



A tree swallow surveys its territory from atop a nest box in Stroud Preserve, West Chester, Pennsylvania. Stroud Preserve is a Natural Lands Trust property; remnant forests like this one protect regional biodiversity. Photo by Vince D'Amico, USFS

From the USDA Forest Service and Partners

What are the Birds and Bees Telling Us?

By Susannah Lerman, Vince D'Amico, and Phillip Rodbell

As arborists and urban foresters, we are hired for our knowledge of trees and forest management. But trees are part of an ecosystem, and we know they cannot thrive unless the conditions around them are optimal for growth. The Forest Service has learned a tremendous amount about best management practices through the study of biodiversity and urban forest habitats for birds and bees; this article will highlight some of these findings and their implications for those of us seeking to grow healthy and thriving trees and forests.

Habitat Considerations

The urban forest provides many ecosystem benefits, including carbon sequestration, shading, air and water pollution reduction, and stormwater runoff mitigation. The urban forest also provides wildlife habitat for birds, bees, and other animals. Rapid habitat assessment tools can increase our capacity to assess bird habitat potential within the urban forest and to evaluate existing habitat improvement plans, and can provide detailed information about habitat requirements.

A newly developed wildlife habitat module integrates bird habitat relationship models into [i-Tree Eco](#), the USDA Forest Service urban forest assessment tool.

This makes it possible to use i-Tree urban forest datasets to calculate the overall bird habitat suitability for a city or a delineated i-Tree project, and the habitat suitability for different types of land use (e.g., residential, commercial, parkland) for each bird species. By combining and augmenting decades of bird data with i-Tree, researchers and managers can create and quantify countless targeted assessments, detailed predictions, and visual components that can guide land management decisions across the northeastern U.S. and eventually, beyond (Lerman et al. 2014).

Managing the urban forest for cavity-nesting species can be particularly challenging. Species like red-bellied woodpeckers and black-capped chickadees nest in the dead and decayed stems and branches of different types of trees. From a habitat management perspective, letting dead and dying wood remain in the landscape can provide critical habitat for these and other species. However, dead and dying trees may also have a greater risk of failing and, in a developed setting, may lead to personal injury and damaged property. Research from western Massachusetts and Baltimore, Maryland suggests partial pruning rather than complete removal of the tree might strike a balance between reducing risk and retaining habitat (Kane et al. 2015). >>

Edgy Forests

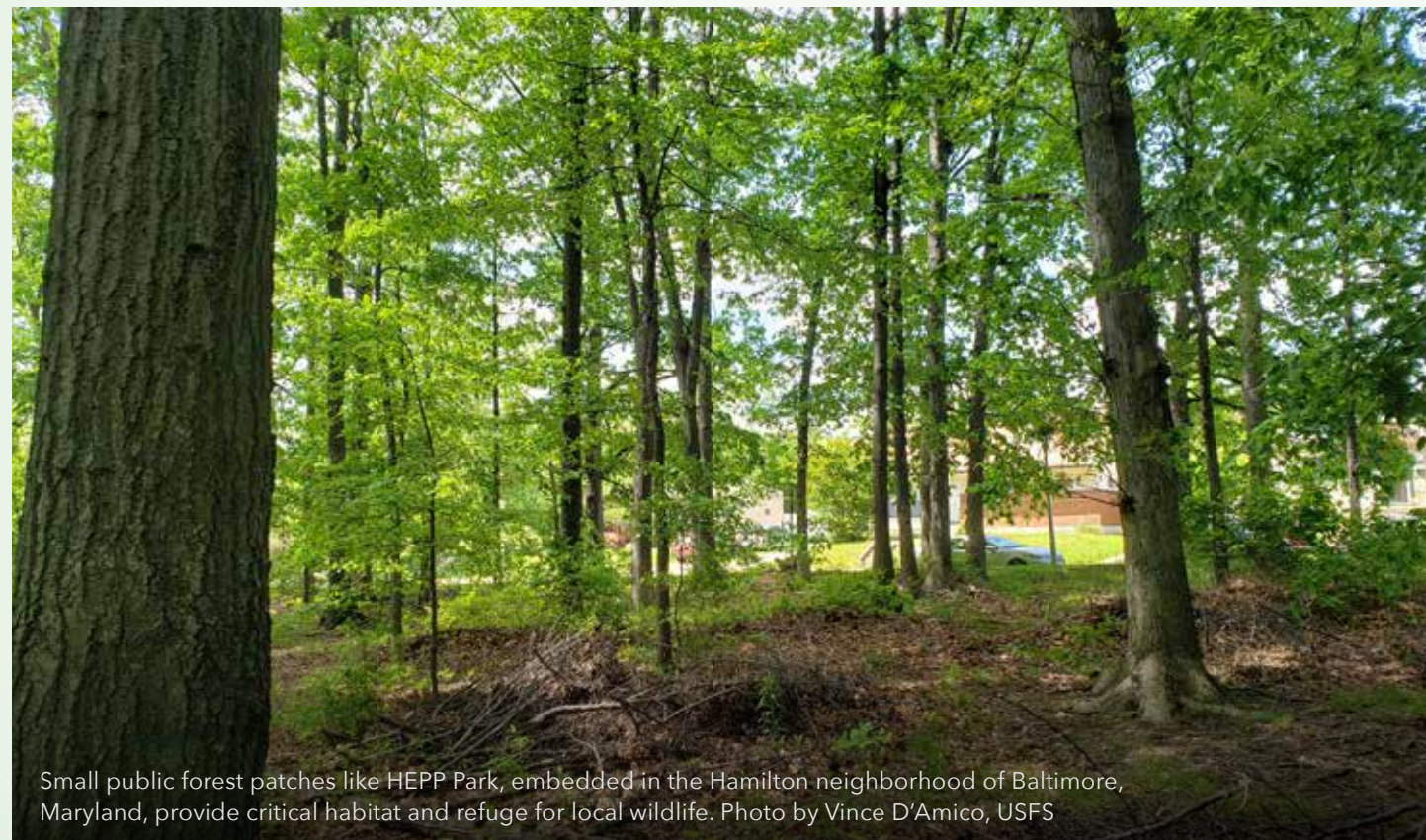
Our modern landscape, especially in the temperate region of the eastern United States, has become very “edgy.” A landscape that was once a vast and mostly uninterrupted forest was cut down as European colonists built homes, cleared farmland, and used wood for fuel. This trend began reversing in the early 1900s as agriculture moved west. Paved roads and cityscapes created a matrix, with abandoned farmland and riparian areas left available for forests to return.

