

Spatial Variation in Brown-Headed Cowbird (*Molothrus ater*) Abundance and Brood Parasitism in Flint Hills Tallgrass Prairie

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ABSTRACT

Environmental factors affecting habitat selection range from species-specific habitat requirements to general aspects of intraspecific competition. Different proximate factors may affect spatial patterns of host selection by the brood parasitic (*Molothrus ater*) brown-headed cowbird within grasslands. Here I examined how such factors might affect cowbird distribution among tallgrass prairie-woodland edge and tallgrass prairie interior habitats within the Flint Hills of eastern Kansas and Oklahoma. First, I experimentally tested the hypothesis that the presence of elevated perches—similar to those provided by trees and shrubs—increases the abundance of cowbirds in grasslands and their parasitism of grassland-nesting birds (Chapter 1). However, cowbird abundance and parasitism levels of dickcissel (*Spiza americana*) nests were similar among experimental perch plots, prairie interior plots (>100 m from wooded edges), and plots near (\leq 100 m) wooded edges when averaged across eight study sites. As cowbird habitat use patterns might be distorted by density-dependence in their habitat selection, I also examined cowbird use of these three habitats in relation to geographic variation in cowbird abundance across the Flint Hills (Chapter 2). Cowbird abundance and parasitism rates were higher near wooded edges than in prairie interior on study sites where cowbirds were less abundant and parasitic, but increased within open prairie interior at faster rates as the magnitude of these measures increased geographically. Experimental perch and open prairie habitats were used equally by cowbirds across the region. Density-dependent selection of edge and interior habitats by cowbirds might result from observed negative density-dependent effects of multiple parasitism on cowbird reproductive success. As local cowbird parasitism rates on dickcissel nests varied greatly across the region (from 0% to 92% of nests parasitized) an attempt was made to identify possible ecological correlates with local parasitism levels (Chapter 3). However, parasitism levels were unrelated to habitat structure at local and landscape scales and local host community attributes, being positively correlated only with local female cowbird density. Dickcissel reproductive success was negatively related to local cowbird parasitism levels. This study demonstrated that habitat-specific and overall cowbird parasitism levels can vary greatly with geographical variation in cowbird abundance, independently of geographical variation in habitat or host community attributes.