[crickets]

[footsteps]

[cymbal plays]

[chime]

[elephant sounds]

[SHANE CAMPBELL-STATON] Normally, more than 90% of female African elephants have tusks. But in places that have a history of poaching and trophy hunting, like in Gorongosa National Park, tuskless females are surprisingly common. Despite this tragedy, we have a unique opportunity to show how humans are impacting the evolution of animals in their natural habitat.

In a situation where individuals are being actively hunted for their tusks, not having those tusks puts you at an advantage, and if you're less likely to be killed then you're more likely to pass those tuskless genes on to the next generation. This is the basic process of natural selection.

[music plays]

[CAMPBELL-STATON] To better understand how the tuskless trait is evolving under selection from poaching, we want to find out which genes are responsible for tusk development. But elephants have thousands of genes. So how do we find the right ones?

Tusks themselves are modified teeth.

Because all mammals generally share the same genetic program for building teeth, we looked at the genes involved in tooth development for a species we know a lot about: humans.

Within humans there are about 300 genes that are generally involved in tooth development. I mean, it's still a lot of genes, but it also kind of narrows the scope if you're considering an entire genome. The elephant counterpart to at least some of these genes are most likely also involved in tusk development.

[music plays]

[helicopter rotor]

[CAMPBELL-STATON] So far, we've collected blood samples from several elephants in Gorongosa to isolate their DNA. Once we get those samples back into the lab, we'll sequence them and look for differences in the DNA sequences of females with tusks and females without tusks.

Because we're looking within the same population, most of the genome should be relatively similar except at those regions of the genome that are specifically involved in the trait differences that we're interested in. So if we pick up any differences in this elephant population that happen to coincide with genes that we know are involved in tooth development, that is kind of a smoking gun.

Once we find them, we can ask, how is the prevalence of these DNA differences, or alleles, changing in elephant populations that are experiencing poaching?

Evolution is a process that has been happening for a very long time, but it's also something that is happening now, right now, in and around us, and we are a major driver of that process.

[music plays]

[CAMPBELL-STATON] Before this project, I had never been to Africa. Obviously, you know, for me that was…it's a very special thing to go back to the motherland, and this project, I can honestly say, has been the most astounding experience of my life in a lot of ways.

Working with elephants is something special and…just, like, the grand scale of the creature. We tranquilized this female, and as we were collecting data, Dominique, one of the scientists, she identified the individual. This female was 65 years old. Right? I mean, she's older than my mother.

Nine out of 10 of the individuals in her species died during a 15-year period, and she survived that event, became the matriarch of a herd, leading a family, had children, had grandchildren, and there she is, in all her thousands of pounds of glory, you know?

It's hard to explain, to be able to interact with an animal that has experienced so much. That, to me, is really special.

[music plays]