This is the eastern landscape of today. The smaller forests (forest patches or woodlands) in cities and suburbs have a much higher ratio of edge habitat to deep interior habitat. Standing in the center of an urban forest in Baltimore, for example, it’s very likely you’ll hear traffic and see houses or apartment buildings peeking through the trees.

What does this new landscape mean for animal and plant biodiversity? Small forests in cities are warmer, less quiet, and at risk for invasion by nonnative insects and plants (D’Amico 2012). USDA Forest Service research shows that there are more nonnative plants—like multiflora rose and bittersweet—in the understory of some

forests than there are native plants (Shriver et al. 2020). Other research in the Forest Service network of urban forest sites has shown that dense understories of non-native plants make good habitat for ticks (Adalsteinsson, Shriver et al. 2018). Even more disturbing, the ticks in such habitats are more likely to be carrying the bacteria that cause Lyme disease and other diseases. That may be due to greater numbers of small mammals that carry the bacteria—animals like white-footed mice, which do well in places with lots of dense ground cover.

Other forest-dwelling animals find it much harder to thrive in small, edgy forests. Bird species like wood thrush and ovenbird are not likely to put up with the disturbances of nearby streets and houses (Adalsteinsson, Buler et al. 2018). Other species, like catbirds, are more willing to nest in nonnative plants and ignore human activity. The keys to the future health of our human-dominated ecosystems may well be the management choices we make in and around our small forests to prevent further fragmentation and encourage native species, combined with what we do in our own front yards to support wildlife habitat.



Small public forest patches like HEPP Park, embedded in the Hamilton neighborhood of Baltimore, Maryland, provide critical habitat and refuge for local wildlife. Photo by Vince D’Amico, USFS



Researchers have found that lawns cut every two weeks support the highest abundance of bees. [This sign is available for download from USFS.](#)

Revisiting Lawns

Because of intensive management, many ecologists have criticized lawns as biological deserts and dismissed their habitat potential. However, given their ubiquitous presence in urban and suburban landscapes, it is practical and wise to consider alternative management practices that could enhance their habitat value.

Research from Springfield, Massachusetts demonstrated that mowing lawns less frequently—i.e., every two weeks rather than weekly—increases the abundance of floral resources such as dandelion and clover and in turn, bee abundance. Results highlight the benefit of a “lazy lawnmower” approach to providing bee habitat while demonstrating how individual households can contribute to urban conservation (Lerman et al. 2018). Household and other lawn stewards can mow their lawns less frequently, which saves time and money and doesn’t require new knowledge.

Additional research demonstrated that the taller grass from less frequent mowing did not result in more black-legged ticks—a valid concern when promoting alternative lawn management. Although ticks are present in residential landscapes, they are not detected in the lawn portion of a private yard (Lerman and D’Amico 2019).

Bottom line findings from our research: When we manage for habitat and biodiversity in our urban landscapes, we are more likely to succeed in our efforts to sustain our community trees and forests, and the people who live nearby. 🍃



Black-capped chickadees are among the bird species that nest in the dead and decayed stems and branches of trees. Research suggests partial pruning rather than complete removal of dead or decaying trees might strike a balance between reducing risk and retaining habitat. Photo by James P. Smith

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