

Within the past week, Thailand officials seized seven tons of ivory, representing the slaughter of hundreds of African elephants for illegal trade. While recent reports say that poaching far exceeds population growth, some conservation groups contend that population growth in some regions compensates for poaching losses in others, despite the fact that each area is populated by a different species of African elephant.

"By not recognizing two species, these organizations may be condemning the African forest elephant to extinction," said University of Illinois Animal Sciences Professor Alfred Roca, who co-authored the recent literature review "Elephant Natural History: A Genomic Perspective." Roca is also a member of the Carl R. Woese Institute for Genomic Biology.

"The two African elephants diverged about six million years ago," said Roca, a leading expert in the genetic differences between the two species. "It's like saying, 'We increased the lion population, which will more than make up for the fact that tigers are going extinct.'"

To put that six-million-year difference in perspective, humans and chimps diverged about the same time (some experts estimate six to eight million years ago), while humans and Neanderthals split just half to three quarters of a million years ago.

Citing a need to protect hybrids and encompass all populations, the International Union for Conservation of Nature (IUCN) recognizes one species of African elephant (*Loxodonta africana*), which is listed as vulnerable. Yet the IUCN goes on to imply that [population growth](#) in Eastern and Southern Africa outweighs losses in Central Africa:

"Although elephant populations may at present be declining in parts of their range, major populations in Eastern and Southern Africa, accounting for over two thirds of all known elephants on the continent,

have been surveyed, and are currently increasing at an average annual rate of 4.0% per annum (Blanc et al. 2005, 2007). As a result, more than 15,000 elephants are estimated to have been recruited into the population in 2006 and, if current rates of increase continue, the number of elephants born in these populations between 2005 and 2010 will be larger than the currently estimated total number of elephants in Central and West Africa combined. In other words, the magnitude of ongoing increases in Southern and Eastern Africa are likely to outweigh the magnitude of any likely declines in the other two regions." ([IUCN Red List account of *Loxodonta africana*](#))

"They are not recognizing the forest elephant as a separate species despite all the research that has definitively established this," said Roca, referring to 15 years of genetic and morphological (physical) studies that have confirmed that there are two species of African elephants, dozens of which are cited in the literature review.

"Many other conservation groups do not differentiate between the two species," said Ronald Nowak, author of Walker's Mammals of the World, which will include the two species in the next edition. "The species are not shown as separate entities on the official United States List of Endangered and Threatened Wildlife or on the appendices to the Convention on International Trade in Endangered Species (CITES)."

Today experts recognize African savanna elephants, or *Loxodonta africana*, which are found in Eastern and Southern Africa, and African forest elephants, or *Loxodonta cyclotis*, which are found in Central and West Africa where poaching pressures are the most severe.

"To my knowledge, all the evidence, now a very large amount, supports two species, and no evidence supports one or more than two species," said Nick Georgiadis, a co-author of the review, and research scientist at the Puget Sound Institute. "And it's not as if the DNA evidence

contradicted prior non-DNA evidence. There never was any objective evidence supporting one species, just a few subjective preferences that became dogma."

The review's authors argue that the two species of African elephants must be "treated as distinct units for conservation" and go on to discuss how genetics can influence conservation, including the use of DNA forensics to trace the origin of confiscated ivory.

More than 20,000 African elephants are killed every year for their ivory, according to an analysis by CITES MIKE Program (Monitoring the Illegal Killing of Elephants). In the last decade, one study has shown that Central Africa has lost 62 percent of its elephants; that's more than half of the forest elephant species.

"While the IUCN continues to recognize only one [species](#), such deep genetic divergence makes it very easy to distinguish forest from savanna elephant ivory," said Georgiadis.

Researchers use DNA forensics to help conservation and law officials understand the strategies used to smuggle ivory across borders to black markets in Asian countries, including Thailand, Vietnam and China. Officials can use this knowledge to allocate limited funds for interventions in areas under poaching pressure or along the trade route.

"But until China and other countries do something to crack down on the ivory trade," Roca said, "all the forensics in the world aren't going to stop [elephants](#) from being poached."

More information: "Elephant Natural History: A Genomic Perspective," [DOI: 10.1146/annurev-animal-022114-110838](https://doi.org/10.1146/annurev-animal-022114-110838)

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