

# THE THREAT OF HABITAT FRAGMENTATION AND CLIMATE CHANGE TO CHAMELEONS IN TANZANIA

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With their prehistoric look, reptilian skin, independently-moving eyes, unbelievably long tongues, and array of colors and horns, chameleons evoke strong opinions in humans. Some people seem to innately fear chameleons, while others are intrinsically drawn to them (as you might guess, I'm in the latter group). This added attention from humans has distinct benefits and disadvantages. Although the international attention increases awareness for conservation efforts, it also fuels a surprisingly large international trade in chameleons as pets. My research is intended to get a better understanding of the factors influencing chameleon populations. In addition to providing insight into their basic biology, this information is valuable for chameleon conservation efforts.

Like most plant and animal species, chameleons face a combination of threats. In addition to collection for the international pet trade, people put pressure

on chameleon populations by removing and fragmenting natural habitats and by contributing to climate change. Habitat loss obviously decreases population sizes, but in practice the effects of habitat loss are often exacerbated by the effects of habitat fragmentation. For example, population sizes in a fragmented landscape may decline because of the increase in edge habitat (which tends to benefit common, generalist species at the expense of rarer, more specialized species) or because subpopulations are isolated (which can decrease genetic diversity and increase the chance of local extinction). Furthermore, climate change is expected to have particularly dire impacts on lizards living in tropical regions. Even though the climate is warming more slowly in the tropics than in temperate regions, tropical species have evolved very narrow thermal tolerances, making them more sensitive to warming than temperate species.

I spent the 2014-2015 academic

year as a Boren Fellow in Tanzania. In addition to studying Swahili, I conducted research on chameleons in the Eastern Arc Mountains – a global biodiversity hotspot and home to many rare chameleon species. To quantify the impact of habitat fragmentation on chameleon populations, I estimated population densities in a highly fragmented landscape. I also began assessing chameleon thermal preferences and tolerances, which are known to relate to climate change vulnerability. As I continue my research, I'll be expanding my data collection to include more chameleon species and more landscapes in the Eastern Arc Mountains.

In addition to conducting scientific research, I hope to positively influence chameleon conservation efforts through my interactions with people living in the areas where chameleons actually occur. I'm guessing that you, like me, are more fascinated by chameleons than scared of them. But this isn't the case for most Tanzanians, who generally consider chameleons bad and dangerous. Even my technician this past year was scared to touch a chameleon. But as he learned more about chameleon biology and their ecological role, his fear slowly subsided and was replaced by fascination. To help others make this transition, I gave a presentation at several local schools to emphasize the interesting biology and important ecological roles of the bugs and critters that people so often hate and fear for no apparent reason.

*Philip Shirk is a PhD candidate in biology. His research is funded by the Department of Biology, the Boren Fellowship, and the Mohamed bin Zayed Species Conservation Fund.*