

Public Abstract

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Title:GRAZING LAWNS ACROSS AFRICA: A CASE STUDY COMPARISON BETWEEN KRUGER NATIONAL PARK AND SERENGETI NATIONAL PARK

Grazing lawns are highly utilized grassland patches that represent key resource areas for large herbivores. Within these lawns exists the potential for complex interactions among herbivores, plants, fungi, and soils. It is essential that we understand the mechanisms that presently maintain lawns today so that we can better predict how they may respond to future impacts such as climate change and invasive species. Our study asked the following three key questions: (1) how is lawn vegetation different from the surrounding matrix? (2) Are the differences between the lawn and matrix associated with below ground factors? (3) Are differences due to plant community turnover or intraspecific variation?

In 2011, two parallel studies were conducted in Kruger National Park (KNP), South Africa and Serengeti National Park (SNP), Tanzania to compare key functional and structural characteristics between lawns and the surrounding matrix. Modified Whittaker plots were used to quantify: (1) species-level and community-level plant nutritional and structural variables, (2) soil variables and (3) arbuscular mycorrhizae fungal (AMF) colonization rates.

KNP lawns were characterized by higher community-level foliar nitrogen and leaf-to-stem ratios than matrix plants, but no edaphic differences were found. Additionally, KNP lawns showed greater species-level foliar P. SNP had high community-level foliar P and Na, along with greater species-level foliar N in lawns. SNP also had higher organic C in lawn soils. Neither study found differences in AMF colonization rates.

Generally, both sites shared a pattern of greater foliar nutritional quality in the lawn plots. Edaphic nutrients failed to directly account for the greater foliar nutrient concentrations that were prevalent in grazing lawns. Given the lack of clear relationships with plant available nutrients in KNP and SNP, these patterns are likely mediated by aboveground effects, i.e., herbivores. If herbivores alone maintain grazing lawns, a shift in herbivore numbers or distribution may result in the loss of grazing lawn plant communities.