Room to Roam: Science-based solutions

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Photo: Jesse Maree / © IFAW

A visionary approach for elephants and people

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◀ The Lusaka Elephant Nursery herd bathing in the park as their keepers observe, Lusaka National Park, Zambia.

IFAW's Room to Roam initiative is a new and visionary approach to conservation. Backed by 20 years of science and fieldwork, it aims to ensure stable and persistent elephant populations long into the future—with little to no human interference.

Photo: Steven Ngomba / © IFAW

By connecting core elephant areas and securing these habitats, safe passages will be created for elephants and other wildlife to move freely within their home ranges in East and southern Africa. Such a 'connectivity conservation' approach will bring greater biodiversity, enhance landscape resilience to climate change, and create a future where animals and people can coexist and thrive.

Fragmented and degraded landscapes threaten migratory animals like elephants by preventing them from utilising critical segments of their home ranges both spatially and seasonally. At the same time, extreme weather events driven by climate change force elephants to roam well beyond protected areas in search of grazing grounds and accessible water sources. More than 330,000 elephants live and move within these increasingly fragmented landscapes.

What is needed now—and perhaps most importantly while there is still time—is a solution to this complex problem. Fortunately, science offers us a path. For the past 20 years, IFAW has worked with the University of Pretoria's Conservation Ecology Research Unit (CERU) to better understand elephant populations across Africa. This collaboration has led to IFAW's Room to Roam initiative, ensuring our approach to elephant conservation is based on robust and science-informed principles that strengthen credibility and guide strategies that deliver results. The scale and ambition of the initiative demands this, as well as a fresh take on continental-scale connectivity conservation, large-scale funding, and transformational outcomes that benefit people and nature.

Maintaining—or ideally increasing—connectivity benefits not only elephants but also supports other ecological processes that contribute to the overall resilience of the landscapes. Additionally, ecological connectivity can be integrated with other vital areas, such as those significant carbon sinks, providing multiple benefits for conservation and sustainable development across southern and East Africa. IFAW will continue to build on decades of science and field research to better understand the drivers of elephant population change and ecological dynamics over time and space. Such insights will help researchers accurately predict when and where population collapses could occur and respond with practical conservation and restoration solutions that ensure healthy and viable elephant populations.

IFAW cannot do this alone, so we call on scientists and other partners, including governments, research institutions, and communities, to collaborate for the immense task ahead. So, while we secure a 'habitat network' for elephants, collaborative networks of individuals, organisations, and communities must also be built and nurtured to help achieve the initiative's goals.

Room to Roam—driving benefits for entire ecosystems and people

Today, Africa's elephants roam across increasingly fragmented landscapes, often spending significant time in areas outside of formal protection. This exposes them to the threat of poaching and increases the likelihood of human-elephant conflict. Their compression into patches of protected land creates problems that must be solved. IFAW is committed to finding solutions informed and evaluated by science.

Wildlife has an inherent ability to adapt, resist, and recover from natural habitat disturbances. However, this ability is increasingly threatened by the rapid impacts of climate change, combined with human actions such as unsustainable extraction of resources, increasing infrastructure, and expanding agriculture.

For many decades, African conservation efforts have relied on external management and solutions with achievements primarily rooted in land set aside for conservation or regulations imposed to protect wildlife. Impressive conservation areas have been established across the savannahs, where a large variety of wildlife thrives. But, too often, these efforts are costly, temporary, or have come at the expense of communities living alongside wildlife.

To survive, elephants need connected landscapes and safe routes to roam freely through countries and over borders as they once did across the African continent. They must also be able to keep their distance from people. This means they need access to land where they are safe from exploitation and where they can find shelter, food, and water. With such natural space, populations will stabilise in number and recover from disturbances.

Elephants are the flagship species of Room to Roam, but the initiative drives benefits for entire ecosystems and the people living in and around them. The result is greater biodiversity, a natural resilience to climate change, and a future where animals and people can coexist and thrive.

Photo: Michael Zomer / © IFAW

▲ Tracking Jack the elephant's movement in Panda Masuie Forest Reserve.

330,000

savannah elephants remain in the Room to Roam landscapes of East and southern Africa.

30%

the decrease in Africa's elephant population in less than 10 years.

50 years

time in which the Kasungu elephant population could go extinct if not for the infusion of 263 recently translocated elephants.

Partners in science

Rudi van Aarde, our lead data consultant and Emeritus Professor at the University of Pretoria's zoology department, sadly passed away in 2023, but his legacy lives on. He led the most comprehensive elephant population-level research program ever conducted, which paved the way for Room to Roam.

