Shade Crusade: Why City Trees Are Good Medicine

Written by Sandra Hines

A shopping blog for “green, eco-friendly pet owners” features a dog collar made from recycled inner tubes and lined with silver seatbelt material.

A so-called “eco-luxury” vodka uses only locally grown grain and comes in a bottle of recycled glass for what the Missouri distiller says is, a “vodka with a green state of mind.”

And now you can go green to the grave with biodegradable coffins. It’s composting at its best, says the owner of Natural Burial in Portland, Ore., which sells products like the Ecopod, a kayak-shaped coffin made out of recycled newspapers.

Seems like everything and everybody is going green these days.

But where is the green going? American Forests, a Washington, D.C., nonprofit, found that America’s largest cities have lost more than a quarter of their tree canopies since 1972. In Seattle, the city’s urban forester Mark Mead, ‘82, ’87, says that 18 percent of the city has canopy cover, down from 40 percent just 35 years ago. That’s about half of what is recommended for a city of its size, according to American Forests.

“If we don’t have urban green in our surroundings, our lives are diminished,” says Kathleen Wolf, a research scientist with the University of Washington’s College of Forest Resources. “And it’s usually taken for granted until it’s gone.”

Urban forests provide many obvious benefits. When rains inundate cities, as they did in western Washington this winter, trees and green spaces help reduce stormwater runoff. One study found that the canopy of a single, leafy, 38-foot-tall tree intercepts and holds rainwater, reducing runoff by 290 gallons.

Urban tree canopies and green spaces also remove pollutants from air and water, soak up the greenhouse gas carbon dioxide and provide cooling shade for concrete-laden cityscapes. Scientists estimate that a mature tree canopy in a city center, for example, reduces air temperatures up to 10o F and can even influence indoor temperatures of nearby buildings.

Along with the environmental gains, there are other benefits less obvious to the casual observer: studies show that urban greenery makes us healthier and happier, says Wolf, who is an environmental psychologist.

• In one study, scientists put their subjects through stressful mental exercises and then showed them images of nature or urban environments without any green. During the tests, they measured physiological responses such as heart rate and blood pressure. The subjects who looked at nature shots had lower
UW Research Scientist Kathleen Wolf is looking for a way to assign a dollar value to the health and psychological benefits of urban greenery. Photo by Mary Levin.

stressed than those exposed to urban images, and their

• Environmental psychologists looked at two parts of a public housing site in Chicago: one with more trees, grass and plants than the other. The “green” housing area had fewer domestic disputes, lower levels of fear, less crime and better relationships among neighbors.

• Greenery even affects how we see the world. Jenna Tilt, ’01, asked her subjects to estimate the walking distance in settings with lots of greenery and settings with less green. If the neighborhood has more street trees and other plants, people judge walking distances to be less, even if the distances are the same in both settings. Why is that important? If you feel that it’s easy to walk someplace, you just might be more inclined to do so, something that’s important in the face of the mounting medical costs of inactivity and obesity among Americans.

• A Japanese study looked at elderly people living in high-density Tokyo. The elderly with green in their neighborhoods were, during a five-year period, healthier and had a lower mortality rate. The researchers controlled for such things as age and the health of participants at the start of the study.

“To me this is very exciting,” Wolf says. “It means in green environments, where people are able to walk about, you get the recommended moderate-activity levels and health benefits.

“If we don’t have contact with nature on a daily basis, we become more stressed, less able to focus on tasks at work and at school. We need green around our homes, schools, places of business.”

Wolf’s research in central business districts, for example, found people were willing to pay more—up to 12 percent more—for the same products if the business district had large trees. Not only were customers willing to pay more, they judged the merchants to be more helpful and the products to be of higher quality.

Currently Wolf is looking for a way to assign a dollar value to these health and psychological benefits. Environmental psychologists need help from economists to do that, says Wolf, who has submitted a grant proposal to tackle the question.

There’s a pressing need to understand the economics because saving trees is not going to be easy as cities become denser. Infill development is a way to concentrate housing in existing urban areas to avoid sprawl and ever-longer commutes. But setting aside land for trees could make housing even pricier.

“We’re all for trees, and we think they make communities more livable; the problem is with regulations that take away inventory for buildable lands,” Tim Harris, an attorney with the Building Industry Association of Washington, said in a Seattle Post-Intelligencer article.

In a blog about efforts to save urban trees, one citizen wrote, “Can the tree huggers just hug the trees on their own property where they pay the taxes and just leave the rest of us alone?” Another wrote, “Pack houses into small areas and oh, by the way, save room for trees and make the houses affordable? When is the next election?”
Having the economic benefits in dollars and cents would make the case for urban trees and green more compelling, Wolf says. We already know there’s an economic value when someone increases their physical activity: A study in 2000 said that annual mean medical costs are reduced by $865 per person when inactive adults engage in regular moderate activity.

What needs to be determined is just how much green spaces contribute to people’s motivation to head out for a walk, ride a bike or go for a run. Knowing just what increment of that motivation can be attributed to the landscape would give researchers a way to assign a dollar value to that contribution.

Even while awaiting the economic studies, the importance of health and social benefits from green spaces is beginning to be incorporated into building and community planning.

For example, the organizers behind LEED—the Leadership in Energy and Environmental Design certification process for green buildings—are partnering with those participating in a Sustainable Sites Initiative to better develop the sites around such buildings. There are some standards now but they’re considered weak by those in the field. More thought needs to be given to the environment around the buildings, not just the environment within them, Wolf says.

Wolf and colleagues across the nation have been considering the amount of vegetation and how to manage water and other materials on the grounds of buildings. Because of her involvement, the goals for sites were recently expanded to recognize environmental psychology. A new human well-being subcommittee will be formed, the first group of its kind in the nation, and Wolf will be a leading member.

