

# Mountain gorilla population growth related to group density and female movements

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Female mountain gorillas with offspring. Credit: Dian Fossey Gorilla Fund International

New research from the Dian Fossey Gorilla Fund, just published in the journal *Animal Conservation*, analyzes more than 50 years of demographic data to examine factors influencing variability in the growth rate of the mountain gorilla population and what this may mean for their future conservation.

Mountain gorillas are a rare [conservation](#) success story. The subspecies was on the verge of extinction in the [early 1980s](#) but through long-term investment by the governments of Rwanda, Uganda and the Democratic Republic of the Congo as well as conservation organizations like the Dian Fossey Gorilla Fund, they are currently the only great ape whose numbers are increasing. But with approximately 1,000 individuals left, they remain a highly conservation-dependent subspecies.

As shown in this and previous studies, the mountain gorilla population in Rwanda began a slow recovery in the mid-1980s, demonstrating the benefits of strengthened conservation practices, which included anti-poaching patrols, daily monitoring, the economic benefits of ecotourism, community engagement and veterinary care. This allowed the subpopulation monitored by the Fossey Fund to grow at relatively high rates from the 1980s through the mid-2000s.

"Historically, as a result of the poaching and habitat disturbance in the 1970s and early 1980s, the mountain gorilla group density was low in the area of the Volcanoes National Park where the Fossey Fund works," says Felix Ndagijimana, Rwanda program director for the Dian Fossey Gorilla Fund and one of the study's authors. "Groups interacted infrequently, maybe every other month, and there was stability in group leadership. One of the groups we monitor grew to 65 individuals, which is six times larger than the average mountain gorilla group."

## **Group stability starts to decrease**

In 2007, this group stability started to change, as these now very large groups began to split from each other.

"The group density tripled in the space of only two years, as [young males](#) left to form their own groups," says Ndagijimana.

This increase led to more spatial overlap and group interactions. Such interactions range from tolerant to highly aggressive, and this aggression can even be lethal.

An earlier study by the Fossey Fund revealed that these increased interaction rates resulted in higher male and [infant mortality](#), contributing to a significant slowing of the population growth rate. However, the authors reported that mortality alone did not explain this pattern.

In the study now published in *Animal Conservation*, further analysis by the Fossey Fund team revealed that changes in female reproduction also played a role. The increase in intergroup encounters gave females more opportunities to move between groups.

But these moves were associated with delays in reproduction, specifically the period between successful births. Infants are usually born about four years apart but females changing groups one time extended this interval by nearly eight months, while females changing groups multiple times led to an 18-month extension.

"Female choice of which group to live in is an important part of gorilla life history but is limited to when groups interact with each other. Historically, the low rates of group interactions meant that females had relatively few opportunities to move, as they generally only transfer when they are not pregnant or don't have a dependent offspring. The significant increase in group interactions provided us with the first

opportunity to study the implications of females changing groups multiple times," says Robin Morrison, Ph.D., postdoctoral researcher at the Dian Fossey Gorilla Fund and lead author on the paper.

"Our study shows that female movement patterns and their reproductive consequences follow broader trends driven by social dynamics across the population. It adds to our growing understanding of how [social dynamics](#) can impact conservation, particularly when groups are living at a high density," Morrison says.

## Groups begin to spread out

Fortunately, over the last several years, the groups have been able to spread out, suggesting this period of group instability, high mortality and slowed reproduction may be coming to an end.

"We are already beginning to see infant mortality as well as female transfer rates return to what was more typical in the 1980s and 1990s," says Morrison.

However, the results underscore the challenges facing the population as it continues to grow within a limited habitat.

"The [mountain gorillas](#) of Rwanda are one of the longest-studied animals on the planet, and this research really emphasizes the value of such an investment to understanding big-picture questions about the population," says Tara Stoinski, Ph.D., the Fossey Fund's president and CEO/chief scientific officer and an author on the paper.

"We often think of extrinsic conservation threats, such as [climate change](#), poaching or habitat loss, but these data highlight some of the intrinsic challenges species may face as habitat shrinks. This is critical information that can help inform longer-term conservation strategies to

ensure the continued growth of the population."

**More information:** Tara Stoinski et al, Cascading effects of social dynamics on the reproduction, survival, and population growth of mountain gorillas, *Animal Conservation* (2022). [DOI: 10.1111/acv.12830](https://doi.org/10.1111/acv.12830)

Provided by Dian Fossey Gorilla Fund International

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