

FEATURE ARTICLES

**EFFECTS OF URBAN SPRAWL ON SNAGS AND THE ABUNDANCE AND PRODUCTIVITY OF CAVITY-NESTING BIRDS**

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*Abstract.* We investigated the occurrence of, and relationships among, snags and cavity-nesting birds in the rapidly urbanizing region around Seattle, Washington in 2001 and 2002. We measured the density of snags in 49 sites (1-km<sup>2</sup> “suburban landscapes” that included built and forested portions), and determined the diameter, height, decay status, and species of individual snags. We spot mapped territories and observed nests of cavity-nesting birds at a stratified, random subsample of 13 sites. Snags, especially red alder (*Alnus rubra*), were abundant in sites’ forested portions, but rare in the built portions. Snag density was positively correlated with density of live trees. Snags in built versus forested portions were similar in all attributes except decay, which was more advanced in forested areas. In the oldest suburbs (60–80 years old), snags in forested portions were larger, more decayed, and more likely to have broken tops than those in younger suburbs (2–20 years old). Cavity-nesting bird species richness and equity of individuals per species was highest in suburban landscapes where remaining forest was not fragmented, but adjacent to highly intermixed urban and urban-forest land covers. Suburban landscapes with highly interspersed land covers had higher densities of Black-capped Chickadees (*Poecile atricapillus*), Red-breasted Nuthatches (*Sitta canadensis*), Northern Flickers (*Colaptes auratus*) and Downy Woodpeckers (*Picoides pubescens*); suburban landscapes with higher percentages of forest had higher densities of Brown Creepers (*Certhia americana*), Chestnut-backed Chickadees (*Poecile rufescens*), Pileated (*Dryocopus pileatus*) and Hairy Woodpeckers (*Picoides villosus*). Red-breasted Sapsucker (*Sphyrapicus ruber*) densities were positively correlated only with the density of snags. All study sites had low bird densities compared to wildlands, presumably due to the relative lack of live trees and snags. Cavity-nesting birds bred successfully in all landscapes; seven of the nine species produced fledglings in >50% of their nesting attempts. Snags important for nesting were larger in diameter, taller, and more decayed than expected based on availability. Snags with active nests also had evidence of previous use, fungal conks, broken tops, and substantial bark.

*Key words:* cavity-nesting birds, density, land cover, productivity, Seattle Washington, snags, urban sprawl.