



## SEEING THE FOREST AND THE TREES

Why our city trees matter



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Yosemite Avenue in Mountain View



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By Catherine Martineau and Anwyn Hurxthal

The clearcutting of holly oaks on Palo Alto's California Avenue shocked and angered the community. Cement, blinding sun, and shimmering heat replaced the dark green trees that had graced the street just the day before. Suddenly, trees became the talk of the town. The City of Palo Alto, local businesses, neighborhood associations, nonprofits, and residents found themselves caught up in a maelstrom of laments, accusations, denials, and apologies about the sudden loss of the sixty-three oaks. Bitterness was evident as the community realized how much it cared about its trees.

We miss our trees profoundly when they're gone, yet we often take them for granted. Trees are easy on the eyes and transform urban areas into more balanced human habitats. Despite this, most of us are unaware of how our urban trees get where they are and survive urban life. The quiet coexistence of our leafy neighbors is a mystery to most of us. When urban trees are felled, we lose more than urban adornment: we eliminate valuable natural air conditioners and filters, water purifiers, shade pro-

viders, and habitats for urban wildlife. Trees may not always be the best neighbors—people take issue with their pollen and falling leaves and fruit—but a barren urban landscape is the alternative. While our enjoyment of urban trees comes naturally, they are a public utility and a community resource that we need to learn to manage accordingly.

#### Bay Area urban forests

Flying into SFO, the blues and greens of San Francisco Bay waters and surrounding forests stand out from above. The area's nine counties contain more than 200 municipalities and a growing population of approximately 7.3 million people. This already large Bay Area population is projected to increase by about 2 million people over the next thirty years. More people means more urban development: increased air pollution from traffic; higher energy use; more hard, grey surfaces with greater amounts of contaminants flowing into bodies of water; and more buildings, streets, and parking lots increasing ambient temperatures and boosting ozone formation. We live in a vibrant, booming region with limited space.

Trees offset some of the harsh effects of our growing cities. Science shows that trees improve air quality and public health, help conserve energy, increase land values, reduce storm-water runoff, and recharge groundwater.

"Although any single tree benefit may be small, the sum of benefits is significant when it comes to mitigating the environmental impacts ... from converting natural land cover to built environments," explained Greg McPherson and Jim Simpson in *San Francisco Bay Area State of the Urban Forest Final Report*, their 2007 report for the Center for Urban Forest Research.

Unfortunately, the Bay Area's urban forests are dwindling. A recent report found that between 1984 and 2002, a population increase of 30 percent has driven a 73 percent increase in urban areas. While there's been a 17 percent increase in "grey infrastructure" such as buildings, roads, and asphalt, the "green infrastructure" has increased by only 10 percent. Trees aren't keeping up with the blacktop. Palo Alto's street trees are on the decline, too. The city's maturing canopy requires regular tree removals, but replacement trees aren't being planted at the same rate.

Photo by Emma Hoare



The Bay Area is one of the largest metropolitan areas in the United States. We're blessed with substantial urban forests, and our management of urban trees could set the standard for the state and the rest of the country. Canopy is strongly advocating that the City of Palo Alto complete and implement an urban forest master plan, which could become a model for surrounding communities.

"The challenge ahead is to better integrate the green infrastructure with the gray infrastructure," stated Greg McPherson and Jim Simpson in their 2007 report, "by increasing tree planting, providing adequate space for trees, adopting realistic tree canopy cover targets, and developing strategies, plans, programs, and municipal assessments ... thereby perpetuating a resource that is both functional and sustainable."

The tree removals on California Avenue illustrate just how important it is for city staff to have clearly defined strategies and plans for managing trees.

### Urban forestry: a science and an art form

Tree care is far more complex than most people imagine. Arboriculture involves tree planting and care; long-term inventories and histories of thousands of individual trees; in-depth knowledge about individual tree species in urban environments and the many stressors they suffer; an understanding of the long-term growth habits and behaviors of specific trees; quantifying and maximizing the benefits of trees; minimizing costs; educating the public about trees; obtaining and maintaining public support and funding; and establishing laws and policies for trees on public and private land. For the urban arborist, it involves working with limited root and canopy space; widely varying amounts of water and light, poor soil, heat, and pollution; mechanical and chemical damage to trees; and the mitiga-

tion of tree-related hazards. All of this in addition to dealing with human gripes—pollen, falling leaves, messy fruit, leaf color, crown shape, and wandering roots—is no simple feat.

