White-tailed Deer and Coyote Activity in an Agroforestry Landscape

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## Abstract

Agroforestry, the integration of trees into livestock and crop farming systems, provides an opportunity for food production and functional ecological processes to co-exist. Such systems may alter wildlife behavior and interactions, but research on wildlife in the agroforestry setting is limited. In fall 2019, we conducted a camera trap survey at the Horticulture and Agroforestry Research Center (HARC) to evaluate white-tailed deer (Odocoileus virginianus) and coyote (Canis latrans) activity patterns in the context of an agroforestry farming system. We analyzed deer and covote activity within five natural (edge, open, wooded) or farmed (orchard, pasture) cover types present on the farm using the R packages 'activity' and 'overlap' to quantify and compare activity patterns. We found both coyotes and deer were active at night, but deer also had activity peaks in the morning and evening. Although temporal overlap between deer and covotes was high (0.74; 95%CI=0.64-0.79), we observed some spatial segregation among available cover types. Both species were recorded in every cover type at least once, but covotes spent most of their time in orchard and wooded areas, while deer used open and orchard cover types most frequently. Coyotes may have shifted their activity to nocturnal hours and limited their diurnal activity to primarily wooded areas due to the regular presence of human activities at HARC. There was a significant difference between deer and coyote use of wooded (p=0.02) and edge (p<0.001), but not orchard (p=0.98) areas. Orchards may represent a high-resource area for deer and coyotes (i.e., tree nuts and prey species available), which could explain the shared use of orchard areas we observed. Surveys spanning multiple years and seasons, and additional analyses are required to gain a more complete understanding of these relationships in the agroforestry setting.