

Low Tree Species Diversity in Urban Forests May Lead to Future Problems

The health of America's urban forest is becoming more and more important as the states rapidly lose forestland to development. The trees we plant in new subdivisions, in parks, along streets and in cities are the future forests of much of our nation. Fortunately due to urban forestry education, citizens and municipalities are becoming better aware of which trees to plant and where to plant them. For example, citizens participate in civic tree plantings and plant trees at home while municipalities establish and enforce buffer, landscape, and tree ordinances to ensure developers replace what they remove.

Unfortunately, there are several trends which many in the tree industry recognize as future problems. Evenly aged stands of trees, low species diversity, and poor tree siting and planting will lead to issues that will be very costly for taxpayers and municipalities in the future. In fifty to eighty years, urban forests in many metro areas will begin to mature and decline.

In Georgia, many counties like Cobb and Gwinnett have grown rapidly in the last twenty years. Millions of trees have been planted in the last two decades in subdivisions and cities making mostly the next generation of the urban forest evenly aged. In urban settings, the lifespan of a tree is much shorter than in forest situations. Fifty to eighty years is the general lifespan expectation of an urban tree such as an oak. Trees like maples and elms may have an even shorter lifespan.

There is very little seedling regeneration in urban areas due to landscape management practices such as mowing and weed control. Generally, the only regeneration that occurs in urban areas is in abandoned or unmanaged areas, and these spaces tend to fill with undesirable nonnative invasive weeds and trees.



Urban areas tend to lack the ecosystems needed to regenerate healthy forests: Many areas are overrun by exotic plants—such as kudzu—because they are better adapted to urban sites.

Urban forests are unlike natural forests in that there is very little species diversity. One can scan through any number of tree nursery catalogs and see that everyone is selling the same mix of trees. Red maple, willow oak, Chinese elm, sugar maple, and Leyland cypress are standard fare for nurseries and landscapers. Furthermore, most trees in urban areas are planted by landscape professionals and homeowners with a tendency to plant the same 30 or so tree species.

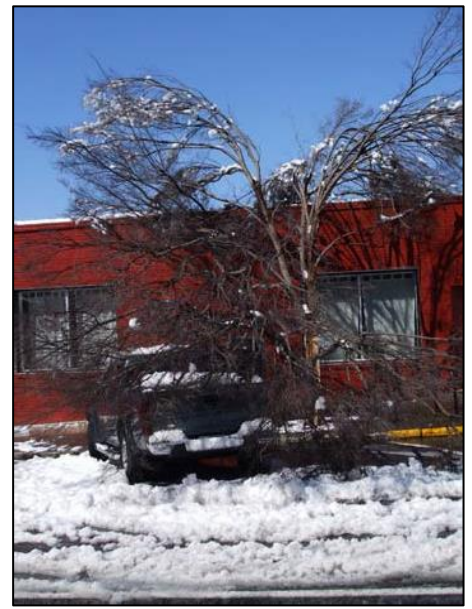
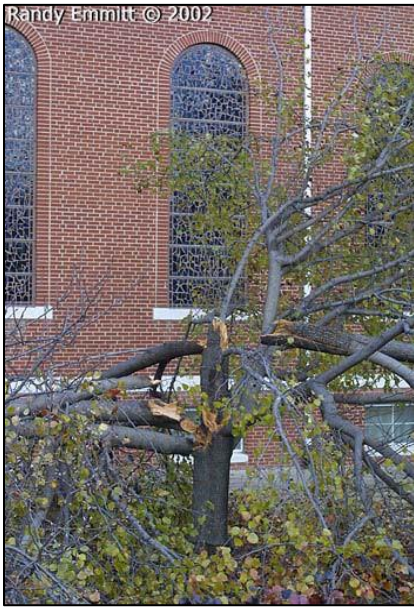
According to Larry Morris, Associate Chief, Former Sustainable Forestry Community Program with Georgia Forestry Commission, "I think Elm and Bradford pear trees are very good illustrations of the dangers in planting monoculture species. Urban forests need the diversity of tree species for the same reason that rural forests thrive with a mixture of different trees; they are less susceptible to insect and disease attacks that would affect the entire forest. "Many pathogens attack one genus/species of tree rather than a multitude," Morris says. "An example is Dutch elm disease. The American elm was widely planted as a street tree in the early-mid 1900's. Then the elm bark beetle and Dutch elm disease became prevalent and changed the face of many communities by killing over the course of a couple of decades a majority of the elms planted as street trees. "



A lack of species diversity can be fatal to an urban forest. Shown above are pictures of a suburban Detroit street before and after the onset of the Dutch elm disease.

There are other examples of tree problems that hit closer to home. For example, the Southern Pine Bark Beetle or SPB attacks southern yellow and white pines but not other coniferous or deciduous trees in the landscape. Another example is redbud, crapemyrtle and Japanese maple being widely killed by the Asian ambrosia beetle. Some species are more affected by nonliving environmental factors than are other species. The Southern red oak and the Northern red oak in the landscape are very susceptible to prolonged drought. Dogwoods are very susceptible to drought and heat stress that often leads to attack by dogwood borers.

Many varieties are touted as "ideal" landscape trees early after their introduction from the horticultural industry, only to find out later that they have long-term problems that no one expected. Bradford pears for instance, were found to have defective branching structure that tends to split apart during storms as they grow older. After planting millions of Leyland cypress across Georgia, we discover they are affected by four different commonly-found diseases.



Nursery favorites are not always the best choice for every landscape. In the cases above, bradford pears, leyland cypress, and Chinese elm have all failed to live up to their early expectations.

Now is the time to address the low species diversity in America's metro areas. Environmental educators should be informing the green industry of the dangers of low species diversity and landscapers and tree farms should be encouraged to broaden their tree selection. The more diverse our tree population is, then the less likely the chance that a single pathogen, insect, or genetic defect will decimate the landscape in the future.

Submitted By:
Steve Pettis
Complete Horticultural Consulting, LLC.