Other key scientific partners in our Room to Roam initiative include: Professor Stuart Pimm, Doris Duke Chair of Conservation Ecology at Duke University's Nicholas School of Environment; and Professor Alfred Roca's team at the University of Illinois's Genomics Research Laboratory.

Elephants and their habitat face increasing threats

Today, the remaining 330,000 savannah elephants in our Room to Roam landscapes of East and southern Africa also spend time outside formally protected areas. This means they are traversing lands where people live, often coming into conflict with agricultural and other activities, which can impair people's livelihoods and quality of life.

From an ecological perspective, protected areas are sometimes constrained by one or more incompatible activities, such as infrastructure development, deforestation, mineral extraction, conflict, poaching, and other illegal uses of resources. Wars can devastate nature and wildlife as conflict zones become dangerous or lawless, displacing people and putting added pressure on already vulnerable ecosystems.

Compounding these issues are the increasingly pervasive effects of climate change and the fact that the human population in Africa is set to double by 2050, which will undoubtedly result in increased competition for resources.

Furthermore, the brutality of the crime syndicates fuelling poaching for ivory and other wildlife products keep driving elephant numbers into a downward spiral. Evidencing these destructive forces, the 2014 Great Elephant Census[2] confirmed a 30 percent decrease in Africa's elephant population in less than 10 years,[3] although the decline was mostly observed in forest elephants and across their range states.

The threat of fragmented landscapes

Some 1.4 billion people live on the African continent, which could nearly double by 2050[4]. Mega-infrastructure developments, including agriculture and mining expansion into wildlife habitats, fragment migratory pathways, thereby reducing the elephants' access to food and water sources. As a result, animals become restricted to wildlife 'islands' in a sea of people and their activities.

Fragmented landscapes perhaps have the most significant impact on migratory animals like elephants, preventing them from fully using their home ranges. Simultaneously, extreme weather, driven by climate change, increase the need for elephants to disperse more widely in search of food, water, and other elephants.

The long-term effects of climate change could shift the distribution of elephant populations across sub-Saharan Africa as they succumb to population declines in drier and hotter habitats while increasing and potentially thriving in wetter habitats. People will also seek out these more suitable agricultural lands, likely increasing the potential for human-wildlife conflict and biodiversity loss.

We need to move from a symptomatic to a solutions-based, forward-looking approach in addressing the threat of climate change. For this reason, advocating for, developing, and maintaining a network of connected savannah elephant landscapes across East and southern Africa is essential. Room to Roam encapsulates these imperatives.

