Conserve Native Birds in Residential Neighborhoods by Managing Neighborhood Forest and Limiting Surrounding Development

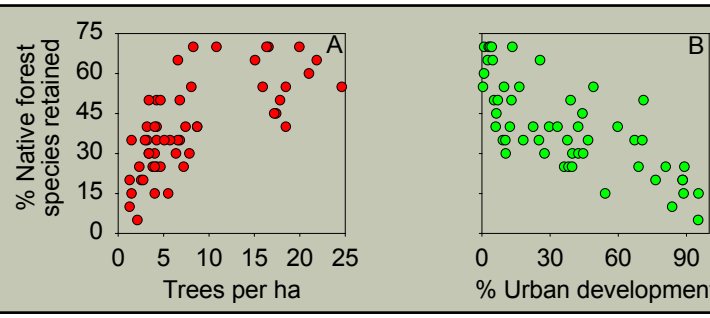
The human population in the Seattle metropolitan region is expected to grow by 40% in the next 30 years, converting forest to suburbs and urbanizing existing suburbs (Figure 1). My research in the Seattle metropolitan area, conducted through the University of Washington, suggests that this growth will affect breeding songbirds. Bird species closely associated with large patches of forest (native forest species) will decline in abundance or disappear, while birds associated with human activities (synanthropic species) will colonize new areas and increase greatly in abundance. We can conserve native forest birds and accommodate the need for more housing by managing characteristics of residential neighborhoods and by preserving native habitat in reserves. This fact sheet explains what aspects of neighborhoods are particularly important to birds and how they can be managed. I focus on habitat reserves in a separate fact sheet.

Figure 1. Aerial photographs of Snohomish County show how human settlement decreased the amount of forest, dispersed remaining forest stands, lowered tree density in neighborhoods, and increased development between 1969 (A) and 1995 (B).

What attributes of residential neighborhoods affect the number of bird species present?

More native forest bird species are retained in neighborhoods with greater tree density and less urban development within the surrounding landscape (1 km^2; Figure 2). Some native forest species disappear in predictable order with decreasing tree density and increasing urban development (Figure 3). Others are present in all types of neighborhoods, like the American Robin, Chestnut-backed Chickadee, Spotted Towhee, Steller's Jay, and Dark-eyed Junco.

Figure 2. Retention of native forest bird species increases with tree density (A) and decreases with urban development (B).



What attributes of residential neighborhoods affect the abundance of bird species?

Characteristics of neighborhoods and landscapes also affect the abundance of individual bird species (Figure 4). Native forest species decrease with the amount of urban development and increase with coniferous trees and forest aggregation because development provides supplemental food for predators and forest provides native vegetation for nesting, feeding, and shelter. Synanthropic species show the opposite response to the same variables because their feeding strategies and nest sites are associated with human activity. For example, the American Crow feeds on human refuse and the European Starling nests on buildings.

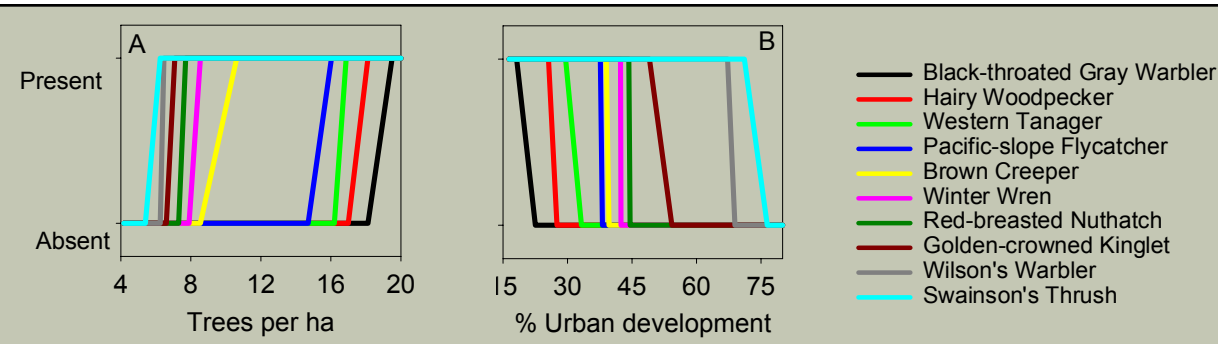


Figure 3. Thresholds of (A) neighborhood tree density and (B) urban development where species disappear from communities. For example, the Black-throated Gray Warbler is lost with minimal tree removal, but the Swainson's Thrush remains until most of the trees are gone.

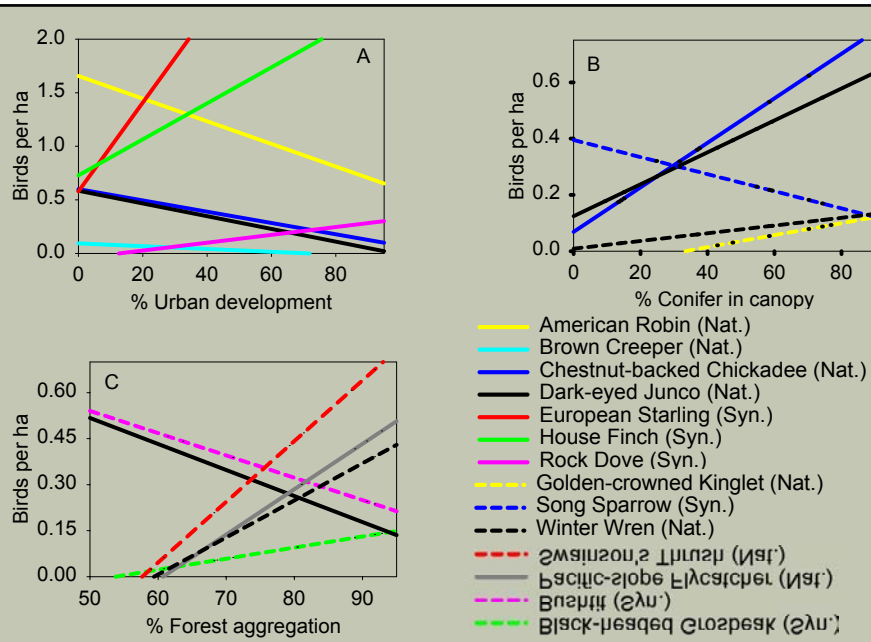


Figure 4. Abundance of native forest (Nat.) and synanthropic (Syn.) bird species in neighborhoods (A and B) and landscapes including neighborhoods (C, 1 km^2) in relation to the amount of development and forest characteristics.

How can we manage neighborhoods to conserve bird species?

The relationships described above suggest management targets for neighborhoods approximately 1 km^2 in size. To conserve native forest species: (1) policy makers should limit urban development to 52% of the landscape; (2) urban planners should keep at least 64% of the remaining forest aggregated, creating stands greater than 42 ha wherever possible (see fact sheet on habitat reserves); and (3) land managers and homeowners should maintain at least 23% conifers in the canopy and maintain tree density above an average of 9.8/ha. Tree density in individual yards should vary around this average.

Because some bird species are native to the region but require some open habitat or human activity (i.e, classified as synanthropic), I recommend managing for these targets in most, but not all landscapes. For example, some landscapes with less than 23% conifers in the canopy will encourage greater abundance of native species such as the Song Sparrow and Downy Woodpecker. Limiting settlement in other landscapes to only 5-10% of the area will encourage greater abundances of forest-dependent species like the Pileated Woodpecker, Brown Creeper ,and Winter Wren.

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