



## CARNIVORE PROGRAMME

Welcome to *The Conservation Science Spotlight*



Stumpy tail and two of her cubs in the Greater Kafue Ecosystem. Long-term studies of lions in the Kafue have evaluated increased protection efforts and demonstrated positive impacts on lions, most notably with cub production.

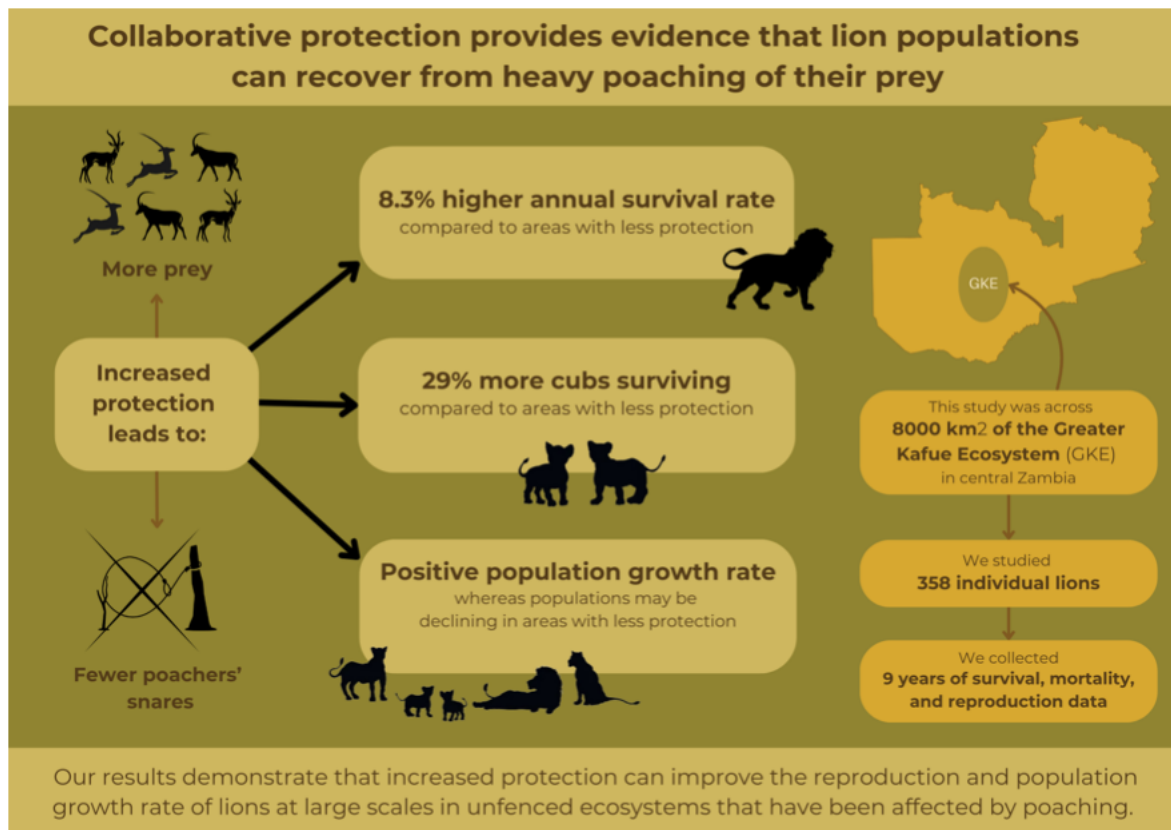
**Study shows how increased protection drives lion population recovery in Zambia's Greater Kafue Ecosystem**

The vast wilderness of Zambia's Greater Kafue Ecosystem (GKE) is home to Zambia's second-largest populations of lions, wild dogs, leopards and spotted hyenas, and its largest population of cheetahs. It also forms the remote northern frontier of the Kavango- Zambezi (KAZA) Transfrontier Protected Area.

Lioness-1386, affectionately known as "Stumpy Tail" is the matriarch of Mawimbi Pride and lies with a full belly bathing in the soft glow of dawn. She and the family are feeding on the remains of last night's hunt. Stumpy's two subadult daughters rest in the shade of a small miombo tree, and around them four young, plump cubs nurse and play. But times were not always this good; for many years, poaching had depleted most of the antelope prey that the lions depend on, and as a result mothers had to range far and wide to find enough food to feed their growing cubs. Consequently, lionesses were often unsuccessful in raising cubs, or did not breed at all given the lack of available food.

