



# The Healing Power of Trees

TREE CITY USA®  
BULLETIN

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James R. Fazio

*A n emotional attachment to trees is deeply ingrained in the human spirit. Whether it is a spiritual connection with something larger and unseen or a practical way to reduce stress and live a healthier life, urban foresters and tree boards would do well to recognize and build upon these important benefits.*

Who is not familiar with the good feeling that comes from a pleasant walk in the woods?

The noises of streets and people are left behind. The cares of work or personal problems are eased as focus shifts to the majesty of trees and their sweet essence fills the air. It is at once an escape and a refreshment of mind and spirit, the very meaning of 're-create' in recreation. The Japanese have another term for the leisurely woodland walk – 'forest bathing' – and research suggests that it goes beyond being an emotional experience or providing the benefits of exercise. It actually has a physiological effect that can bolster the immune system.

John Muir said of the woodland walk that it is "the clearest way into the universe" and promised that when you go to the forest "Nature's peace will flow into you as sunshine flows into trees." Muir and philosophers throughout the ages saw the healing potential of trees, whether in a wilderness, a sacred grove, an urban park or, like the poet Joyce Kilmer observed – a single tree "that looks at God all day, and lifts her leafy arms to pray."

Although most of us are not philosophers or poets, we all have a favorite tree or special remembrance of it. It was likely to have been part of a life-shaping experience in youth or part of treasured family memories. It may still be a place of solace or relaxation. In the pages that follow, read about what science is telling us of these connections with trees and green spaces – and how they can actually help heal us physically and mentally.



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# From Intuition to Scientific Fact

Humans have recognized a special connection with trees since the dawn of history. Every major religion includes trees in its earliest stories. The Egyptians had their sacred groves and the Bible mentions trees no less than 120 times. The Celts saw magical powers in trees that varied by species. Philosophers like Rousseau and Thoreau proclaimed moral value or goodness that comes from associating with trees and the outdoors. So did J. Sterling Morton, founder of Arbor Day, who said, “Children reared among trees and flowers growing up with them will be better in mind and in heart than children reared among hogs and cattle.”

As parks began to be established in American cities in the nineteenth century, efforts began at the same time to define just what these intrinsic values might be. Pioneering landscape architect Frederick Law Olmsted believed they improved the mental health of urbanites as more and more people left the more healthful countryside to reside in cities. But he also felt that the topic was “too complex, subtle and spiritual...to be checked off, item by item, like a jeweler’s or a florist’s wares.” In other words, it defied research and understanding.

Social scientists today would disagree with Olmsted. Hundreds of studies worldwide have established a relationship between trees, green spaces and myriad mental health benefits. In a 1963 essay, psychology professor Robert Greenway even coined the term ‘ecopsychology’ and in the Spring/Summer 2009 edition of *Taproot*, a publication of The Coalition for Education in the Outdoors, Denise Mitten succinctly listed the psychological-emotional values of spending time in nature (of which trees are a major component):

- Mental restoration
- Stress reduction and its impacts
- Attention restoration
- Improved mood states
- Reduction of depression
- Reduction of anger and anxiety
- Enhanced feelings of pleasure
- Increased mental acuity
- Reduced mental fatigue
- Improved problem solving-ability
- Improved concentration
- Improved body image for women
- Increased feelings of empowerment
- Encouragement of nurturing characteristics
- Decreased risk of seasonal affective disorder (SAD)
- Mitigation of the impact of dementia

To this list might be added important spiritual and religious benefits.



## THERAPY AND HEALING – SOME DIFFERENCES

**THERAPY** is the treatment of disease or disorders, as by some remedial, rehabilitating, or curative process.

**HORTICULTURAL THERAPY** is the engagement of a person in gardening and plant-based activities, facilitated by a trained therapist, to achieve specific therapeutic treatment goals.

**HEALING GARDEN** or **THERAPEUTIC GARDEN** is a space in which a person can build on or find inner strength. This is a space anyone can create or use and, by extension of the meaning, can include special places with trees. It is designed to meet the physical, psychological, social and spiritual needs of the people using the garden as well as their caregivers, family and friends. These spaces are typically found around hospitals, nursing homes, assisted living residences and retirement communities.

**HORTICULTURAL HEALING GARDEN** is a space professionals use to encourage active involvement of clients or patients. The therapist matches plants and chores with the needs of individuals that are challenged physically, emotionally or socially.

# Some Amazing Relationships

*Research is showing some strong correlations between trees and the green spaces around them and human health consequences.*

## HOSPITAL RECOVERY

Studies by Dr. Roger Ulrich gained world-wide attention and made a huge impact on the idea that the healing power of nature is real. Dr. Ulrich tracked the recovery rates of 46 hospital patients who had gall bladder operations. Half were assigned to recovery rooms facing a brick wall. The other half could see a small stand of trees outside their windows. He found that patients who could see trees spent 8.5 percent fewer post-operative days in the hospital and needed fewer pain-killing medicines than patients viewing the brick wall. The study has been replicated many places and with similar results.