While Wolf’s research is about “why” green is important, others are busy with the “how.”

Over in the UW’s Green Futures Research and Design Lab the talk is about how to preserve and enhance “green infrastructure.” If roads, sewer systems and bridges are examples of gray infrastructure, then open spaces, parks, wetlands—even ditches and gardens in parking strips—are examples of green infrastructure, according to Nancy Rottle, associate professor of landscape architecture and director of the UW Green Futures lab.

It’s all about helping communities understand how to plan for and establish green spaces. In a recent project, for example, the lab helped the community of Lake Forest Park, north of Seattle, with a 100-year legacy plan. Citizens and city officials determined the elements they would like to see in the future—habitat corridors, trails, parks and access to Lake Washington and streams in the area. Priorities were then set for the next six years with funding approved by the Lake Forest Park City Council.

“If you don’t plan for green infrastructure first, it’s much more costly to go back and do it once development has occurred,” Rottle says. “Seattle’s existing green-space framework, for example, was the result of visionary planning and acquisition 100 years ago that anticipated Seattle’s growth into a world-class city.” She hopes her lab’s faculty and students can help with the next 100 years.

The need is pressing. In her own neighborhood she says she’s seen eight-plex after eight-plex going up, mowing down every tree in the process.

That’s something Wolf’s students also noticed.

“Students are always out there and so they see things we may not be paying attention to. About five years ago students started saying, ‘We’re losing big trees in the cities.’” Wolf is talking about trees with trunks bigger than 12 inches across.

“I didn’t really pay attention to it but now it’s becoming an issue in the arborist and urban forestry community in the state. As we do infill
development, what we’re left with are tiny spaces where only tiny plants can exist. With real estate values escalating, it’s much more difficult to convince the public to acquire spaces for green.”

The Evergreen State has a spotty record with its urban forests says Wolf. Robert Corletta, ’02; Noel Studer, ’03; and Sean Dugan, ’04; conducted statewide assessments for the Washington Department of Natural Resources since 2000 that found:

- Only 10 percent of communities had up-to-date tree inventories.
- Only 12 percent of communities had management plans; the rest don’t have clear goals and objectives for tree care.
- About 20 percent of communities do routine tree care; the challenges include poor pruning practices and failing to replace trees where they have been removed.
- While 47 percent of communities have tree ordinances, many reported needing better enforcement.

“Communities are trying but their efforts are often hit-or-miss and money is not consistently budgeted,” says Wolf, “Part of the problem is that when you say ‘nature,’ people tend to think about the Cascades or the Pacific Coast. They don’t realize the incredible value of nature niches in our cities.”

She points to one of the nature niches on the UW campus, the popular Medicinal Herb Garden, where Steve Brueggerhoff, ’01, surveyed people about what they learned there. Other than formal class groups, what he discovered was that people were at the herb garden not to study plants but rather as a respite from sitting in their offices.

They went there and claimed it enhanced their productivity when they went back to their desks,” Wolf says. “That’s what we humans need in urban settings to function at our very best, to optimize our abilities.

“There’s a peril in ignoring this for individuals and entire communities.” • Sandra Hines is a science writer for UW News and Information.

Purple and Gold and Green
The UW is one of the premier research institutions in the nation, so it is only natural that it is playing a key role in environmental initiatives at the international, state and campus levels. Here is a sample of recent UW contributions:

- Last fall when the Intergovernmental Panel on Climate Change (IPCC) and former Vice President Al Gore were awarded the Nobel Peace Prize, more than 50 UW faculty, affiliate faculty and students could claim a part of the credit. They served as lead authors, contributing authors and reviewers for the IPCC’s major reports over the years. “As the wording of the Nobel Prize citation emphasizes, it is not just having the scientific knowledge, but also getting public understanding and affecting policy that will alter the outcomes of our changing climate,” says Arthur Nowell, dean of the College of Ocean and Fishery Sciences. “UW scientists, policy experts and analysts have been important players in all three aspects from the oceans, the atmosphere and the policy dimensions.”

- In the midst of International Polar Year, UW researchers conducted projects on the ice near the North Pole, camped beside some of the Earth’s greatest glaciers and published papers about startling changes detected in the Arctic. “The UW’s expertise in polar sciences includes some of the leading oceanographers, atmospheric scientists, glaciologists, biologists, chemists and computer modelers in the nation,” says Dick Moritz, director of polar sciences at the UW’s Applied Physics Laboratory.

- The state has asked the UW’s Climate Impacts Group to conduct the most comprehensive assessment of the impact of climate change on Washington. Among other things, the study includes the first statewide look at how climate change may affect the health of residents—for example, by potentially increasing the incidence of West Nile virus or Lyme disease, according to Edward Miles, professor of marine affairs and director of the Climate Impacts Group. The project also marries the UW’s climate tools with Washington State University’s agricultural expertise to create the most detailed examination ever of how climate change might affect agriculture here.
• At the campus level, the UW was one of six institutions achieving an overall grade of A- or better on a report card issued by the Sustainable Endowments Institute which considered 200 universities in the United States and Canada. The institute said that since his arrival, President Mark A. Emmert, ’75, has created an Environmental Stewardship Advisory Committee and an environmental stewardship coordinator position. The President has also formalized a policy focused on campus sustainability. Among other things, the institute noted that the UW has been working on energy conservation measures since the 1980s and all of the Seattle campus’s electricity purchases are from renewable and carbon-neutral sources.

• Also last year, Emmert committed all three UW campuses to minimizing global warming emissions and integrating sustainability more firmly into the curriculum when he signed onto the Leadership Circle of the American College & University Presidents Climate Commitment.—Sandra Hines