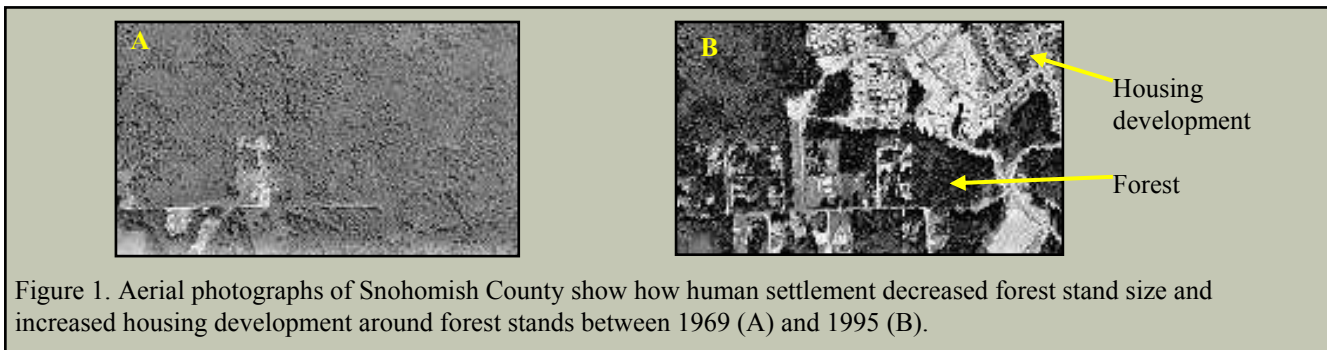


Conserve Native Birds in Suburban and Urban Landscapes by Creating Moderate-sized Habitat Reserves

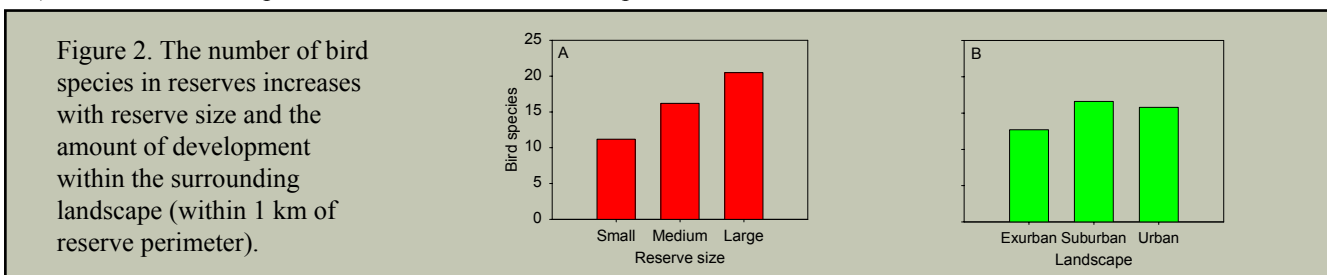


The human population in the Seattle metropolitan region is expected to grow by 40% in the next 30 years, converting forest to suburbs and urbanizing existing suburbs (Figure 1). My research in the Seattle area, conducted through the University of Washington, suggests that this growth will affect breeding 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 meet housing demand by preserving native habitat in reserves and by managing characteristics of residential neighborhoods. This fact sheet explains the relative importance of reserve size and landscape context to birds and how these attributes can be managed. I focus on neighborhoods in a separate fact sheet.



How do reserve size and landscape context affect the number of bird species present?

The number of species contained within a reserve increases with reserve size (Figure 2A) and is greater in suburban and urban landscapes (~40% and >60% developed, respectively) than exurban landscapes (<10% developed without agriculture; Figure 2B). The first pattern is explained by greater retention of native forest species in larger reserves (Figure 3A). The second pattern is explained by greater colonization of synanthropic species in more developed landscapes (Figure 3B). One native forest species, the American Robin, was present in all reserves.



How does reserve size and landscape context affect the abundance of bird species?

Landscape context also affects the abundance of individual bird species in reserves (Figure 4). Two native forest species (Winter Wren, Black-throated Gray Warbler) reach maximum abundance in exurban reserves. Native forest (Brown Creeper, Chestnut-backed Chickadee, Spotted Towhee, American Robin) and synanthropic species (Black-headed Grosbeak, Bewick's Wren) reach maximum abundance in suburban and urban reserves. In general, native forest species are rare and synanthropic species are common where there is more non-native vegetation on the ground and in the shrubs. This type of vegetation adversely affects native forest species by competing with native plants required for nesting, food, and shelter. Greater amounts of non-native vegetation also suggest greater activity of predators (e.g., rats and cats) that are intentionally and unintentionally fed by humans.

