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MEDIA RELEASE

Fencing-in of Botswana elephants could explain why 350 elephants died in one area, reveals UP-led study

PRETORIA – An international study led by the University of Pretoria’s (UP) Professor Rudi van Aarde suggests that the mass die-off of 350 elephants in one area of northern Botswana last year, could be attributed to the fencing-in of these animals.

Prof van Aarde, Emeritus Professor of Zoology and Chair of Conservation Ecology (www.ceru.up.ac.za) at UP’s Faculty of Natural and Agricultural Sciences, said while the causes of the deaths are “still unknown and will never be known,” the fencing-in of these elephants in one area, and their relatively high densities, probably explain why the die-off occurred.

The study, published in *PeerJ – Life and Environment* (<https://peerj.com/articles/10686/>), suggests a “re-alignment or removal of fences that restrict elephant movements and limits year-round access to freshwater” is needed.

Botswana reported the death of 350 savannah elephants in May to June last year, sparking speculation among conservationists and the public around the cause. Carcasses were first found in the Okavango Panhandle region. Samples from the carcasses were tested by scientists in Zimbabwe, the USA, and at UP’s Faculty of Veterinary Science.

In September officials in Botswana indicated that cyanobacteria (toxic bacteria which can occur naturally in standing water and sometimes grow into large blooms known as blue-green algae) was the source of the deaths. However, Prof van Aarde said “restriction of freshwater supplies that force elephants to use pans as a water source possibly polluted by blue-green algae blooms is a possible cause, but as yet not supported by evidence.”

As part of his team’s long-running research programme, which considers regional elephant populations and their management, 10 elephants within the NG11 (an administrative district in northern Botswana where elephants and people share the land) were tracked using satellite tracking collars that were fitted on the elephants to map their movements, along with several hundred elephants in other areas across southern and eastern savanna Africa.

He explained that conditions for elephants in NG11 differ from those of non-confined elephants in the surrounding landscapes: “We show that NG11’s elephants are isolated by the Okavango River to the south-west and by fences on the other sides. NG11 imprisons the elephants, preventing their dispersal when numbers are high or when conditions may become harmful. The population growth rate within NG11 differs from those outside.”

The place in which the die-off occurred is not in a conservation area. Human-elephant conflict is high, leading to elephants avoiding the permanent freshwater sources along which people live, said Prof van Aarde.

The study argues that restricted elephant movements made this sudden die-off much more likely. “If a contagious agent were responsible, it would have implications for elephants beyond NG11 and neighbouring NG12, and the consequences of this are important for managing elephant populations across Africa.”

A team comprising UP and Pakistani scientists, including Prof van Aarde, deduced last year that malicious poisoning and poaching are unlikely to have played a role (<https://bioone.org/journals/african-journal-of-wildlife-research/volume-50/issue-1/056.050.0149/Mass-Die-Off-of-African-Elephants-in-Botswana--Pathogen/10.3957/056.050.0149.full>). Other species were unaffected, and elephant carcasses had their tusks intact.

“The apparent lack of fresh samples from carcasses and lockdowns of activities to contain the spread of COVID-19 add to the difficulties of establishing the cause of death. We may never have a definitive answer. Instead, the best we can do is to sketch the ecological aspects and setting of the affected area, its elephants, and its surroundings,” said Prof van Aarde.

Captions: Savanah elephants in northern Botswana, where 130 000 elephants live. Photo credit: Prof Rudi van Aarde

For more research on elephants by the University of Pretoria, please go to:

https://www.up.ac.za/research-matters/news/post_2707099-elephants-migrate-despite-protected-area-boundaries-and-international-borders

https://www.up.ac.za/research-matters/news/post_2459034-africas-protected-areas-have-only-a-quarter-of-the-elephants-they-should

https://www.up.ac.za/research-matters/news/post_2031009-learning-from-the-intelligence-and-emotion-of-elephants

Media enquiries

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ABOUT THE UNIVERSITY OF PRETORIA

The University of Pretoria (UP) is one of the largest contact and residential universities in South Africa, with its administration offices located on the Hatfield Campus, Pretoria. This 112-year-old institution is also the largest producer of research in South Africa.

Spread over seven campuses, it has nine faculties and a business school, the Gordon Institute of Business Science (GIBS). It is the only university in the country that has a Faculty of Veterinary Science which is ranked top in Africa, and overall has 120 academic departments, as well as 92 centres and institutes, accommodating more than 55 000 students and offering about 1 100 study programmes.

UP is one of the top five universities in South Africa, according to the 2019-2020 rankings by the Center for World University Rankings. It is also ranked among the top 100 universities worldwide in three fields of study (veterinary science, theology and law), and among the top 1% in eight fields of study (agricultural sciences,

clinical medicine, engineering, environment/ecology, immunology, microbiology, plant and animal sciences and social sciences).

In May 2020, the annual UK Financial Times Executive Education Rankings once again ranked GIBS as the top South African and African business school. The University also has an extensive community engagement programme with approximately 33 000 students involved in community upliftment. Furthermore, UP is building considerable capacities and strengths for the Fourth Industrial Revolution by preparing students for the world beyond university and offering work-readiness and entrepreneurship training to its students.

As one of South Africa's research-intensive universities, UP launched the Future Africa Campus in March 2019 as a hub for inter- and transdisciplinary research networks within UP and the global research community to maximise 4IR innovation and address the challenges and stresses our continent and world is facing. In addition UP also launched the Javett Art Centre in September 2019 as a driver of transdisciplinary research development between the Humanities and other faculties. In November 2020 UP launched Engineering 4.0. as a hub not only for Smart Cities and Transport, but also to link the vast resources in technology and data sciences to other faculties via Future Africa. These initiatives are stimulating new thinking at the frontier of 'science for transformation'.

For more information, go to www.up.ac.za