## THE WORKPLACE

Stephen and Rachel Kaplan were also modern pioneers who looked at human-nature relationships, including office workers and their surroundings. As with many studies that have followed theirs, they found that workers with windows looking out at green elements were more satisfied at work and had more patience, less frustration, increased enthusiasm for work, and fewer health problems than their colleagues in windowless offices. Similar relationships have been shown to reduce absenteeism and increase efficiency.

## INNER CITY GIRLS

Work by Drs. Ming (Frances) Kuo and William Sullivan have uncovered a trove of amazing relationships. One famous study showed the positive social effects of landscape around public housing projects. Another focused on young girls living in Chicago apartments. They found that girls in apartments with greener, more natural views scored better on tests of self-discipline than a matched group of girls with more barren



views. The young ladies fortunate to have green views showed better concentration, less impulsive behavior and were better able to postpone immediate gratification. This means they can better handle things like peer pressure, sexual pressure and can generally do better in school and prepare more responsibly for later life.



# Some Amazing Relationships Continued

## CHILDREN



The Dimensions Educational Research Foundation is the repository for scores of studies that show the positive influence of unstructured outdoor play. Trees, of course, are a large part of the spaces that make this possible. The studies of these benefits point out that, in addition to physical benefits, outdoor play opportunities help make children “smarter, better able to get along with others, healthier and happier.” And then there are those who are challenged with Attention Deficit

Hyperactivity Disorder, or as it is often called in shorthand, ADHD. With over 2 million children in the U.S. diagnosed with ADHD, considerable attention has been focused on how natural settings might be of help. These studies have come to the same conclusion – children with ADHD show reduced symptom severity when they live in more natural settings or have “green time” during the day.

## PREGNANT WOMEN

One of the most amazing recent studies was led by Dr. Geof Donovan in Portland, Oregon. In short, the researchers found a strong relationship between leafy neighborhoods and the health of newborn babies. First they carefully controlled for factors such as income and then looked at tree canopy density within 164 feet of the homes of pregnant women. For each 10 percent increase in tree canopy in this zone around a house, the rate of undersized newborns decreased by 1.42 per 1,000 births.

## SENIOR CITIZENS

In a Dutch study that controlled for income and other factors, the proximity of nature was found to affect the health of the elderly. In a greener environment, people reported fewer poor health symptoms and perceived better health in general. The researchers concluded that “10% more green space in the living environment leads to a decrease in the number of symptoms that is comparable with a decrease in age by 5 years.”

## MORE STUDIES

[Links to more studies and to the authors of findings mentioned on these pages are provided at the website shown on page 8.](#)



# How Does it Work?

*The Druids and other ancients attributed the healing power of trees and other plants to magic. At first glance, one may conclude they were right. But now science is looking more closely not only at the relationship between nature and mental health, but the cause(s) behind the consequences.*

Some writers have argued that human affinity for trees – and resulting benefits – stems from our genetic base. That is, it is somehow linked to our primordial past. This is difficult to test and affirm or deny. The spiritual aspect of trees is equally murky. At this level of what might be called tree worship, the theory has been suggested that trees help us become more aware of our connection with something larger than ourselves. In her book, *Between Earth and Sky: Our Intimate Connections to Trees*, Dr. Nalini Nadkarni adds that trees put us in a state of “mindfulness,” or “the need to be aware of and compassionate towards one’s surroundings.”

For those who want more concrete evidence of the healing power of trees, there is a growing body of knowledge. Brain chemistry is certainly involved. Perhaps it is as simple as greenery stimulating a dopamine pulse, the neurotransmitter that sends signals to other nerve cells, including the so-called pleasure centers of the brain. But it is probably more than that. Research has focused on a number of physical effects of being around trees, gardens and other green or natural surroundings. For example, environmental psychologist Terry Hartig did an experiment using 112 young adults. They were assigned a variety of stressful tasks and then some were placed in a windowless room and some were exposed to tree views and walked through a nature preserve. He then measured blood pressure and found that the latter group showed blood pressure declining and better feelings commencing sooner than in the control group.

Japanese enjoying the ‘forest baths’ (walks in the woods) mentioned on page 1 were found to benefit from lower pulse rates, lower blood pressure and lower concentrations of cortisol, a chemical that, among other unhealthy things, suppresses the immune system.

