

SPECIES INTERACTIONS AND BIRD COMMUNITY STRUCTURE UNDER SHRUB ENCROACHMENT

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Shrub encroachment in savannas is a global conservation challenge, radically restructuring animal communities and putting the services they provide to rural communities at risk. My research is determining how shrub encroachment affects savanna animal communities, both globally and in Swaziland. I am using a meta-analysis of shrub encroachment studies worldwide and intensive bird surveys across shrub-encroachment and land-use gradients in Swaziland's Lowveld savanna to do this. I will also be building upon this work with a field experiment to determine drivers of the changes seen in my synthetic and observational work.

I have found that shrub encroachment effects on animal community structure—the number of species plus their relative and absolute abundances—are reasonably well-described but we have paid little attention to what mechanisms are generating this pattern. Shrub encroachment increases the amount of temporally stable cover, which should change the costs and

benefits of savanna habitat for predators and prey alike.

I found that shrub encroachment in Swaziland's Lowveld savanna was associated with an increase in several predatory birds that prey on other bird species at all life stages. This was accompanied by changes in the dietary groups represented in the bird community, which were more evenly-distributed because seed-eating birds declined whilst fruit and nectar-feeding birds increased. Diet is the major way birds exert their effects on ecosystems, providing services to rural communities, so understanding shifts in the feeding groups in savanna bird communities is of conservation as well as theoretical interest.

I am going to determine the extent to which changes in predatory bird abundance are causing changes in the prey bird community using a field experiment. I will accomplish this by enriching visual and auditory cues of predatory birds across a shrub encroachment gradient and observing how the behavior and abundance of prey species respond to the addition of this “public information” about risks and benefits of choosing open versus shrub-encroached savanna.

I will be studying how anti-predator behavior within and among several closely-related species of seed eaters and fruit eaters. This work will determine if behavioral strategies can predict which species flourish with shrub encroachment and which species flounder. I expect that behavioral flexibility will be key; species that exhibit appropriate anti-predator behaviors across all levels of shrub cover will do better than species with behaviors only suited to one cover regime.

Shrub cover is the most tractable target of management for biodiversity and ecosystem services although predator-prey interactions may prove to be the major driver of bird community structure in African savannas. I am exploring options for a multiscale shrub thinning experiment

intended to determine how to most efficiently allocate thinning efforts for vertebrate diversity. This will link the mechanisms of community assembly identified in my research and the work of colleagues to practical prescriptions for managing shrub encroachment in rural communities.

Richard Stanton is a PhD candidate in the School of Natural Resources and the Environment. This project has been funded by the School of Natural Resources and the Environment, the Center for African Studies, and Drs. McCleery and Fletcher in the Department of Wildlife Ecology and Conservation.