

LANDSCAPE COMPOSITION MODULATES THE EFFECTS OF FOREST
FRAGMENTATION: VARIABLE CONSEQUENCES FOR BREEDING OVENBIRDS

(SEIURUS AUROCAPILLUS)

BY

COLIN E. STUDDS

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Abstract. The demographic impacts of forest fragmentation on migratory songbirds have been studied primarily in relation to forest loss at the patch and landscape-scale. However, modernizing landscapes have additional properties that may influence breeding bird habitat quality. In particular, patterns of landscape composition that result from conversion of forest to different types of land use may have disparate effects on the biotic and abiotic factors that influence habitat occupancy, nest predation, and brood parasitism by Brown-headed Cowbirds (*Molothrus ater*). I conducted a landscape-level mensurative study designed to examine the independent effects of forest fragmentation by agricultural and residential development on breeding Ovenbirds (*Seiurus aurocapillus*).

Landscape composition had a pronounced effect on each variable studied, but the direction and magnitude of the trends varied. Ovenbirds occurred at highest densities in landscapes with extensive forest cover and low levels of development, at intermediate densities in agriculturally fragmented landscapes, and at lowest densities in residentially fragmented landscapes. Contrary to most previous research, nest predation and brood parasitism were not explained by patterns of forest cover and forest patch size. Instead, increases in predation were linked to residential development and increases in parasitism were related to agriculture. These trends were paralleled by increases in predator abundance in residential landscapes and increases in cowbirds in response to agriculture and cowbird host abundance. Estimates of annual fecundity were higher in unfragmented landscapes than in both of the fragmented landscapes, but the mechanism depressing fecundity differed and reflected differences in predation and parasitism pressure among landscapes. Ovenbird populations in unfragmented landscapes likely were population

sources while both of the fragmented landscapes were likely population sinks. These results highlight the importance of modifying conservation strategies and management protocols to include consideration of emerging properties of landscape complexity.

Key words: habitat fragmentation; habitat occupancy; landscape composition; neotropical migrant songbirds; Ovenbird; Seiurus aurocapillus; Rhode Island; source-sink dynamics.