

Here's What Might Happen to Local Ecosystems If All the Rhinos Disappear

African landscapes may become very different places if rhinos aren't there to diversify plant life and create prime grazing spots for other animals

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Some large animals influence their surroundings more than others. Elephants are known as ecosystem engineers for their tendency to push over trees and stomp shrubby areas in the savannah into submission. This keeps forests at bay, which otherwise would overtake open grasslands. Wolves, on the other hand, are apex predators. They keep other species like deer in check, preventing herbivore populations from getting out of hand and eating all the plants into oblivion. Both elephants and wolves are keystone species, or ones that have a relatively large impact on their environment in relation to their actual population numbers.

African rhinos, it turns out, also seem to be a keystone species. According to a recent study published by Scandinavian and South African researchers in the *Journal of Ecology*, rhinos maintain the diverse African grasslands on which countless other species depend.

Surprisingly, prior to this study no one had looked closely at rhinos' roles in shaping the ecosystem. Most researchers focused on elephants instead. Suspecting that these large animals influence their environment, the authors took a close look at rhinos in Kruger National Park in South Africa.

Today, around 10,500 white rhino live in the park, but that was not always the case. In 1896, rhinos went extinct there due to overzealous trophy hunting. In the 1960s, conservationists began reintroducing the animals back into the park. The population rebounded over the decades, although the rhinos haven't distributed themselves around the 7,500-square mile area equally. As a result, Kruger acts as a sort of "well-documented natural experiment," the researchers write, showing what happens when an animal is excluded from and then put back into an environment.

The authors first examined a 30-year aerial survey record (beginning in 1980) of where the rhinos did and did not live around Kruger. This record also showed how rhino distributions varied over time as they slowly expanded into new areas. So, by studying these surveys, the researchers could identify and compare places where rhinos had inhabited the longest or the shortest.

After pinpointing high- and low-density sites, the authors went into the field and recorded the plant species found along 40 sections of the park, totaling just under 20 miles. They built a statistical model to analyze the results and controlled for factors such as soil content and the presence of other large grazers, including impala, warthog and wildebeest.

The places where the fewest rhinos lived, they found, had 60 to 80 percent less short grass cover than places where rhinos frequently hung out. "Short grass" is a catch-all metric commonly used to approximate plant diversity in grassy areas in Africa, referring to a number of munchable species. Rhino-inhabited areas also had about 20 times more grazing lawns, or patches where specific grass species grow that are prime eating for not only rhinos but also smaller grazing animals such as zebra, gazelle and antelope.

Based on these findings, the authors think that the rhinos are probably playing a role in controlling the make-up of the

park's grasslands. Rhinos, like other grazing species, selectively browse on certain grass species, which leaves room for others that otherwise could not compete to move in and promotes a diverse mosaic of edible plants. As a science writer for the University of Washington put it, "Think of them less as lawnmowers and more as...selective lawnmowers."

Rhinos have only been around the park for a relatively short amount of time, so future studies will have to confirm whether their presence leads to even more substantial ecosystem changes. Examining other places in Africa will also help confirm whether or not rhinos have the same influence wherever they go.

Rhinos are one of the few megaherbivores—plant-eaters that weigh more than 2,000 pounds—that still live in the world. Most others have long gone extinct, many of which were victims to human hunting and expansion. Rhinos' continued existence, however, is questionable. Poachers killed nearly 1,000 rhinos in South Africa alone last year—an almost 50 percent increase from 2012—so as things now stand, rhinos may very likely go the way of so many other species before them.

If the rhinos do disappear from Africa, the authors warn, the savannah will likely become a distinctly different place—in addition to an emptier one.

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