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The green infrastructure – the nurturing (city) forest

By Patrick T. Reardon on Fri., 09/25/2009 –8:57 am.

Fourth of four

When I was growing up in Chicago in the West Side neighborhood of Austin, it was clear to me what a city was and what a forest was.

A city was a dense concentration of homes, streets, bridges, skyscrapers, highways, sidewalks, office buildings, alleys, factories, warehouses, el tracks, subways and people. It was often crowded, often noisy. It had a constant nervous energy, even in the middle of the night.

A forest was somewhere far away. It was all these trees and hills and rocks. It was also kind of a scary place. It was where wild animals lived. On a school field trip to a forest, I'd walk off down a path, and there would be no one around. It would be quiet, very quiet, except for the gurgle of a small stream or the call of a bird to another. And very still. It made me nervous.

Yet, without realizing it, I was living inside a forest --- an urban forest.

Tall imposing trees

Outside our home on Leamington Avenue was a tree, and, to the north and to the south, Leamington was lined with other tall imposing trees. As a city kid, I didn't know what kind they were. Based on a recent study of Chicago's trees, the ones on Leamington might have been silver maples, or American elms, or white ashes, or some mix of those and other species.

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We took them for granted. They provided a canopy of shade on the bright, brutal 90-degree days of summer. And, in the fall, we'd gather up their leaves into large piles which we'd turn into fragrant bonfires. (This, of course, was before those bonfires were banned as air pollution.) In the winter, the stark bare branches and trunks of our trees were a poetic reminder of Nature's cycle of dearth and plenty, life and death.



Today, in an era of heightened environmental awareness, there is a growing recognition that those trees do even more --- that they're an essential part of the green infrastructure.

The green infrastructure is the name that's now being used to describe the vast network of natural areas throughout the Chicago metropolitan region, ranging from forest preserves to prairies, from rivers to meadows, from lakes the backyard gardens.

It's like the "gray" infrastructure --- the streets, water pipes, highways, utility lines, sewers and such --- in two ways: (1) it does a lot of work for humans by cleaning the air and water and reducing flooding, and (2) it only works if it's interconnected.

"One of the city's most important assets"

In a soon-to-be-released report, Mayor Richard M. Daley, who boasts of planting half a million trees during his 20 years as the city's chief executive, writes, "Our urban forest...is one of the city's most important assets."

Indeed, he says that its value is increasing in the face of global warming: "Expanding and maintaining the forest can help us both mitigate climate change, by absorbing carbon dioxide, and adapt to it, by helping to cool the city."

A first step has been to learn how big the forest is right now and what benefits it provides.

Working with the city, the Chicago Park District and consulting firm of WRD Environmental, the U.S. Forest Service conducted a survey of Chicago's urban forest in

2007. In a draft report of its findings, the Forest Service says that the city has 3,585,000 trees.

The top 10 urban forests

A draft study, completed by the U.S. Forest Service, the City of Chicago, the Chicago Park District and WRD Environmental, lists the top 10 urban forests in North America:

- (1) Calgary --- 11.9 million trees
- (2) Atlanta --- 9.4 million trees
- (3) Toronto --- 7.5 million trees
- (4) New York --- 5.2 million trees
- (5) Chicago --- 3.6 million trees
- (6) Baltimore --- 2.6 million trees
- (7) Philadelphia --- 2.1 million trees
- (8) Washington --- 1.9 million trees
- (9) Boston --- 1.2 million trees
- (10) Woodbridge, NJ --- 1 million trees

That's more than one tree for every man, woman and child who lives in Chicago.

According to the draft, the tree canopy covers 14.6 percent of the cityscape. But Aaron Durnbaugh, a deputy commissioner in the city's Environment Department, says it's most likely even higher.

In 1993, he says, the tree cover was 11 percent. The 14.6 percent figure dates from 2003. Today, he estimates the tree cover may be over 16 percent.

Durnbaugh says that the study found that Chicago's urban forest removes 754 tons of particulate matter --- the microscopic bits of soil, metals, acids, chemicals and dust --- from the air each year. If the city were to use machinery of some sort to do the same task, it would cost \$6 million annually.

In addition, about 25,200 tons of carbon are taken out of the city's air every year by the three million-plus trees, for an annual savings of \$521,000.

All that carbon adds up. After decades of taking carbon out of the air, the urban forest has stored up an estimated 716,000 tons of carbon. To remove that amount from the air would cost \$14.8 million.

The top 10 Chicago trees

- (1) White ash --- 6 percent
- (2) Mulberry --- 5.2 percent
- (3) Green ash --- 4.9 percent
- (4) Tree of heaven (Chinese sumac) --- 4.7 percent
- (5) Silver maple --- 4.6 percent
- (6) American elm --- 4.5 percent
European buckthorn --- 4.5 percent
- (8) Norway maple --- 4.0 percent
- (9) Honeylocust --- 3.3 percent
- (10) Littleleaf linden --- 1.5 percent

Source: A draft study, completed by the U.S. Forest Service, the City of Chicago, the Chicago Park District and WRD Environmental.

“The trees collect particulate matter. They collect carbon. They shade,” says Durnbaugh. “In providing shade, they can cool a house so you have reduced cooling costs.”

Still up in the air is the question of whether the trees provide a net energy savings for property owners or a net cost, according to Durnbaugh. While shade in the summer can cool homes, there is a theory that the branches and trunks of trees block the sunshine in winter that can help warm a home. Durnbaugh says he’s skeptical about that idea.

“Turf is not great”

Trees, though, aren’t the only elements of the green infrastructure in Chicago. Suzanne Malec-McKenna, the head of the city’s Environment Department, says it also includes cemeteries, golf courses, rail corridors and boulevards.

“We want to make our green space work harder for us,” she says. “We want to use the environment and natural processes to serve in the same function as our hard infrastructure would, our pipes and such.”

How can a cemetery or a golf course work harder?

“You can make them more permeable,” she says. “Turf is not great. It doesn’t have a deep roots system. That’s why it goes brown oftentimes in the summer.”

A solution could be to replace some lawns with native grasses. Obviously, not on the greens or fairways at a golf course or the baseball fields in a city park, but Malec-McKenna said it might be possible to get rid of

“unnecessary turf, turf that’s not being used for recreation. That could become a meadow.”

Maybe kids growing up today in Chicago won’t think, as I did, that forests and Nature are somewhere else. Maybe the growing talk about the urban forest and the region’s green infrastructure will help them to recognize the natural treasures right outside their doors.

And maybe the action that results from all this talk will make the lives of those children healthier, more beautiful and less expensive.

They --- and we --- after all are part of the green infrastructure, too.