

White-tailed Deer and Coyote Activity in an Agroforestry Landscape Harrison D. Stoudt, Summer D. Higdon, Matthew E. Gompper, and Ronald Revord School of Natural Resources, University of Missouri

Introduction

The broad-scale fragmentation of natural areas for agricultural developments threatens wildlife populations by limiting access to those areas and straining human-wildlife interactions. Agroforestry, the integration of trees into livestock and crop farming systems, provides an opportunity for food production and functional ecological processes, including wildlife corridors, to co-exist. Coyotes (Canis latrans) and white-tailed deer (*Odocoileus virginianus*) commonly make use of modified landscapes, but research on whether and how these species use temperate agroforestry systems is limited.

Our objectives were to evaluate coyote and deer use of and interactions within an agroforestry landscape.



Figure 1. The Horticulture and Agroforestry Research Center (HARC) is a matrix of farmed and natural landscapes in Howard County, MO.

Methods

- Placed 15 camera traps across a grid of five natural (edge, open, wooded) or farmed (orchard or pasture) cover types at the Horticulture and Agroforestry Research Center (HARC; Figure 1) for approximately 45 days in fall 2019.
- Recorded location, date, time, and cover type for each deer and coyote image captured (Figures 4 and
- Estimated and compared activity patterns of deer and coyote using R statistical software and packages 'overlap' and 'activity'.



disturbances. Coyotes we observed may have adopted this nocturnal activity pattern due to the regular human activity at HARC. Although common in natural areas, their limited use of open and pastured areas at HARC may be reflective of a need for denser cover in the presence of humans.

Orchards may offer easy access to food such as tree nuts for deer and coyotes and the presence of other potential prey species (i.e., opossum, raccoon, squirrels) for coyotes. Our results suggest that the risk of sharing orchards is mediated by the reward of the particularly high-resource availability at these sites.

Ongoing surveys spanning multiple years and seasons will shed more light on the interactions we observed. We expect these patterns may shift seasonally in response to tree nut availability in orchards during fall and deer fawning season in spring. Figures 4 and 5 (right). A coyote moves through a pecan orchard (top) and a deer notices the camera trap in a naturally wooded area (bottom).

Both species were active at night, but deer had activity peaks in the morning and evening (Figure 2). Temporal overlap between deer and coyotes was high (0.74, 95%CI=0.64-0.79).

Both species were recorded in every cover type, but coyote activity was typically limited to wooded and orchard areas, whereas deer activity was most common in open and orchard cover types (Figure 3).

There was a significant difference between deer and coyote use of wooded (p=0.02) and edge (p<0.001) areas, but no difference between coyote and deer use of open and pasture areas.

We observed frequent use and overlap (0.63, 95%CI=0.52-0.67; p=0.98) among coyotes and deer in the orchards.

