Research shows cattle ranching could help conserve rare African antelope, lions

May 3 2019

Researcher Caroline Ng'weno and a colleague monitor the temperature of a lion on the Ol Pejeta Conservancy in central Kenya during her research on the interaction of lions with Jackson's hartebeest, other wild ungulates and cattle. Credit: Douglas Kamaru

Endangered African antelope and the lions that prey on them may

benefit from certain cattle ranching practices in Kenya, according to newly published research led by a 2017 University of Wyoming Ph.D. graduate.

Caroline Ng'weno, who conducted the research during her UW graduate studies, is one of the first—if not the first—Kenyan women to have earned a Ph.D. working as a field biologist in Kenya. Ng'weno now heads the Pride of Meru program for the Born Free Foundation, an organization dedicated to research and protection of lions in central Kenya. Her work has provided new insights into the interaction among Jackson's hartebeest, a species of conservation concern; other wild ungulates; cattle; and lions in Kenya's Ol Pejeta Conservancy, which is managed for both wildlife conservation and cattle ranching.

As detailed in the scientific journals *Ecology and Frontiers in Ecology and Evolution*, Jackson's hartebeest—a large antelope that can weigh over 400 pounds—has been in significant decline in that part of Kenya since the reintroduction of lions in the late 1980s. That's primarily because hartebeest share savanna habitat with zebras, the primary prey of the approximately 70 lions comprising five prides in the conservancy.

"Predation risk for hartebeest was elevated in association with zebra, implying that apparent competition with zebra may negatively impact hartebeest populations," Ng'weno and fellow researchers wrote in Ecology. That's in line with previous research that shows secondary prey such as hartebeest can suffer significant population declines when large carnivores are restored to an ecosystem after a long absence.

Restoration of lions to the Ol Pejeta Conservancy and elsewhere in central Kenya resulted from greater tolerance by ranch managers, following decades of shooting and poisoning of the top predators. That's because ranch managers are increasingly recognizing that tourism resulting from abundant wildlife populations can help them sustain their

livestock operations in drought years and other lean times. However, the decline of hartebeest numbers has led some ranch managers to considering reimplementing lethal control of lions.

According to Ng'weno's research, the ranchers could hold the key to maintaining both the lion and hartebeest populations.

It turns out that abandoned cattle corrals create nutrient hotspots called glades that attract zebras, and therefore lions—but not hartebeest. And the researchers showed that survival of hartebeest in areas without glades was more than twice as high as in areas with glades.

So, ranch managers' placement of cattle corrals away from hartebeest likely would allow the antelope species to increase, with lions focused on the zebras that congregate at the resulting glades.

"In our study system, spatial separation between zebra and hartebeest improved survival rates of hartebeest, probably by reducing encounters with lions hunting in areas with high zebra densities," they wrote. "Strategic placement of glades, therefore, offers a promising approach to creating refuges for hartebeest and perhaps other species of secondary prey."

While some might argue that eliminating glades through reduction of cattle production might be an option for hartebeest conservation, the researchers say that's not practical. That's because ranchers are unlikely to reduce cattle numbers voluntarily; and reducing cattle numbers would likely boost zebra numbers, along with lions, as cattle and zebra diets overlap. The researchers note that predation by lions on cattle is rare compared to predation on zebras.

"Alternative conservation interventions are required for the long-term persistence of lions and their prey not only on Ol Pejeta Conservancy,

but more widely in (Kenya's) Laikipia County and the whole of sub-Saharan Africa," they wrote.

The research involved capturing and placing GPS collars on lions in five different prides representing 70 individuals; identification and tracking of 179 hartebeest; and analysis of 246 sites where lions killed animals. The scientists also studied lion predation on buffalo, zebras, impala and warthogs. Notably, they found that the proximity of buffalo to zebras reduced the risk of predation on buffalo, contrary to the relative risk for hartebeest.

More information: Caroline C. Ng'weno et al, Apparent Competition, Lion Predation, and Managed Livestock Grazing: Can Conservation Value Be Enhanced?, *Frontiers in Ecology and Evolution* (2019). DOI: 10.3389/fevo.2019.00123

Provided by University of Wyoming