REPTILES AND AMPHIBIANS IN THE CANOPY AND AT THE EDGES OF THE ARABUKO SOKOKE FOREST

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In summer 2018 the Center for African Studies pre-dissertation research award allowed me to travel to the Arabuko Sokoke Forest in Kenya to study how forest edges are impacting canopy dwelling species in the forest. The formation of edges from habitat loss degrades forests ecosystems by reducing the quality of remaining habitat. These impacts penetrate from edge to forest interior and include the loss of biodiversity, changes in animal community composition, reduction in tree density and carbon storage, and the disruption of microclimates. While research on edge effects has been extensive, virtually no work has explored these effects within the hard- to-reach canopy or on arboreal species that live there.

At 420 km², the Arabuko Sokoke forest is the largest remaining piece of the once-vast east African coastal forest that used to stretch from southern Somalia to central Mozambique. The Arabuko Sokoke Forest provides a perfect opportunity to study forest edges and how animals use this disturbed space because it is almost completely surrounded by agricultural land, which creates sharp edge transitions from agricultural land to natural forest. In addition to the forest being home to an incredibly rich and unique group of animals, which has earned it the status of a global biodiversity hotspot, it is also considered one of the richest sites in Kenya for reptiles and amphibians. I chose to use reptiles and amphibians for our research, as they are particularly sensitive to climate variation and dehydration and so very susceptible to the impacts associated with habitat edges.

To study these animals in the canopy I recruited a team of five assistants: Godana Peters, a local reptile expert, Gilles Bernard, a French ecologist with extensive tree climbing experience, Joe Henry, a fellow PhD student at UF, Austin Ward, research assistant extraordinaire, and Kitsao, our camp manager and cook. In total, using arborist tree climbing techniques, we conducted 250 hours of surveying on the ground and in the canopy, and 146 one-hour tree climbs across 74 sites. During these surveys we encountered 310 animals and 24 species from the leaf layer, all the way up to the top branches of the canopy.

Two species we encountered were of particular interest. The first was the green keep-bellied lizard. This rare and elusive species is not well known in the area and we sought to find it in the forest and gain information about what habitat types it may prefer and to what extent it uses the canopy. However, as this species is very elusive, we were thrilled to encounter 2 of them. These two both came from one of the three forest types in the forest and were clearly canopy specialists. The second lizard of interest was a gecko species which is thought to be Broadley's dwarf gecko. The local experts at the National Museum of Kenya are in the process of confirming this record. This would be only the second record of this species in Kenya and a first record for the Arabuko Sokoke Forest.

Currently I am inputting data and beginning the preliminary analysis to explore how edge effects are impacting both the habitat structure and the community of reptiles and amphibians found there. Summer 2018 research was incredibly successful in allowing me to gather preliminary data and explore the most relevant research directions for the future. It also allowed me to establish professional networks with many different organizations and people in Kenya. After analyzing my current data I will be applying for future funding to return to Kenya in 2020 for further research in the area.

Jesse Borden is a PhD student in the School of Natural Resources and Environment. *This research was funded by the Mohamed bin Zayed Species Conservation Fund, the Center for African Studies, the Flory Lab and the Scheffers Lab.*