management might look across Africa in the future. But the country is different to others in that there are fewer than half-a-dozen unfenced elephants nationwide. These are the elephants of the Knysna forest, which have held on to their freedom only by virtue of living in an inaccessible valley. All the other elephants are descendants of remnant herds, living behind strong fences built with materials such as railway ties and mineshaft cabling.

“South Africa cannot be considered indicative of the challenges facing elephant conservation

in the rest of Africa,” says Dublin. “It is more like living in America and trying to take care of elephants. For the most part, rural communities are not trying to make their livelihoods right next door.”

South Africa itself has only a small fraction of the continent's elephants. But to judge from media reports, they might as well have almost all of them. Coverage of the culling controversy is largely responsible for this. Until 1994, managers at South African National Parks (SANParks) would shoot elephants in places such as Kruger National Park, far north of Addo on the Mozambique border, whenever their numbers got too high. The slaughtered elephants would be given to local people as a free meal. Other elephants were transported to parks that wanted more elephants or sold to private reserves.

Before the modern practice of culling whole family groups was introduced, culling occasionally resulted in orphans that grew up to behave antisocially. For example, some orphan elephants, which were moved from Kruger to other parks, famously became maladjusted juveniles that went around killing rhinoceroses³.

Getting in a flap

In 1994, culling was stopped because of the objections of local and foreign animal rights groups. Elephant densities have since increased, and in Kruger, where there are now about 0.63 elephants per square kilometre⁴, large bulls flex their muscles by pushing over baobab and marula trees. And after a decade of debate, in 2004, SANParks announced that a whole suite of tools — including culling — should be considered for managing elephant numbers.

“Opposition to lethal control is usually favoured by affluent people.”
— Hector Mogame

This news was not received well, especially by wildlife conservation groups, who claimed that culling was inhumane, even unethical.

Hector Mogame, executive director of Conservation Services at SANParks, Pretoria, doesn't see it this way. “The issue of ethics is about power,” he told the Society for Conservation Biology in Port Elizabeth this July. “The viewpoint of opposition to lethal control is usually favoured by affluent people — people with money.” Citing the furore over SANParks' plan to resume culling, he says the debate is about the people on the ground being trumped by the rich and powerful.

SANParks officials have historically had a relatively free rein to manage the animals within their park boundaries. But after the 2004 outcry, South African government ministers stepped in and asked SANParks to provide scientific justification for its culling plan. In 2005, Marthinus van Schalkwyk, minister of tourism and the environment — and these two are very closely linked in South Africa — called for a scientific round table representing different views on the elephant management debate. Mogame and Kerley were two of those invited.

In January 2006, the Elephant Science Round Table decided that Kruger didn't have enough data at that moment to show culling was necessary, but smaller reserves experiencing “bigger pressures” might need to do something immediate. The group has continued to meet unofficially to advocate for a major research push on elephant management.

SANParks has moved away from suggestions that there is an ideal number of elephants. “The maintenance of biodiversity is best achieved by permitting — or if appropriate actually encouraging



Changing diet: elephants move on to sweet thorn (above) once the jucier aloes (left) have been consumed.



Holly Dublin believes all the options for managing elephant populations need to be available.

— variation in time and space, rather than attempting to manage for stability,” says Wanda Mkutshulwa, head of communications at SANParks. As of now, the official management strategy of SANParks is “wait and study”.

In the meantime, the elephants are continuing to restructure their habitat. Their movements are dictated by the presence of food and, crucially, water. Around any surface water where elephants drink, you will find a ‘piosphere’, a circle of reduced vegetation cover demonstrating the landscape-changing power of these animals. The shrubs remaining have just a few leaves, and seem as if they are clinging to life. There is no grass, and warthogs are pale from dust bathing. The word ‘desertification’ springs to mind.

Adrian Shrader of NMMU argues that if you pack water-holes and elephants in so densely that the piospheres begin to overlap, landscapes may begin to suffer irreversible losses. But even without such pressures, a high number of elephants will over time reduce plant diversity.

Which path to tread?

For now, park managers still have several other options besides culling that they can actively pursue. But which is best? Most elephant experts have a pet intervention they study or favour. Round-table member Bruce Page, at the University of KwaZulu-Natal, Durban, is keen on contraception, which has promise but is extremely awkward in execution. It requires identifying elephants, and then shooting hormones into them from a truck or helicopter. Field trials at Kruger recorded reasonable success rates.

In Page’s population models, contraception and culling affect population structure in different ways. The proportion of the population under ten years of age increases under culling, but decreases under contraception. When population control ceases, you get a baby boom after culling that you don’t get after the cessation of contraception. Still, Page estimates that under operating conditions, the best one can hope for is to prevent about 75% of the females from giving birth.

Other experts call for the removal of artificial water sources, which are sometimes used to lure the animals to within sight of tourists. In Addo, one can have lunch at the park restaurant and then stroll across the car park to a viewing area overlooking a water-hole, and

expect to see at least one or two massive grey beasts having a drink.

But there are at least two problems with removing the water-holes. At Addo, water-holes had to be put in because the river, which would have been the water source for elephants in the area, is not part of the park. Without the water provided by SANParks, the Addo elephants would perish along with all the other mammals. Another problem is that when you use water scarcity to limit elephant numbers, they die of thirst. This would be an even worse public-relations disaster than shooting them, according to Shrader. “It would hit the evening news: skeletal elephants and their babies.”

