Proposal: Exploring Tolerance and Intolerance for Living with Carnivores in the Ruaha-Katavi Landscape, Tanzania

Principal Investigator: Abigail R. Whittaker

Co-Investigator: Jonathan Salerno

Project Description:

Biodiversity loss and climate change touch every aspect of our lives. These intertwined trends can drive negative impacts such as famine, floods, catastrophic wildfire, and pest and disease outbreaks(1). Protecting and restoring natural ecosystems is crucial to counter these impacts(1,2). Healthy, intact ecosystems dampen climate extremes and provide habitat for a rich array of species(3). Cultivating a wilder planet, capable of supporting more robust populations of "ecosystem engineers" like lions, wolves, elk, and elephants, will benefit people around the world. Yet because the largest expanses of natural areas occur in less-developed countries, the costs of conservation progress fall heavily on people living in poverty(4,5). In example, when large carnivores start to recover in a particular region, it can result in harmful losses for local residents (e.g. food, livestock-based income, human life). Communities that live near or depend on natural areas for their livelihood have higher risk exposure, and poverty amplifies the impact of loss(6,7). Losses to carnivore attacks often spark indiscriminate killings of the species involved(8). They can also create conflict between communities and conservation organizations over whose values about wildlife should guide decisions when residents' lives and livelihoods are at risk.

Steering toward a future where carnivores and people can coexist in the planet's finite land area will require communities to become more tolerant(9). Yet shifting human attitudes and behavior at the scale needed to protect carnivores is difficult. Tolerance depends on a complex web of social and economic factors, nested within cultural contexts(10). Indigenous people and local communities often have different values, norms, or ways of knowing about stewardship of nature. Currently, there is uncertainty around why some communities are more carnivore-tolerant than others and what would promote greater tolerance in conflict hot-spots. Past work suggests social forces play a role, and that tolerance and intolerance could spread through social networks to shape norms in communities(11,12).

Understanding tolerance is a priority issue in the Ruaha-Rungwa Landscape (RRL) in Tanzania, where my proposed research is based. RKL covers roughly over 50,000 square kilometers and is believed to be a stronghold for 10-15% of the remaining African lion population. It also supports hyena, cheetah, and African wild dogs. This landscape is home to approximately 40,000 people that depend on agriculture and livestock herding for food and income. Historically, conflict levels between carnivores and people have run high.

The Center for Human-Carnivore Coexistence (CHCC) at Colorado State University has a long-standing partnership with Lion Landscapes (LL), a grassroots nonprofit working to reduce conflict and support livelihoods. LL excels in community relationship-building and technical mitigation strategies. Their work on interventions like fortified livestock corrals, educational events, and providing veterinary care for livestock has helped to reduce carnivore encounters. Yet it is unclear how these interventions affect the attitudes of local residents toward dangerous wildlife. Would they be just as likely to retaliate against a carnivore as before if an attack did occur? And to what extent is their tolerance level shaped by personal knowledge versus the views or behavior of others? LL lacks the social science research capacity to tackle these questions, which is where CHCC can offer support.

As a CHCC research fellow, I hope to travel to RRL in June 2025 to build a collaboration spanning my PhD dissertation. Drawing on wildlife ecology, social psychology, behavioral economics and other fields, my research is centered on uncovering the drivers of predator tolerance and intolerance, and exploring the potential for social transmission of tolerant attitudes(9,11,13). The CHCC team is committed to co-producing knowledge and sharing results with affected communities, and this makes my data collection approach unique. I will be working closely with LL staff on coordinating approximately 30-40 in-depth elicitation interviews with local residents(14). Semi-structured elicitation interviews allow the voices, knowledge, and concerns of interviewees to guide the discussion. Promoting the equity and voice of local communities in decisions about wildlife conservation is an important part of building solutions that stick(15).

We will use purposive sampling to develop interview lists that represent the diversity of the local population, including local residents employed as lion defenders; relying on livestock herding income; or relying on both crop-based and livestock income. These interviews will take place while shadowing participants in their daily activities, so I will also georeference paths of travel and photo-document any patterns in the biophysical setting that could inform additional research questions(16,17). I will work with a local translator to help facilitate and transcribe all interviews. Interview transcripts will undergo qualitative analysis. In addition to applying for the necessary Tanzanian research permits, the study design, methods, and interview script will pass IRB review and approval at Colorado State University, and will follow best practices for securing free, prior, and informed consent from all participants(18).

Results of the qualitative analysis, an extensive literature review, and potential reanalysis of inconclusive data from past CHCC studies in RRL will shape my first dissertation chapter. In addition to work towards a publishable manuscript (anticipated submission 2026), I will produce a research brief translated into Kiswahili for LL and study communities. This will concisely present my findings, accompanied by relevant maps and photos, and define questions for future research based on their input. Finally, I will produce a story map or similar digital platform for CHCC that incorporates analytical results, geospatial data and imagery.

In summary, the research permit I am requesting will move the research frontier on human-wildlife conflict. It will guide future study on carnivore tolerance and pathways for social transmission, as well as informing practical strategies and investments to promote tolerance on the ground. Throughout my dissertation, I am committed to working in collaboration with Tanzanian partners, using local knowledge and priorities to help shape the questions I pursue, and delivering research outputs to LL and participating communities in accessible formats. I want to advance equitable solutions for people and carnivores on the frontlines of global conservation, and I would be honored to pursue this with TAWIRI's full support.

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