

Seasons & SPACE

Elephants eat a lot of food, but how much impact do they really have? To understand how they affect ecosystems, Rudi van Aarde and Tim Jackson look more closely at how they use their space.

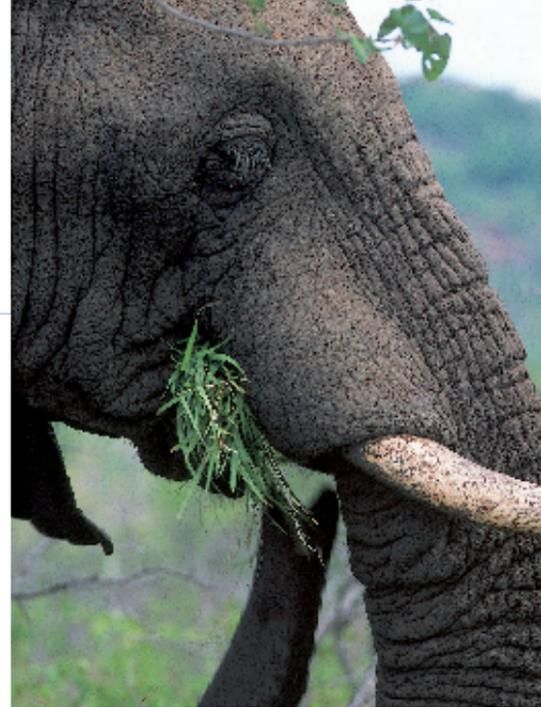
Left to its own devices, an elephant's use of land is determined by two things – food and water. Adult elephants eat between 150 and 170 kilograms every day, and may need to travel considerable distances to satisfy their appetites. They are also heavily dependent on water – they need to drink every 48 hours and bulls can consume up to 200 litres in a day.

Water, be it in the form of lakes, rivers and pools, is key to the way elephants roam. Food quality depends on rainfall and also influences range use. Where it is relatively wet, home ranges may be as small as 100 square kilometres, whereas in arid areas they may span 12 000 square kilometres. (In southern Africa, for example, elephants in the arid west move over larger areas than those that live in the east.) It's safe to assume, then, that a viable

population of say 500 elephants needs considerable space!

Within these home ranges, most elephants have distinct wet- and dry-season habitats and, here again, rainfall influences movements between the two. When it is dry, herds stay close to rivers and lakes and seldom forage more than eight kilometres from permanent water sources. During this time, they feed mainly on trees and shrubs. When it starts raining and the seasonal pools, pans and depressions fill up, they move – and quickly – to regenerated and nutritious grasslands. It is relatively common for elephants to travel more than 50 kilometres from a dry- to wet-season feeding area, often within one or two days. As the grasses dry out and rain-filled pools disappear, elephants turn their attention back to year-round water supplies.

The quest for water can also strongly influence their daily movements. Within protected areas, elephants seem to visit water for lengthy periods, often during the hottest part of the day, where they drink, bathe and play. Outside these sanctuaries, elephants may change their



RUDI VAN AARDE (2)

ABOVE Grasses are the preferred food of elephants during the wet season, when they can afford to move away from rivers and lakes and use the many rain pools that form in the veld.

BELOW Water is central to the way that elephants use space. Consequently, places such as the Okavango Delta and land adjacent to Africa's primary rivers, are prime real estate for elephants during the dry season.

drinking habits in response to human activities. In western Ngamiland in Botswana, where about 4 500 elephants share their space with 8 000 people, the elephants go down to the river at night, avoiding the daytime bustle of human activity.

The way water is managed has an impact on elephant movements – a fact borne out by protected areas that have increased their water points and have experienced a subsequent and dramatic rise in elephant numbers. For example, before 1960 in Namibia, neither water nor elephants were present across large stretches of Etosha National Park during the dry season. Even the wet

season brought very few elephants. Since the introduction of 58 waterholes the population has increased rapidly and, for the past 20 years, about 2 000 elephants have been year-round residents in the park. Similarly, following the sinking of 12 to 15 waterholes in the nearby Khaudom Game Reserve, a combination of breeding and immigration has seen the population rise from 80 in 1976 to about 3 400 in 2004. The colonisation of Hwange National Park in Zimbabwe by elephants and other wildlife has its origin in the installation of 60-plus water points that began in the 1930s. Before then, Hwange only hosted elephants during the wet season.

