

Public Abstract

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Title:AVIAN NEST SURVIVAL AND BREEDING DENSITY IN COTTONWOOD PLANTATIONS AND NATIVE FOREST FRAGMENTS OF SOUTHEAST MISSOURI

There is considerable interest in reforestation of significant portions of the Mississippi Alluvial Valley (MAV) where alteration of the landscape has resulted in extensive loss of breeding habitat for forest nesting birds. Fast growing tree species such as cottonwood (*Populus deltoides*) are grown for paper pulp production, often in areas where intermittent flooding reduce the potential for commodity crops such as corn or soy beans. The quality of plantation forests for breeding birds are questionable, due to differences in structure and tree species composition.

I compared nest survival and breeding density between native bottomland forest and cottonwood (*Populus deltoides*) plantations over a three-year period for Acadian Flycatcher (*Empidonax virescens*), Prothonotary Warbler (*Protonotaria citrea*), and Indigo Bunting (*Passerina cyanea*). Nest survival was similar in both forest types and varied throughout the season for all species. Acadian Flycatcher nest survival increased and parasitism by Brown-headed cowbird (*Molothrus ater*) decreased with increasing percent forest cover. Indigo Bunting nest survival was negatively associated with distance to edge and probability of parasitism decreased in larger patches. I used video cameras to record songbird nests in both forest types. Snakes and birds, including Brown-headed cowbirds, were nest predators.

I also compared unadjusted abundance estimates from point count data to multiple model-based estimates. Densities of Acadian Flycatcher and Prothonotary Warbler were higher in native forest. Indigo Bunting densities were higher in plantations, but significance of the difference depended on the method used. Methods incorporating multiple time intervals and the full encounter history of each individual provided more precise estimates than traditional removal methods or distance methods.

My research demonstrates that plantation forests can provide alternate breeding habitat for forest nesting species in the MAV. However, for forest dependent species (Acadian Flycatcher and Prothonotary Warbler) differences in breeding density indicate that native forest habitat produces more birds than plantations, and therefore may be preferred over plantations for conservation purposes. For some species, nest survival in both forest types is unlikely to be high enough for the population to be self-sustaining. Besides providing additional breeding habitat, plantations may mitigate some of the effects of fragmentation by increasing the amount of forest cover in the landscape.