Figure 3. Thresholds of reserve size and urban development where native forest species and synanthropic species tend to switch from absent to present. For example, the Winter Wren is present in very small reserves, but the Brown Creeper requires at least 28 ha of forest. Figure A does not depict thresholds for Hutton's Vireo (69 ha), Downy Woodpecker (70), or Hairy Woodpecker (179).

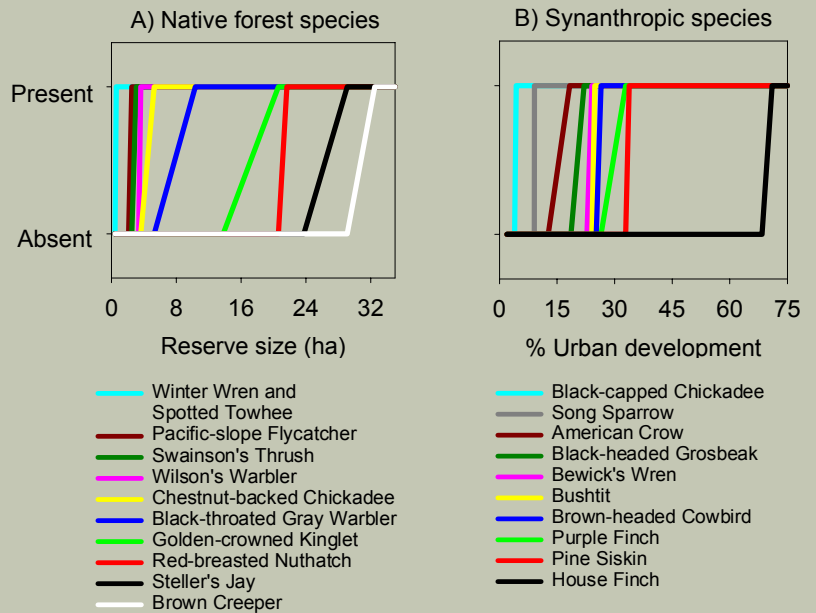
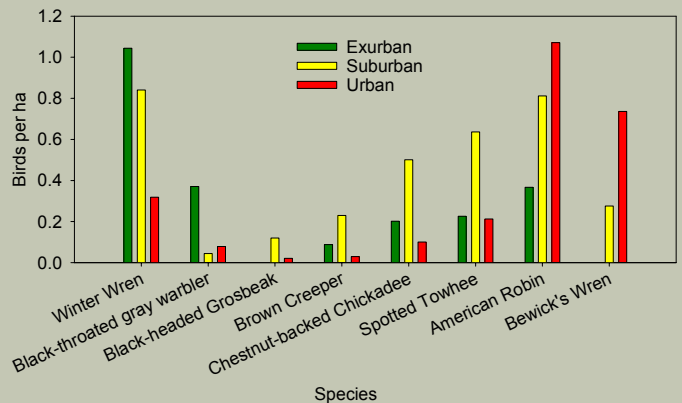


Figure 4. Abundance of bird species in reserves in relation to the amount of development within 1 km of the reserve perimeter.



How can we manage habitat reserves to conserve bird species?

The relationships described above suggest management targets for habitat reserves. To retain native forest species and limit the number of synanthropic species: (1) urban planners and land managers should locate reserves of at least 42 ha (smaller size is not detrimental in exurban landscapes) where they are surrounded by less than 40% urban development; (2) policy makers should facilitate this process by limiting overall urban development within some regions; and (3) land managers and homeowners with forest on their property should encourage greater abundance of native forest species and discourage greater abundance of synanthropic species by controlling exotic vegetation.

Because some bird species are native to the region but require smaller forest stands or human activity (i.e., classified as synanthropic), I recommend creating some reserves that do not meet the above size and development thresholds. For example, small urban parks support high densities of the native Bushtit.

This research was conducted by Roarke Donnelly and John M. Marzluff at the University of Washington. For more information, please contact Roarke (rdonnelly@facstaff.ogletorpe.edu; [404] 346-8401; Biology Dept., Oglethorpe University, 4484 Peachtree Rd. NE, Atlanta, GA 30319).