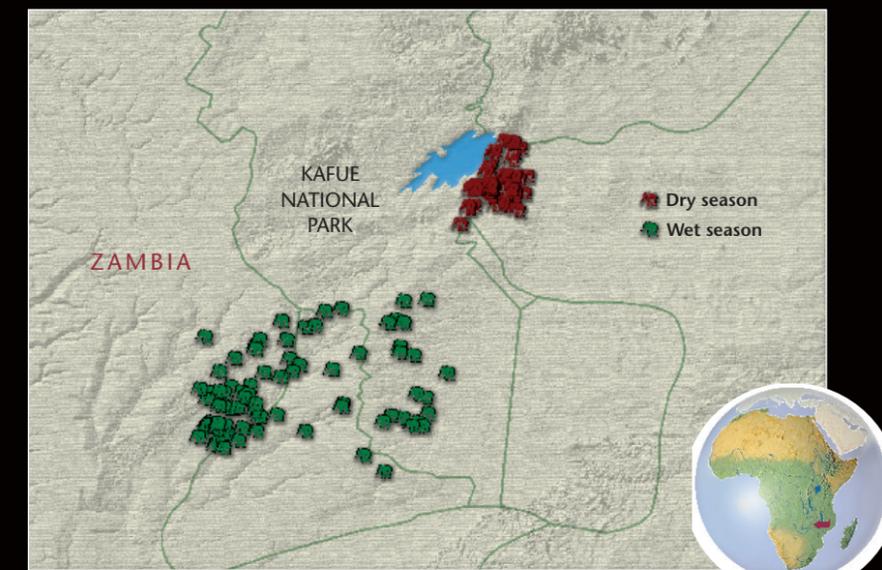
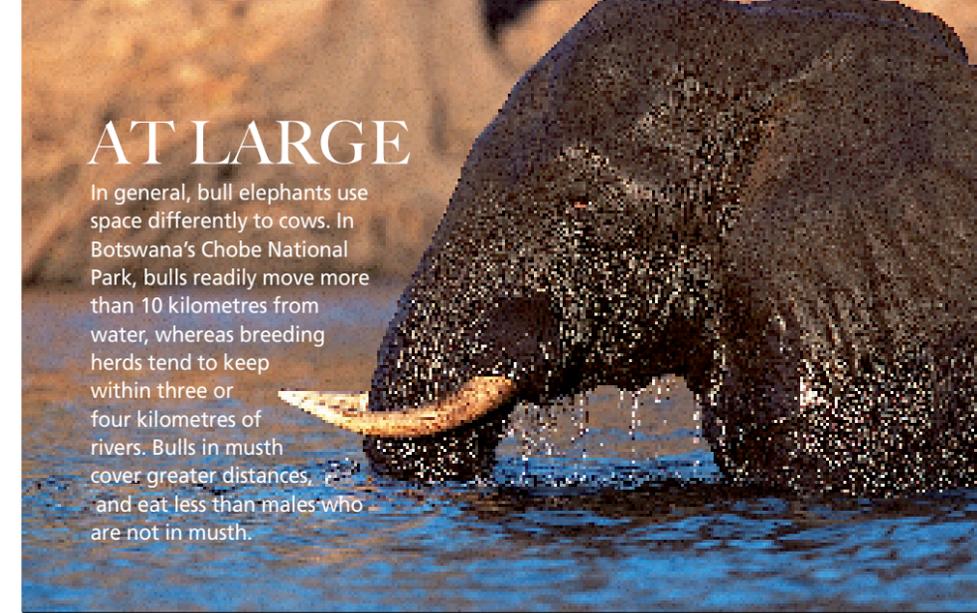
Studies by the Conservation Ecology Research Unit (CERU) at the University of Pretoria suggest that supplementing water supplies in this way reduces the home ranges of elephants. If elephants use smaller home ranges, then they must use them more intensely and this could increase the impact they have on vegetation. In the case of Kruger National Park, this is especially pertinent as during the 1980s and 1990s about 350 drinking places were maintained across the park. Although more research is required, it appears that this additional water has also caused dry- and wet-season ranges to overlap more than in other areas where elephants have been studied. This means there is no time for plants to recover.

Fences also challenge the way elephants use space. Small enclosed reserves prevent elephants from separating their dry- and wet-season ranges along traditional migratory routes (in fact many parks are smaller than the range of a free-roaming elephant). Larger protected areas – if they are the right shape – may allow for traditional migrations.

To conclude then, there is no such thing as 'one size fits all' as far as elephant ranges are concerned. It is little wonder that elephants confined to protected areas, which have either a lot of water points or do not encompass both dry- and wet-season ranges, will impact on vegetation.

