Width of Riparian Buffer and Structure of Adjacent Plantation Influence Occupancy of Breeding Birds in Managed Forest Landscapes

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Abstract: Streamside management zones (SMZs) are forested riparian buffers retained along streams in landscapes under active forest management. Although studies have examined effects of SMZ width on avian communities, effects of adjacent plantation age on bird community responses to SMZ width is valuable information that is lacking. We used occupancy modeling, after accounting for variable detection probabilities, to model probability of occupancy for 16 bird species considered regionally important in the Ouachita Mountains of Arkansas. We examined effects of SMZ width on occupancy within three structural classes of loblolly pine plantation: young open plantations, closed-canopy plantations, and older thinned plantation. Probability of occupancy for Acadian flycatchers (*Empidonax virescens*), summer tanagers (*Piranga rubra*), and pine warblers (*Dendroica pinus*) increased with increasing width of SMZ, and occupancy was related to condition of adjacent plantations. Occupancy of prairie warblers (*D. discolor*) and northern bobwhite (*Colinus virginianus*) decreased with increasing SMZ width; occupancy of prairie warblers was greater in SMZs surrounded by young open plantations and occupancy of northern bobwhite was greater in SMZs surrounded by older thinned plantation. Occupancy for seven additional species associated with mature forests increased with increasing width of SMZ and probability of occupancy for three species associated with early successional habitat decreased with increasing SMZ width, but condition of adjacent plantation was not included in the best models for these species. We found a multitude of responses by different species to retained SMZ width and age of adjacent plantation. Therefore, optimal width of SMZs depends on management objectives and target species of breeding birds.

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