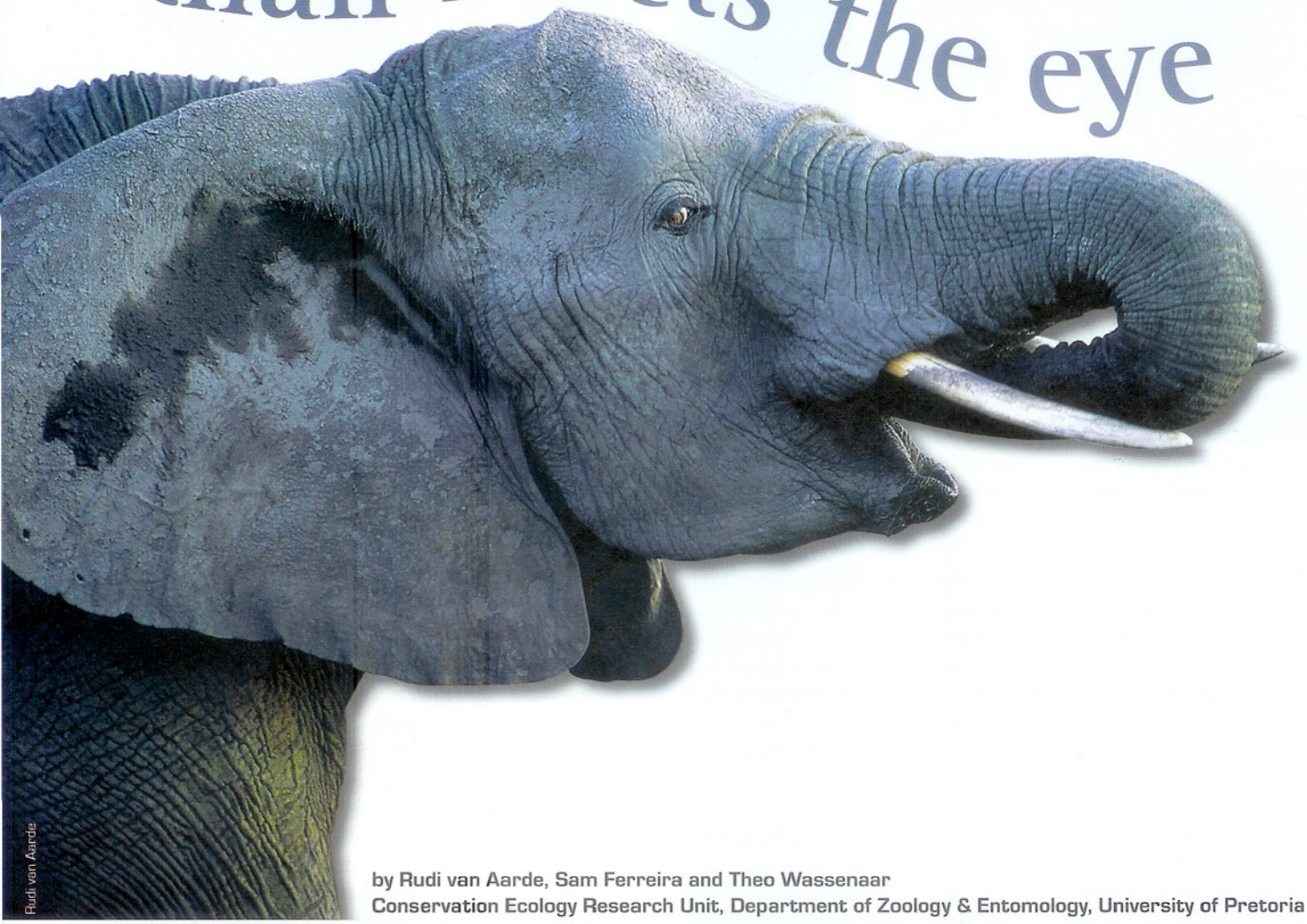
There's more to it than meets the eye



Rudi van Aarde

by Rudi van Aarde, Sam Ferreira and Theo Wassenaar
Conservation Ecology Research Unit, Department of Zoology & Entomology, University of Pretoria

Extreme opinions can sometimes mask the realities. This is especially true in the case of elephants. Their management has polarised opinions into culling and non-culling lobbies – but there is more to elephant management than meets the eye.

The African elephant is a highly visible and charismatic species. Its appeal to the western psyche keeps it in the news and in many ways it is a symbol of conservation successes and failures in Africa.

The realities of living with elephants, however, can detract from their charm. They may destroy the habitat of other, sometimes rarer, species. Elephants that roam where the poorest people eke out a living, impact people's livelihoods in many ways. Not surprisingly, the question of whether and how to manage elephants is a hotly debated issue, often slugged out toe-to-toe between culling and anti-culling lobbies.