More controversially, Rudi van Aarde of the University of Pretoria advocates knocking down all the fences you can and allowing natural metapopulation dynamics to manage elephant numbers. The idea is to get as close to ‘natural’ as possible. “It is when you put up hard fences and dig the land full of water-holes, that we are creating problems that we shouldn’t try to solve through the barrel of the gun or through contraception,” says van Aarde.

Critics note that many people would be angry, not to say frightened, if the fences between their village and a herd of elephants were removed. Van Aarde insists that enough unpopulated land could be cobbled together to

avoid this, and that if elephants caused problems at the extremes of their range then they could be shot by villagers. But this would put the onus of management on local people with a lot to lose. “Maybe with time this will prove too extreme to be applicable,” he admits.

The argument over elephant ranges ultimately depends on how you draw the maps. Many people feel that the areas currently occupied by elephants in Africa are as large as can be reasonably expected. With human numbers growing as they are, there is no space for the elephants to expand into.

And even when range expansion has been tried, there’s scant evidence that taking down the fences encourages elephants to populate a new area. In many cases, they like it where they are. If they can get enough water, why move?

The removal of a fence on one side of Kruger to create a park that crosses into Mozambique has reportedly boosted the transit of people in stolen cars much more than it has increased the movement of elephants.

“I suspect that in the end we will come up with a uniquely African solution.”
— Graham Kerley

Packing their trunks

There are also proposals to move elephants from areas where they are living in high densities to areas where numbers are fewer, but according to Dublin, interest in that idea has “cooled down” in recent years. Moving an elephant is — no surprise here — an enormous undertaking. One must knock them out and then heft them around in trucks chaperoned by experienced personnel. It is very expensive. Another concern, according to Dublin, is the destination. For example, if it is sparsely populated because poachers are killing elephants there, why move



Effects of drinking: elephants can dramatically alter the landscape around their water sources.

K. GOUGH



Pushing for research: Graham Kerley works with officials at Addo Elephant National Park, which contains more elephants per square kilometre than some experts estimate it can sustainably support.

the beasts into a death trap? Some non-governmental groups such as the Massachusetts-based International Fund for Animal Welfare and the South Africa-based Peace Parks Foundation have funded relocations, but usually on the scale of tens of animals. The Kenya Wildlife Service, which manages elephants in that country's protected areas, relies heavily on relocations, as it does not cull.

Ask any elephant expert about the various management options, and they will usually say they may need to use all or some, depending on the situation. "You cannot expect that one size fits all," says Dublin. "If you take away any of the tools, that is not the best thing for elephants or for Africa."

Above all, elephant managers — be they governments, park managers, or consulting scientists — have to decide the reasons for managing elephant numbers. If it is to achieve maximum biodiversity, one strategy and population density of elephants might be best. If it is for iconic savannah landscapes, or to increase the genetic diversity of elephant populations, other routes may be needed. As Kerley says, "if you just want an elephant viewing park, you might as well just tear all this out and plant alfalfa".

Part of the challenge is that we have only vague ideas of elephant numbers and movements in Africa prior to Europeans showing up with flintlock elephant guns and sailing away with holds full of ivory. Some elephants migrate. Females and their offspring move about together; bulls often live alone. It is no easy task to establish a baseline — whether for elephant numbers or behaviour, or for the landscapes in which they lived.

Even the parts of Addo park that are

untouched by elephants are not a good guide to what the forests looked like before European colonization, because there would have been some elephants around. "What we don't have information on," says Kerley, "is what the landscape should look like and how many elephants will achieve that."

Some argue that culling, although the most controversial intervention, may also be the most 'natural'. Those who study elephants say that they do not change their reproductive behaviour much in the face of food scarcity — although van Aarde and others maintain that elephants do this in savannah ecosystems. Other herbivores will have their first offspring later in life and have subsequent offspring farther apart in lean times. Not so the exuberant elephant, which, given enough foliage to start with, will reproduce and consume its way right into a nasty population crash. So perhaps something else was limiting their numbers in ages gone by.

Mammoth story

We do know that before the Europeans arrived, Africans hunted elephants in pit traps, or, in what must have been a pretty spectacular manoeuvre, running up and slashing them in the Achilles tendon. David Cumming of the Percy FitzPatrick Institute of African Ornithology at the University of Cape Town speculates that human predation has been the key limit

on the population of elephant-like animals — proboscideans — in Africa for more than a million years. He is of the camp that favours predation over climate change as an explanation for the extinction of earlier proboscidean species.

The fossil record confirms that the number of proboscidean species dropped from nine to two after humans appeared on the evolutionary scene. Cumming mentions, too, the many large mammals that humans almost certainly did kill to extinction. So can South Africa's elephants prosper without culling? Is it possible that by protecting elephants in special areas, we are removing what once limited their numbers? Animal rights activists and tourists don't like hunting or culling. But it might be the simplest and most direct way to reduce elephant numbers.

Not all experts agree that pre-gun human predators were capable of taking down enough elephants to directly regulate the population. But even if it's not the 'natural order', it might still have a place in management.

And as Kerley explains, hunting isn't as simple as reducing the total number. "It's not how many elephants you kill, but how you influence resource use through fear. Elephants are incredibly risk averse." So by killing a few elephants near a certain village or farm or water-hole, you may be able to keep the rest of the herd, especially the more timid females and calves, from using that area.

Kerley argues for exploring all options: "I suspect that in the end we will come up with a uniquely African solution.

We might reinstate some level of predation — call it predation rather than culling — but we will also make more space for elephants." And the inescapable conclusion from all across Africa is that elephants do have to be actively managed. It is interesting to look into their large dark eyes — famous for seeming wise, even world-weary — and wonder if they have any inkling that they are no longer in charge. ■

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