

A Lawn Is a Lawn? Evaluating the Similarity of Residential Lawns across the U.S.

By Megan Wheeler, Arizona State University

Single-family homes across the U.S. maintain grassy lawns. Many homeowners strive for a smooth, uniform, dandelion-free appearance. It's one of the things that defines the appearance of the American residential landscape. And lawns look remarkably similar across the entire country, regardless of whether residential neighborhoods are in the eastern deciduous forest of Massachusetts or the Sonoran Desert of Arizona.

Scientists call this pattern urban ecological homogenization—the idea that diverse natural landscapes have been converted to much more similar urban ones. In my research, I tested for similarity in the iconic American lawns across the country. It was straightforward to hypothesize that lawns would be more similar to one another than the natural understory plant communities in surrounding ecosystems. But how similar are they to each other? Are the grasses used in lawns across the country different? More interestingly, are the weeds different? We all complain about dandelions invading lawns, but to what extent are weeds that come into our yards the same across diverse climates and natural environments?

I tested this idea with many colleagues as part of a larger project that examined whether residential landscapes homogenized a number of ecological attributes, including soils, microclimate, plants, birds, and insects, across seven U.S. cities—Baltimore, Boston, Los Angeles, Miami, Minneapolis, Phoenix, and Salt Lake City.

We identified about 30 residents in each city who allowed us to collect samples in their yards. To measure the lawns, we identified the relative abundance of every plant species in six randomly placed 1-m² squares in the front or back lawns. We also identified the low-growing plants in native ecosystems around the seven study cities. With all of these data in hand, it was time to make some comparisons.

Our most obvious hypothesis was clearly right. Lawns across the U.S. contained more similar species to each other than the native ecosystems across the country. Many cities shared turfgrasses, but lawn grasses were not uniform. Lawns in Boston, Baltimore, Minneapolis, and Salt Lake City almost all contained Kentucky bluegrass (*Poa pratensis*). Bermudagrass (*Cynodon dactylon*) was found everywhere except Minneapolis. Fescue lawns (*Festuca* species) were also common across regions. But Miami's most common turfgrass was the native St. Augustine grass (*Stenotaphrum secundatum*), which was only occasionally found in Los Angeles and Phoenix. One explanation for the variation in turfgrass species is regional variation in seed mixes sold in hardware stores and used by lawn care companies.

Interestingly, the lawn weeds were actually more similar across regions than the planted turfgrasses, especially common dandelion (*Taraxacum officinale*), yellow wood sorrel (*Oxalis stricta*), and white clover (*Trifolium repens*). Lawns created homogenous environments that allowed invasion by the same weed species across very different climates.

Lawns in seven cities contained 353 species from 74 families, while reference natural areas contained 397 species (but from a more diverse 93 families). Non-native species were far more

common than native species in lawns, except in Miami where the dominant turfgrass was native. On average, lawns contained one to three turfgrass species that covered about 70 percent of lawn area, plus four to 15 non-turfgrass species. That's more diversity than we might expect considering lawns are usually thought of as monocultures!

We found that lawns in wetter cities had more species, likely because more rainfall made it easier for spontaneous weeds to get a foothold. We also found that lawns where the resident reported using fertilizers or pesticides had fewer plant species. Fertilizer favors turfgrasses—and that crowds out typically less desired broadleaf weeds. However, fewer weeds mixed in with the grass can mean fewer resources available for bees and other pollinators, which use plants like clover in lawns as food sources.

Based on: 2017. Wheeler, M.M., C. Neill, P.M. Groffman, M. Avolio, N. Bettez, J. Cavender-Bares, R.R. Chowdhury, L. Darling, M. Grove, S.J. Hall, J.B. Heffernan, S.E. Hobbie, K.L. Larson, J.L. Morse, K.C. Nelson, L.A. Ogden, J. O'Neil-Dunne, D.E. Pataki, C. Polsky, M. Steele, and T.L.E. Trammell. Continental-scale homogenization of residential lawn plant communities. *Landscape and Urban Planning* 165: 54-63