Now an integral part of our urban infrastructure, trees are quite dependent on us for planting, care, and growth. The decisions we make about species, placement, and care can result in the life or death of a tree. The science of arboriculture and urban forestry has evolved impressively over the last ten years, but the challenges in growing urban trees are increasing as well. At one time, Stone Pines seemed an obvious selection for road medians; however, now we know they'll literally lift up the street. Higher density in urban areas means less space for trees, because cities experience increased pressures to convert green spaces into building sites. Harsh growing conditions make tree survival increasingly difficult. In fact, street trees in a downtown area have an average lifespan of only about seven years, while in a suburban area they live for about thirty-two years. A host of tree-care issues—poor tree nursery stock, inappropriate species selection, bad planting techniques, and inadequate long-term care—can all lead to a tree's demise. The fact that few communities have working tree inventories and urban forest management plans means that there's little oversight and no big-picture management of the urban forest. Finally, and perhaps most importantly, the public's level of knowledge and involvement has a great impact on urban trees. Residents play a pivotal role caring for the trees around their homes.

A healthy urban forest is teeming with human, as well as animal, life. There are many human players in the life of an urban forest: municipal and commercial arborists, municipal and utility foresters, environmental policymakers, city planners, urban forestry

organizations, consultants, educators, researchers, landscape architects, contractors, gardeners, residents, and community activists. The clearcutting on California Avenue made it particularly clear that everyone plays a part in keeping our urban forest alive. The involvement of city staff in a forest management plan is critical. The community's involvement in daily management and safeguarding the forest plan is vital. Nonprofit organizations, such as Canopy, represent the community and contribute valuable third-party expertise and guidance to city tree projects. The day-to-day care that residents and local businesses provide is critical.

### Why city trees matter: urban trees are valuable

The contributions trees make to the environment are often referred to as ecosystem services. Science shows that these services are tangible and numerous.

#### Climate

- Trees act as a carbon sink by removing the carbon from CO<sub>2</sub>, storing it as cellulose while releasing oxygen back into the air. A healthy tree can absorb forty pounds of CO<sub>2</sub> per year. This helps prevent global climate change.

- Trees help counter the "heat island" effect in our cities. Patches of heat result from concrete, steel, and asphalt storing thermal energy. Heat islands can be up to ten degrees warmer than the surrounding areas. Trees can prevent heat islands from forming with their shade and reduce the air temperature in these areas through transpiring (evaporating water).

#### Energy

- Deciduous shade trees planted near homes and businesses can lower energy usage by up to 30

## Simple tree care tips

**The best way to start caring for your urban forest TODAY is to tend to the trees right outside your front door.**

- Water mature trees deeply every month during the dry season (except for mature native oaks that actually suffer from summer watering).
- Water your young tree once a week: fill a watering basin with ten gallons of water or let a hose trickle near it for several hours.
- Don't put decorative rocks or plants around the root crown (base) of your tree. They compact the soil, cultivate microbes and insects that could infect the trunk, and can compete for water and nutrients. Instead, apply mulch.
- Beware of nicking or injuring your tree's trunk with lawnmowers or weed-wackers. Bacteria and microbes can enter and make the tree sick.
- Be very cautious about pruning your tree. Improper cutting can cause infection, destroy a tree's natural form, weaken it, and result in poor health and premature death. Don't top trees. Cutting major limbs and leaving stubs injures and disfigures trees, making recovery impossible.
- Hire an arborist to check up on your trees every few years.

## Support your local nonprofit urban forestry organization

Atherton Tree Committee (Atherton)  
[www.ci.atherton.ca.us/treecommittee.html](http://www.ci.atherton.ca.us/treecommittee.html)

Canopy (Palo Alto and East Palo Alto) | [www.canopy.org](http://www.canopy.org)

City Trees (Redwood City) | [www.citytrees.org](http://www.citytrees.org)

Friends of the Urban Forest (San Francisco) | [www.fuf.net](http://www.fuf.net)

Magic, Inc. (Stanford) | [www.ecomagic.org](http://www.ecomagic.org)

Mountain View Trees (Mountain View) | [www.mountainviewtrees.org](http://www.mountainviewtrees.org)

Our City Trees (San José) | [www.ourcityforest.org](http://www.ourcityforest.org)

Trees for Menlo (Menlo Park) | [www.treesformenlo.com](http://www.treesformenlo.com)

## Learn more about trees and urban forests

California ReLeaf | [www.californiareleaf.org](http://www.californiareleaf.org)

California Urban Forests Council | [www.caufc.org](http://www.caufc.org)

Center for Urban Forest Research | [www.fs.fed.us/psw/programs/cufr](http://www.fs.fed.us/psw/programs/cufr)

International Society of Arboriculture | [www.isa-arbor.com](http://www.isa-arbor.com)

Trees Are Good | [www.treesaregood.com](http://www.treesaregood.com)

Urban Forest Ecosystem Institute | [www.ufe.calpoly.edu](http://www.ufe.calpoly.edu)



