



UW College of Agriculture and Natural Resources
Global Perspectives Grant Program
Project Report Instructions

A brief written report must be submitted electronically to the AES office **within one month of returning from your trip**. Photographs supplementing the report are encouraged and are appreciated by the donor. Failure to submit a report may jeopardize future funding from AES.

In addition to forwarding these reports to our benefactor, reports will also be published on the AES website—do not include any photos that require permission to post to our webpage. Reports must be written in a style **understandable by the lay person** and may be edited for readability before being published to the AES website or the University of Wyoming Foundation report.

Format: Use 12 point type, single line spacing, and one inch margins. Submit your report to aes@uwyo.edu as a single PDF file.

Include the following information:

1. COVER PAGE

Trip Date: February/March 2023

Principle Investigator(s): Jake Goheen **Department:** Zoology & Physiology

Email: jgoheen@uwyo.edu

Project Title from Application: Compatibility of livestock and wildlife in human-occupied rangelands: using cattle to conserve lions and their prey

Non-technical summary (max 1500 characters plus spaces): Provide a one paragraph non-technical summary that most people can understand.

My work is focused on uncovering science-based, practical solutions through which ranchers, pastoralists, and their livestock can coexist with African lions. In collaboration with graduate students in our lab, that work is carried out on the Laikipia Plateau of central Kenya, and the Greater Tsavo Ecosystem of southern Kenya and northern Tanzania. In February/March 2023, and with the support of the Global Perspectives Grant Program, we (1) initiated a de-snaring campaign in Tsavo National Park (to remove illegal snares and gauge the efficacy of snare removal in boosting the prey base for Tsavo lions); (2) continued a rotation scheme for cattle using lion-proof corrals at Ol Pejeta Conservancy in Laikipia (to change the distribution of zebra on landscapes, and a means to reduce livestock losses to lions); and (3) finished fieldwork for a study describing how invasion of big-headed ants to Laikipia has caused lions to switch from eating zebra to buffalo.

2. REPORT: Maximum of two pages of text; in addition, please also include **photos**. Must be written in a style understandable by a general audience.

Include:

1. Accomplishments: *Initiation of a de-snaring program in and around Tsavo National Park.* Despite being categorized as one of four lion conservation strongholds in East Africa, Tsavo National Park houses only roughly 400 lions, or 1/10th the number of lions as comparably-sized protected areas. However, after accounting for variation in prey (zebra, warthog, buffalo, various antelopes) density, lion numbers are slightly *above* what would be expected from comparably-sized protected areas. Taken together, this strongly suggests that unnaturally low prey densities are limiting lion numbers in this ~25,000 km² iconic protected area. In 2023, we initiated a “wildlife CSI” campaign to quantify the extent and effects of bushmeat poaching by humans on lion numbers. Our crew employs a combination of detection dogs (to remove snares set illegally for zebra and antelopes), DNA barcoding of meat at local butcheries (to identify the amounts of wildlife marketed and sold as beef or mutton), and community outreach campaigns. Through heightened enforcement and education, we hope to provide a combination of increased deterrents and alternative protein sources for locals, thereby bolstering lion numbers via prey populations.

Continued partnering with ranchers to boost numbers of lions through rotational grazing. On the Laikipia Plateau of central Kenya, cattle production has occurred for centuries in landscapes with 700% the numbers of large carnivores than the Intermountain West region of the US. One key to this long-term coexistence is the use of predator-proof bomas: corrals that safely constrain stock at night while excluding lions, leopards, and other large carnivores. Such bomas are rotated every 1-2 months, leaving in their wake nutrient-rich grazing lawns that are attractive to zebra, the primary prey of lions. Consequently, we have been able to collaborate with OI Pejeta Conservancy on a rotational grazing scheme that manipulates the spatial distribution of zebra, thereby shifting the hunting activity of lions and alleviating predation on a declining species of antelope (Jackson’s hartebeest). However, we are currently lacking a key piece of this puzzle: how long can grazing lawns be used as a tool to shift lion predation by serving as zebra “magnets”? To answer this question, we established grids of camera traps centered on grazing lawns of different ages. This effort will enable us to pinpoint the number of years at which the attractive effect to zebra wears off. Moreover, filling this knowledge gap will inform the number, spacing, and rotational timing of bomas, and provide a means by which ranchers and wildlife conservationists can collaborate on range management strategies of mutual benefit.

Completion of work to understand the effects of big-headed ant invasion on predator-prey dynamics. This portion of our work was supported largely through the National Science Foundation since 2017, but the Global Perspectives Grants Program provided funding to collect and analyze data that was crucial to completing this work. Since the early 2000s, introduction of the invasive big-headed ant has rearranged a food web at OI Pejeta Conservancy involving acacia trees, elephants, zebra, African buffalo, and lions. Invasive big-headed ants kill and displace the native *Crematogaster* ants that defend whistling-thorn acacia trees, rendering them vulnerable to browsing by elephants. When elephants browse whistling-thorn trees, they promote “visibility” and transform savannas into more open landscapes. In such landscapes, lions—which are ambush predators—are less effective at killing zebra, which rely on spotting lions from a distance to avoid being killed. This forces lions to switch diets to larger but more dangerous buffalo. The results of this research were

published in *Science* (Kamaru et al 2024), and they were covered by over 90 national and international media outlets, including *CBS*, *NPR*, *BBC*, *The Atlantic*, *USA Today*, *The Guardian*, *National Geographic*, and *Scientific American*. The UW press release for this work is here:

<https://www.uwyo.edu/news/2024/01/uw-led-research-shows-invasive-ants-change-lion-predation-in-kenya.html>

2. Future plans: N/A.

3. Potential impacts: our research offers a complementary view to that widely held in the US as to how livestock might be produced in multi-use landscapes in which large carnivores occur. In our study areas, large carnivores (lions, leopards, cheetah, hyenas, African wild dogs) are seven times as numerous as wolves, bears, and mountain lions in northwestern Wyoming. Yet, livestock losses are roughly half that of those reported in Wyoming and, more broadly, the Intermountain West. The extent to which livestock producers might be engaged through this research would require buy-in (both financial and philosophical) from several parties. I am always happy to chat, if they are interested.

Our ongoing work is critical to building a positive rapport with Kenyan ranchers, wildlife authorities (the Kenya Wildlife Service, the Wildlife Research and Training Institute), national agencies (the National Museums of Kenya), and non-government organizations (the African Wildlife Foundation, Ol Pejeta Conservancy, Mpala Conservancy). Maintaining that rapport is what allows me to (1) advise graduate students conducting their theses and dissertations in Kenya, and to (2) lead field courses for UW undergraduate students. Toward the first point, I have trained 15 graduate students (10 Kenyan) through UW. Toward the second point, over 50 undergraduate students have participated in a Kenya field course that I teach, gaining skills in radio-telemetry, bird and bat netting, and capture and immobilization of carnivores and ungulates. Maintaining these programs requires some modestly-sized pots of financial support (like the Global Perspectives Grants Program), as well as administrative flexibility through UW.







QUESTIONS? Contact Joanne Newcomb in the Agricultural Experiment Station office at aes@uwyo.edu or (307) 766-3667.