Across Africa, prey depletion from bushmeat poaching, largely with wire snares is one of the biggest threats to populations of large carnivores and their prey, but surprisingly little is known about how it actually impacts lion populations. And while resource protection - in the form of anti-poaching efforts - is a key intervention to prevent the loss of prey, the effectiveness of such interventions had not been measured until now. Can increases in protection efforts effectively reverse the impacts of prey depletion in vast, unfenced wild areas that are critical to the future of Africa's lions?

A new study led by ZCP, the Zambia Department of National Parks and Wildlife (DNPW), Musekese Conservation, and Greater Kafue Landscape Limited (GKLL) reveals significant increases in African lion (*Panthera leo*) populations once effective protection measures are put in place, even in areas that are heavily impacted by prey depletion. Our research highlights how anti-poaching measures caused a large increase in lion cub survival to adulthood within Zambia's Kafue Ecosystem, switching the population from decline to growth.



It is estimated by the IUCN that there are only 23,000 lions left in the wild, mainly found in Sub-Saharan Africa and some small populations in West Africa and India, having been made extinct from almost 30 countries where they used to roam free.

Their decline can be attributed to a combination of bushmeat poaching, habitat loss, conflict with humans and livestock and trafficking of skins and parts. Government agencies, international and local conservation organisations, and local communities are trying different ways to reverse this decline across Africa, but there has been much debate about whether it is even possible in large, unfenced areas.

The new study, spanning from 2013 to 2021, was conducted both before and after a systematic increase in wildlife protection was implemented, allowing for a direct test of the impact of the increased protection. The research involved intensive monitoring of all lions in the study area. This was facilitated through radio collars on at least one individual in each pride and by an intensive field effort to build a long-term database of photos that identified every lion, recorded who lived and died, who had cubs, and who dispersed to a different group. The team then used cutting-edge methodology with an 'integrated population model' that combined data on survival and reproduction for 358 lions, including Stumpy and the Mawimbi pride, across zones with varying levels of protection.

Results demonstrated a 29% increase in lion reproduction, meaning that the number of cubs raised to one year old per pride increased substantially in areas with

intensified protection efforts such as targeted anti-poaching patrols and reduced wire snaring activities. For all lions there was an 8.3% improvement in annual survival rates in these high-protection zones, resulting in an annual lion population growth rate of 8.5%. In areas of high protection, this growth rate would allow the lion population double within a decade.

However, lions are still faring poorly in areas with lower protection, primarily due to low survival of cubs, showing the urgent need for expanded and sustained conservation efforts. Population growth in well protected areas is offset by areas that did not receive increased protection from poaching. While overall the population showed stability, recovery will require broader implementation of anti-poaching measures and increased investment in conservation to recover prey and lions. The newly-signed 20-year management agreement between the Government of Zambia and African Parks to form the GKLL for Kafue National Park provides the resources to accomplish this. Poaching increases when there are problems such as food insecurity and poverty, so sustainable solutions must include community engagement, community conservation models to increase benefits from wildlife-based economies, as well as alternative livelihoods and protein sources while at the same time deterring poaching and trafficking. Improved community conservation partnership models in the areas surround Kafue National Park are under development between the Government of Zambia, The Nature Conservancy, and partners and will help facilitate lion recovery outside of national parks as they recover inside them.

This research emphasises the critical role of protection in effectively reversing prey depletion and supporting lion population growth in the large, unfenced ecosystems that characterise Africa's remaining lion strongholds. By focusing resources on areas with the highest poaching pressure, there can be large, concrete strides towards lion population recovery, as seen with Stumpy and her cubs. Lions are dominant carnivores, and with a lack of prey in the ecosystems, this also puts pressure on subordinate carnivores such as African wild dogs, hyenas, cheetahs and leopards. Increased protection not only safeguards lions and their prey, but other large carnivores too.

Access the study here:

[Read the study](#)

The study was conducted by Zambian Carnivore Programme and the Zambia Department of National Parks and Wildlife, Musekese Conservation, Greater Kafue Landscape Limited and other collaborators.

*The Conservation Science Spotlight is an initiative aimed at sharing clear and concise summaries of recent scientific studies conducted by ZCP and partners. Its purpose is*

*to make technical research more accessible to the public and stakeholders, emphasising the studies' relevance to conservation efforts in Zambia.*

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