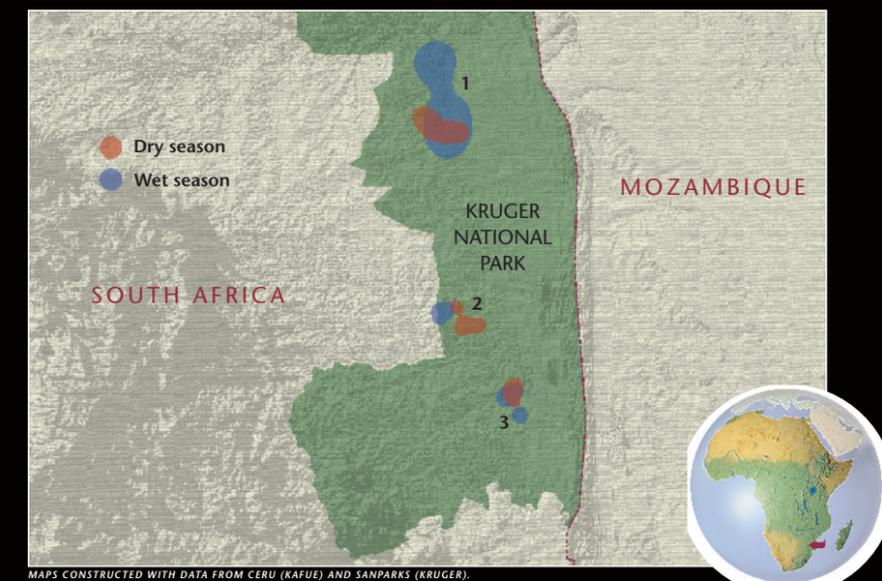
AT LARGE

In general, bull elephants use space differently to cows. In Botswana's Chobe National Park, bulls readily move more than 10 kilometres from water, whereas breeding herds tend to keep within three or four kilometres of rivers. Bulls in musth cover greater distances, and eat less than males who are not in musth.

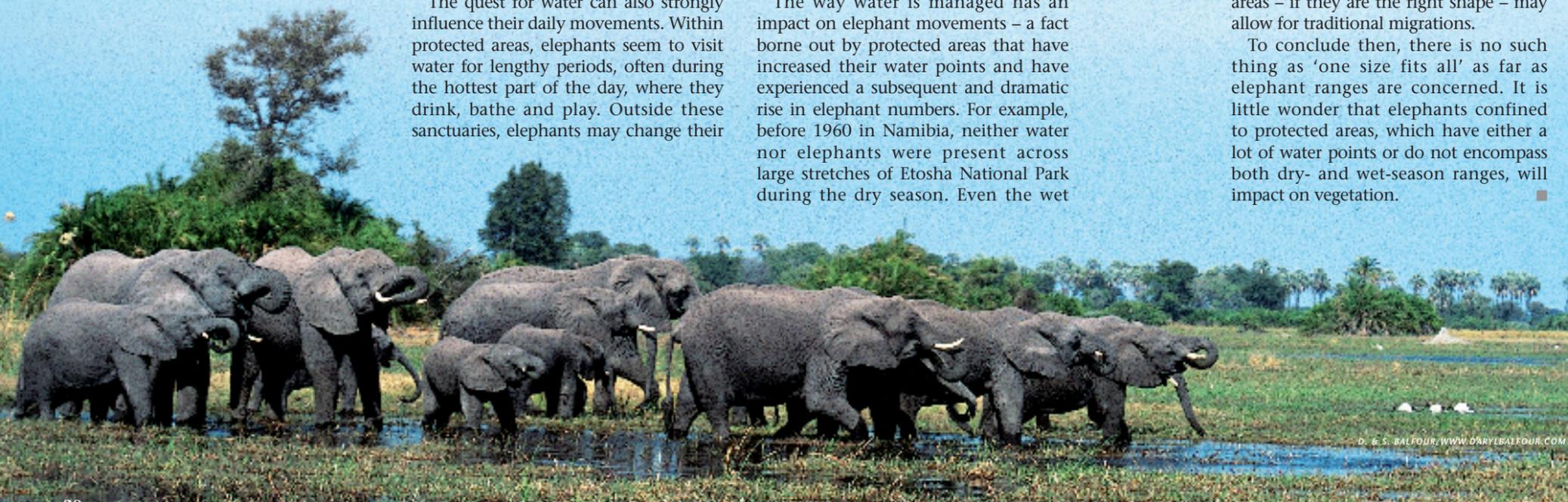


ABOVE A map of southern Kafue National Park, Zambia, showing satellite-tracked positions of an elephant during the wet (green) and dry (red) seasons. As with the movements of many other unfenced elephants, its ranges are clearly separated.

BELOW Data from three radio-tracked elephants in southern Kruger National Park during a wet and dry season. The core ranges overlap, which is probably a response to the distribution of water and fencing – aspects that need further study.



MAPS CONSTRUCTED WITH DATA FROM CERU (KAFUE) AND SANPARKS (KRUGER).



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