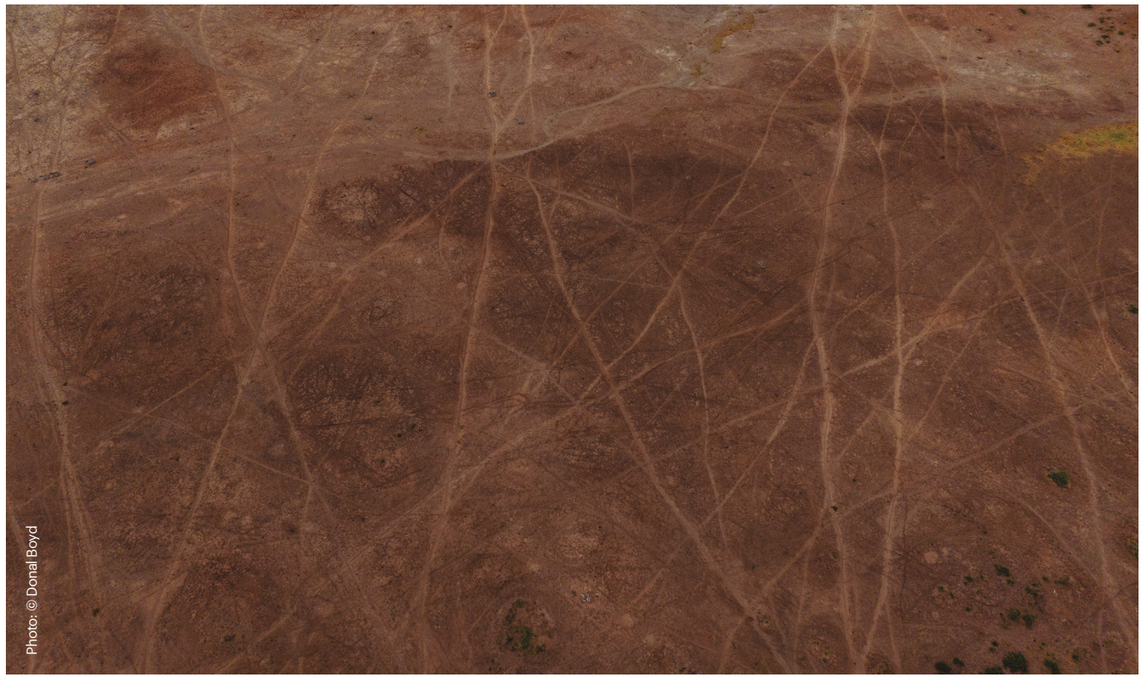


Photo: © Donal Boyd

▲ Dry landscape and animal paths, Amboseli National Park, Kenya.

Photo: Tyson Mayr / © IFAW

Photo: Michael Zorner / © IFAW

The constant threat of poaching

Overexploitation and habitat loss drive population declines and the likelihood of species extinctions, especially among threatened and endangered large mammals. Our recent assessment of elephant numbers across Africa shows that the 70 percent population deficit in 73 protected areas is due to poaching.[5]

Improved protection of conserved land is still the most critical immediate action to address this constant threat of poaching. This calls for effective management and large-scale financial resources to support wildlife protection. In addition, biodiversity credits are an emerging innovative, nature-based solution to address the threat of poaching and enhance effective protected area management.

1.4 billion

people live on the African continent, a number expected to nearly double by 2050.

70%

deficit in elephant population numbers in 73 protected areas due to poaching.

Photo: Luckmore Safuli / © IFAW

Photo: Michael Zorner / © IFAW

Understanding the drivers of elephant population dynamics

The Room to Roam initiative focuses on understanding the critical drivers of elephant populations and their habitats. Only with such insight can we develop effective conservation and restoration solutions.

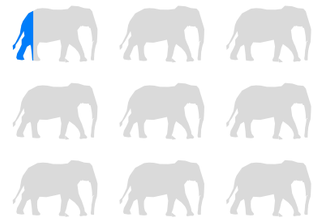
Populations of large mammals, such as elephants, are ecological linchpins. Declines in their numbers disrupt ecosystems and the services that they provide to people. To reverse this trend, we need a scientific understanding of why populations decline so we can accurately predict when and where collapses may occur. IFAW uses decades of science and field research to fully understand what drives change in elephant population numbers.

Disturbances such as culling, drought, and poaching all impact elephant population stability, albeit through different processes[7]. For example, when elephants are disturbed or stressed, they find strength in numbers and tend to form large herds. On the other hand, small herds may indicate their well-being, as elephants must feel safe and confident to move around as family groups.

Healthy, viable elephant populations must have proportionate age-sex structures that influence the reproductive and survival parameters of the entire population. IFAW uses the Rapid Elephant Population Assessment (REPA) method established by the University of Pretoria's CERU[8] to measure this and estimate accurate population growth rates. This makes for much faster and more accurate population studies—conventional randomised aerial censuses are more costly and generally less accurate due to observer subjectivity and experience, search intensity, and varying detectability[9]. Elephant population growth rates are more important than absolute population numbers because they tell us much more about a population's response to disturbance and/or management interventions.

More than 20 years of scientific research tells us that the survival rate of adult females has the most significant impact on population growth. We also know that the natural annual growth rate for a stable elephant population is between 0% and 2%, while the maximum biological growth rate is 5.2%. Anything above that is likely a result of human manipulation, such as artificial water supply or fencing.

For example, this science has guided us in restoring the elephant population in Kasungu National Park, Malawi. Here, our modelling revealed that the Kasungu population (current growth rate from –7% to 0%) might have gone extinct within 50 years without the infusion in July 2022 of 263 elephants translocated from another overpopulated park in Malawi.



0-2%

the natural annual growth rate for a stable elephant population.

5.2%

the maximum biological growth rate.

-7%

the direct estimation of annual growth rate of the population of elephants in Kasungu National Park, Malawi

Photo: Naudé Heunis / © IFAW

Elephants are allies in our shared fight against climate change

Photo: © Rudi van Aarde

The elephant is the flagship of our Room to Roam initiative because of its vast contribution to Africa's biodiversity and climate resilience.

Studies show that up to a third of carbon mitigation needed to each the Paris Agreement targets can be met by nature conservation alone[10]. Over more than 20 years, we've learned a lot about elephants — not only their behaviour patterns and their dispersal routes, but also their role as guardians of Africa's landscapes and their contribution to other species of plants and animals.

