

Overplanting Native Trees Species: How Not to Prepare for the Next Major Calamity

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It is generally accepted that tree species diversity in the city should be maintained and is important in order to reduce the chance of a catastrophic, species specific disease or pest outbreak (Raupp et al., 2006). In 1975, Barker recommended that no single species should make up more than 5% of the total species richness. Moll (1989) suggested a guideline for maximum diversity in urban forests at no more than 5% of any one species and no more than 10% of any one genus. In 1991, Miller and Miller proposed that Barker's recommendation be modified to no more than one species comprising more than 10% of total species richness. A more encompassing approach was proposed by Santamour (1990), with no more than 10% of any one species, no more than 20% in any one genus and no more than 30% from any one family should be planted. A different approach was taken when Richards (1983, 1993) proposed that a species may be considered overused if it is often planted where other proven species are likely to be better suited. All of these guidelines are based on street trees and do not take into consideration the trees in private yards that make up the majority of urban forests (Moll and Kollin, 1993; Clark et al., 1997).

The most conservative percentage for being considered an overplanted species is 5% of the total urban forest. Of the species in this study that would be considered overplanted, many of them, 89% are native to North America. Organizations (Native Plant Society of America), State Departments of Natural Resources (North Carolina, Texas, Maryland, etc.) and State Cooperative Extension Services (Ohio, Hawaii, Florida, etc.) suggest planting native trees. The main reason given for the "go native" agenda is to help control the spread of invasive plants that may alter or impact the native environment in an adverse way. I recommend that these organizations should suggest planting proven native trees in the urban forest before using exotics. There is an assumption that native species are best because they have evolved in or acclimated to that area. The pool of proven native trees has been narrowed over the years, and there is a reliance on fewer native tree species which are now becoming overplanted. The selection of proven native trees should be broadened so that native species are not overplanted. Another consideration that needs to be explained is what exactly is a native species? To most, native means it grows naturally in North America or in the United States. Some would say it is native if it is found in the Midwest. But a more conservative definition for being a native tree would be one that grows in the vicinity or region of the city.

In 1980, 27%, and in 2003/2005, 42% of the tree taxa were considered overplanted. This indicates that we are relying on fewer tree species today than we were in 1980. In 1980, silver maple (*Acer saccharinum*), blue spruce (*Picea pungens*), crabapple (*Malus sp.*), and ash (*Fraxinus sp.*) made up more than 5% of the total tree composition in the urban forest. In 2003/2005, Arborvitae, silver maple, Norway maple, blue spruce, ash and Norway spruce each made up more than 5% of the total urban forest. When considering the public trees, there were

eight different species on public property that comprised more than 5% of the tree composition in both 1980 and in 2003/2005. On private property, in 1980, four species comprised more than 5% of the total private tree composition, and in 2003/2005, six species made up more than 5% of the private tree composition.

When comparing the genera found in the urban forest, it is apparent that *Acer* is overrepresented. In 1980, *Acer* made up over 22% of the total urban forest and in 2003/2005 it was 24% of the total. Of the public trees, the genus *Acer* is even more overrepresented. In both years, 1980 and 2003/2005 *Acer* represents nearly 40% of the public trees. The amount of *Acer* on private property is similar to the amounts in the total trees. In 1980, *Acer* was almost 20% and in 2003/2005, *Acer* was just over 21% of the private trees. There are very good reasons for avoiding mass plantings of the same species and genera; e.g. American elm (*Ulmus americana* L.) with Dutch elm disease and ash with emerald ash borer (*Agrilus planipennis* Fairmaire) are two examples. It seems that the genus *Acer* has replaced the American elm (Wade, 2010) as being overplanted and may now be waiting for a calamity to happen, e.g. Asian longhorned beetle (*Anoplophora glabripennis* Motschulsky). If it becomes established in these Midwest cities, it would dramatically change the urban forest by decimating about 24% of the trees.

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List of species that may be considered overplanted by being more than 5% of the total species composition in select Midwest cities in 1980 and 2003/2005.

Total Urban Trees			
1980		2003/2005	
Silver Maple	10%	Arborvitae	9%
Blue Spruce	7%	Silver Maple	9%
Crabapple ²	5%	Norway Maple ¹	7%
Ash	5%	Blue Spruce	6%
		Ash	6%
		Norway Spruce	5%
Total	27%		42%
Public Urban Trees			
1980		2003/2005	
Sugar Maple	14%	Ash	19%
Silver Maple	13%	Norway Maple ¹	13%
Ash	11%	Sugar Maple	12%
Crabapple ²	10%	Silver Maple	9%
Norway Maple ¹	7%	Pin Oak	6%
Pin Oak	7%	Linden ^{2,3}	6%
Elm ²	7%	Pear ¹	5%
Red Maple	5%	Red Maple	5%
Total	74%		73%
Private Urban Trees			
1980		2003/2005	
Silver Maple	10%	Arborvitae	10%
Blue Spruce	7%	Silver Maple	9%
Elm	5%	Blue Spruce	7%
Ash	5%	Norway Maple ¹	6%
		Norway Spruce ¹	5%
		Crabapple ²	5%
Total	27%		41%

1 Not a native to the USA

2 Some species may not be native

3 Most trees were *Tilia cordata*