2009 Canopy.org Arbor Day Event

## How to get involved

- 1 Learn about trees: Identify the trees around your home, go on neighborhood tree walks offered by urban forestry nonprofits, attend environmental workshops, and take tree classes.
- 2 Join your neighborhood group or association: Keep your ear to the ground about neighborhood construction projects. Bring awareness to the value of trees.
- 3 Connect with your local urban forestry nonprofit: Sign up for e-mail updates. Better yet, volunteer or donate.
- 4 Get informed about city activities: Go to your city's Web site, sign up for e-mail updates, attend city meetings, and be aware of your community's tree ordinance.
- 5 Plant trees: Plant lots of trees and create neighborhood tree diversity.
- 6 Plant trees strategically: Avoid trees to the north of your home—west is best. Think about shade placement and make space for tree growth.
- 7 Choose trees wisely: Choose drought- and pollution-tolerant species. Bigger is better for the environment, so choose large, long-living trees with lots of surface area.
- 8 Care for existing trees: Learn about the individual needs and preferences of the tree species around your home.

percent, which means lower carbon emissions and substantial cost savings.

- Acting as a natural air conditioner, a lush tree canopy ensures that summer temperatures are at least six to eight degrees lower than in comparable neighborhoods without trees.

### Water

- The increase in hard surfaces in urban areas leaves few places for storm-water to flow. Without trees, cities would need to increase sewage and storm-water drainage channels and waste treatment capacities to handle increased water runoff.

- Trees slow storm-water runoff by capturing and intercepting rainwater with their leaves. A nine-year-old Bradford Pear tree, for example, can retain fifty-five gallons of water.

- Tree roots filter water, preventing chemicals from flowing into streams while helping water penetrate the soil to recharge groundwater resources.

goods and services we buy. Studies reveal that the presence of trees and landscaping in retail environments influence shoppers' perceptions and, likely, their behavior. On tree-lined streets, people shop more frequently, stay longer, spend more money, and will even pay more for parking.

### Tree benefits in dollars and cents

A study of urban forests in Modesto, California, showed that for each dollar invested in urban forest management, \$1.89 in benefits was returned to residents. Modesto's city trees actually remove 154 tons of air pollutants, increase property values by over \$1.5 million, and provide shade that saves over \$1 million. This information convinced city officials to increase the tree budget and an electric utility company to invest in developing the Modesto Tree Foundation. Once in place, Palo Alto's urban forest master plan will involve a similar study on the benefits of trees.

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— Greg McPherson of the Center for Urban Forest Research

### Air

- Trees remove gaseous pollutants from our air by absorbing them. Trees absorb CO<sub>2</sub> and other greenhouse gasses and, in turn, replenish the atmosphere with oxygen.

- Evergreen trees planted in rows can capture up to 85 percent of the particulate air pollution blowing through their branches. Particulate pollution causes serious respiratory problems that can result in hospitalization, especially in children. Particulates are trapped and filtered by tree leaves, stems, and twigs.

### Infrastructure

- More shade means more time between repaving. With 20 percent shade on a street, pavement condition is improved by 11 percent—a 60 percent savings on resurfacing over thirty years.

### More benefits

- Trees provide habitats for urban wildlife.
- Trees strengthen communities and provide social, psychological, and aesthetic benefits. Research indicates the wide range of social benefits that are provided by experiences of “nearby nature” in cities.

- Trees improve real estate values. Healthy trees can add up to 15 percent to residential property value. Office and industrial space in a tree-filled setting is more coveted by prospective buyers and renters.

- As shoppers, we all know that we're as interested in our shopping experience as we are in the

### Urban forestry organizations: forest growers and guardians

“The urban and community forestry paradigm has shifted,” said Greg McPherson of the Center for Urban Forest Research, “from focus on beautification to one that encompasses all of the environmental, conservation, economic, and social benefits of community trees.”

Urban forestry organizations are the nonprofit caretakers of city forests and community trees. Often bridging the divide between residents, city staff, and local businesses, these organizations are charged with protecting and growing trees. They're also faced with the challenging task of advising the institutions and individuals actually responsible for the trees. Quite often, these tree owners don't have the best interests of the entire urban forest in mind.

Canopy plants, tends, and grows urban trees in Palo Alto and East Palo Alto. The organization teaches kids, residents, and city officials about the vital role that urban forests play in cleaning our air, cooling our streets, and filtering our water. In the past year, Canopy worked with over 1,200 students and residents during more than forty educational tree activities to educate residents and preserve, protect, and care for Palo Alto and East Palo Alto's urban forests. Last year, Canopy staff and volunteers planted 352 trees, cared for over 2,000, and advocated for the urban forest with both local and state governments. For more information about Canopy, please visit [www.canopy.org](http://www.canopy.org).

*Catherine Martineau is the executive director of Canopy. She grew up in Paris, where the urban forest is made up primarily of horse chestnuts. Anwyn Hurxthal is Canopy's communications and development manager. She grew up on Kenya's grasslands, where whistling thorn acacia trees dot the landscape.*

Photo by Dean Birinyi