The debate has ranged widely, but always returns to elephant numbers. Because their impact on vegetation is highly visible and in places quite profound, it is understandable that most people would conclude there are too many elephants. For many years culling based on the dated concept of carrying capacity has thus been the preferred way to manage the elephant 'problem'. This approach to wildlife management was based on a philosophy of a balance in nature, a golden equilibrium around which everything turns. Today we know that 'imbalance' is a better way to describe nature. A good example, ironically, comes from elephant response to culling. Culling temporarily reduces elephant numbers, but not their impact on vegeta-

tion. This leaves us with a conundrum: if it is not their absolute numbers that impact vegetation, then what does?

Management legacy

The answer lies in how elephant use space, and how our management actions interfere with this. Aside from long-distance migration or dispersal movements, elephant move seasonally between water and feeding ranges, inducing an annual impact-recovery cycle for the vegetation. Obviously, any management action (such as fencing and the artificial supply of water) that prevents these seasonal movements will result in impact on the vegetation. Moreover, and very importantly, by stabilising a key limiting factor – water – natural mortalities decrease and elephant numbers can become unnaturally high.

As an example, consider the issue of impact of elephant on trees in the Kruger National Park, where no animal is further than five kilometres away from a stable water supply. At 0.58 elephant per square kilometre there is every reason to ascribe the sometimes apparently drastic changes in tree density to elephant damage. Yet, many other unfenced places carry many more elephants per unit area without the same apparent impact.

In Etosha, as in Kruger, water is provided and fences have restricted elephant's seasonal movements severely, concentrating them to within eight kilometres from water troughs. Our assessment of fixed-point photographs taken over a 20-year period showed that nearly 20 per cent of Etosha's land surface within four kilometres of all waterholes is losing woody plants at rates well beyond replacement values. Crucially, this impact is continuing even though the elephant population has stabilised around 2 000 for the last 20 years.

Further support comes from our recent satellite tracking of elephants across parks in Namibia, Botswana, Zambia, Mozambique, Malawi and South Africa. This data showed that fencing and water provisioning reduces home-range areas and also the distances between dry and wet season ranges, intensifying seasonal impact on vegetation.

Clearly, management that focuses on reducing numbers is addressing only the symptoms of an ecological pathology that was induced by management in the first place. So we need to focus on the issues that induced the symptoms. This means we need to focus on the management of fences and water, and on the restoration of seasonal movements by reconsidering the delineation of conservation areas. In our view then, the debate should not be about numbers, but about space.

Elephant responses

This is a key insight. It is the main reason why our research group has invested much energy and resources into understanding how elephants respond to space

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in the way they do. In Etosha National Park, as in all other clusters of elephant populations across Southern Africa, we have unravelled elephant population structures and dynamics, their movement across the landscape over time, and how all of these are related to the several potential drivers of population size, movement and impact on vegetation.

Some early work and our recent research show that numbers per unit area (density) influence the age at which heifers calve and the time that elapses between calving. Among elephants living in high densities, heifers have their first calf only at about 18 years, and thereafter at intervals of as long as eight to nine years. Where densities are low, heifers calve at 12 and then at about four-year intervals. These differences in reproductive output stabilise population growth, especially in view of the relatively high death rates induced by droughts.

Under natural conditions, death rates among adult elephants are low – in most places around one to one and a half per cent of them die each year, although this rate may be higher when rainfall is more irregular. However, death rate is much higher among infants and young elephants, especially during droughts. Savannahs are plagued by severe droughts that have a tendency to recur four to six times during the 50 to 60 years of an elephant's life. All elephants therefore stand a good chance to die young when exposed to these droughts. Killing by lion may add to this, especially when food shortages and the heat of droughts weaken the young. Under natural conditions therefore, elephant numbers can potentially be controlled by deaths before the age of three to four years. This is an important factor to consider, because in a slow breeder such as an elephant, the death of only a few young a year could keep the population from increasing.

These two management actions – fencing and water provision – are most likely at the root of the so-called 'elephant problem' in our parks. Clearly, before we consider culling large numbers of elephant, it might be more profitable to address the causes of high numbers, rather than the symptoms.

The future

The obvious solution to the elephant problem would be to reinstate the forces that limit their numbers. By reducing the availability of water and allowing droughts to take their toll, elephant growth rates can be reduced. At the same time, by removing fences and allowing elephant to move seasonally and to disperse over long distances, the local impact caused by high numbers can be reduced.

This means, among other things, that we need to retrieve space for conservation, and we need to establish linkages between conservation areas. In effect, we need to create conservation landscapes – megaparks – in the place of parks surrounded by a sea of human development.

For elephant conservation the establishment of such linkages across landscapes that presently isolate their large concentrations certainly makes theoretical sense. But is this practical?

Megaparks

The linking of land that carries most of Southern Africa's elephants calls for actions that will cross international borders. Initiatives to develop transfrontier conservation areas already have a framework that could cater for linking clusters of existing conservation areas where elephant live. Space is thus available for the dynamics that can overcome impact and limit populations.

Developing a conservation ideal based on megaparks certainly makes sense as it deals with the causes of the problems and not with the symptoms. Future conservation is more than the efforts we put in place to manage numbers in fenced-off places.

Conservation without borders may well become the focus of most of our future planning. After all, when it comes to space, African countries jointly have much to offer.