For example, when large herbivores like elephants feed, they disperse seeds, clear vegetation, and fertilise the soil, helping to build more complex and more resilient ecosystems. These activities can maintain and increase carbon stocks in the soil, roots, and above-ground parts of plants, helping reduce CO2 in atmosphere[11].

Furthermore, as elephants move through landscapes, they thin out trees competing for light, opening the woodland canopy and encouraging new growth below. The remaining trees may grow taller and larger, allowing them to store more carbon as they mature.

Wildfires release carbon stored in trees and vegetation as greenhouse gases. Elephants, rhinoceroses, zebras, and other large grazing animals can lessen wildfire risk by browsing on woody vegetation that could otherwise fuel the fires, trampling paths, and making other gaps in vegetation that act as firebreaks[12]. They also clear bushes, keeping plains open and healthy rather than overgrown. In addition, by breaking down branches as they walk, elephants help to lower food sources that might otherwise have remained beyond the reach of other species.

Elephants also dig wells, especially on riverbeds, using their feet, trunks, and tusks to create holes deep enough to tap into underground water. These watering holes are then available for other animals as well. Studies have demonstrated a link in seasonal wetlands between elephant fertilisation of the land and increased fish abundance and size in rivers[13].

Finally, savannahs are also home to big cat species such as lions, cheetahs, and leopards, and these apex predators are crucial to maintaining the balance of all species across the continent.

The power of connectivity

Protecting, restoring, and connecting elephant habitats locally, regionally, and continentally would facilitate elephant movement, increase genetic diversity, and assure that African countries meet conservation targets. Habitat connectivity would also protect other species and preserve ecosystem functions and services.

This justifies our actions to promote and improve elephants' connectivity across southern and East Africa's savannahs. A viable elephant population needs space where enough individuals can live without negative impact from human interference. For example, maintaining a minimum viable population of 1,000 elephants may require an effective area of at least 2,500 square kilometers or more, depending on rainfall and the distribution of drinking water[17].

However, the possibilities to expand conserved and protected land are limited, so improving the effectiveness of available land is a more realistic approach. This can be achieved by:

- opening natural linkages across human-dominated landscapes to connect small areas, building ecologically functional units
- extending core conserved areas into surrounding buffer zones

Both options focus on connectivity, a nature-based solution that should improve the ability of species' populations to withstand or recover from disturbances. However, when applying connectivity as a conservation approach, we need to identify threats that elephant populations experience now and in the future.

Connectivity promotes elephant population stability, which, in turn, increases population resilience. Resilience is becoming increasingly important due to the climate change challenges the species is facing.

Connectivity conservation

Room to Roam aligns with the science of connectivity conservation to establish and restore structural and functional linkages among and between protected areas, other effective area-based conservation measures (OECMs), and additional intact ecosystems. The vision builds on existing conservation clusters provided by the Transfrontier Conservation Areas (TFCA) agenda and on recent IUCN Connectivity Conservation Guidelines. It also aims to proactively identify, secure, and extend additional habitat in response to the changing climate and human development pressures. Using elephants as a flagship species, Room to Roam focuses on maintaining and/or restoring connected landscapes defined by the ecological needs of large mammals, not simply by political delineations.

Linking anchor landscapes

Anchor landscapes are strongholds of biodiversity and places where the outcomes and dividends of past and present conservation activities are impressive and essential. These geographical spaces also create room for elephants to roam.

Room to Roam is founded on a portfolio of these large, anchor landscapes, where the focus is maintaining elephants as flagship species in the ecosystem. Our framework incorporates 10 elephant landscapes with an initial focus on the following four landscapes that are strategically positioned for cross-regional connectivity from East to southern Africa:

- the Greater Hwange Elephant Landscape in Zimbabwe
- the Southern Rangelands Elephant Landscape in Kenya
- the Malawi-Zambia Elephant Landscape
- the Zambezi Elephant Landscape in Zambia

IFAW's ongoing research to map and understand elephant populations and how they roam will continue to improve connectivity.

For example, we will add layers of detail to satellite tracking data with variables such as rainfall, vegetation type, temperature, distance from crops, and distance from human settlements. Furthermore, we will layer this input with land use and land cover variables such as projected human population densities, areas of interest for mineral extraction, and regions likely to be most impacted by climate change. These insights will help us map out what connected landscapes could look like, guiding us to identify valuable linkages and where we need to do more to restore and maintain connectivity.

In addition, we will continue an in-depth analysis of the genetic structure of elephant populations across the landscape to understand how different populations are related.

Photo: Naude Heunis / © IFAW

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