## THE KEY

The bottom line that explains the healing power of trees points to stress reduction. Stress is our nervous system giving our body the so-called ‘fight-or-flight’ response to various stressors. While this was useful to cave dwellers – and still is in many circumstances – it is not so good as a reaction to the workplace, domestic situations, grief, brain fatigue and the other unavoidable circumstances of modern life. Stress triggers higher heart rates, muscle tension (and subsequent headaches), a weakened immune system, sweating and other unhealthy physical responses.

According to Dr. Marc Berman, as reported in *The Wall Street Journal*, trees and other components of nature engage our attention as something interesting and that do not require intense focus. They are something pleasant and give our minds and bodies time to restore themselves. In an experiment, Dr. Berman found that his subjects performed 20 percent better on memory and attention tests after they paused for a walk through an arboretum. Subjects that strolled down a busy street showed no cognitive boost on the tests.

## A SUMMARY OF BENEFITS

Dr. Kathleen Wolf sums up the benefits of exposure to nature in cities saying that the urban forest “can help us to calm and cope, to recharge our ability to carry on.” The healing – and preventative – effects of trees and green space on human health include:

- **PHYSICAL ACTION** or the eco-benefits that come from filtering air and water pollutants and reducing heat.
- **PHYSICAL ACTIVITY** by providing settings that encourage people to engage in walking, jogging and other outdoor exercises.
- **SOCIAL SUPPORT** by providing inviting places that promote social interaction, a sense of inclusion, and that can lead to reducing social annoyances and preventing crimes.
- **RESTORATION**, the result of reducing stress and helping people restore their cognitive functions and ability to cope with the demands of life.

*If a greener environment can play a role in managing ADHD (Attention Deficit Hyperactivity Disorder), few, if any, studies have explicitly examined whether the converse is also true: that ADHD may be a set of symptoms initiated or aggravated by lack of exposure to nature...*

*If that's the real ailment, a walk in the woods would be the ideal treatment: It's not stigmatizing, has no serious side effects, and it's free. But such reliance on greenery would underscore the need to scale back industrialism, redesign cities, and expand access to nature – which can't be encapsulated in a pill, but could be equally powerful medicine.*

– **Richard Louv**, Author of *Last Child in the Woods* and six other books, and quoted in the Attention Deficit website, ADDitude

# What it Can Mean to Urban Forestry

*The human health benefits resulting from trees and green spaces are significant. They have even been called the 'green vitamin,' or Vitamin G. And this powerful medicine rests in the hands of urban foresters, tree boards and other stewards of trees and green spaces in our cities and towns.*

## HOW TO USE THIS INFORMATION

- ✔ **PLANT TREES!** With 80 percent of our nation living in stressful urban situations, residents in all neighborhoods need the healing power of trees.
- ✔ **GAIN SUPPORT** The data developed by research can be a powerful tool in gaining the support for urban forestry by city councils, potential donors and grant organizations.
- ✔ **BROADEN YOUR AUDIENCE** Expand beyond traditional partners by showing health care providers and insurance companies the benefit of trees. For example, based on the Portland study of tree canopy density and healthy babies mentioned on page 4, the findings suggest that by increasing tree cover by 33 percent, there would be 3 fewer undersized newborns per 1,000 births. More trees would lower the costs of health care in this and many other ways.
- ✔ **CREATE HEALING GARDENS AND TREE GROVES** Spaces designed for this purpose will gain public attention and appreciation. Parks and other public land can be dedicated as healing spaces. Guidance for the creation and maintenance of these places can be provided to hospitals, care centers and similar institutions.
- ✔ **HAVE A MEMORIAL TREE PROGRAM** If your community does not have a way for residents to donate funds for a memorial tree, find out how these programs elsewhere provide a source of funding for trees while at the same time providing a humanitarian service.
- ✔ **SPONSOR A NATURE EXPLORE CLASSROOM** These carefully designed outdoor spaces not only connect children with nature, they can provide a place for family bonding. Domestic violence centers are among the many institutions using this means to provide solace to troubled children and parents.



Activities to initiate or expand the use of trees to take advantage of their healing power may qualify for points needed to earn the Tree City USA Growth Award. For more information, visit [arborday.org](http://arborday.org) and navigate to the Growth Award section.



istockphoto.com/simonax

## MEMORIAL TREES AND GROVES



The Grove of Remembrance is a program of the New Jersey Tree Foundation. The memorial grove is an 11-acre tract at Liberty State Park where 750 trees were planted in remembrance of the terrorist attack of September 11, 2001. Planning and development of the grove included involving the victims' families, an important element when considering a memorial grove. Besides the trees, features of The Grove of Remembrance include planting beds, donated shrubbery, and walkways that lead to a circular area with a plaque containing the names of all New Jersey residents who were lost on that fateful day.

Trees provide the psychological benefits described throughout this bulletin as well as eco-services such as cleaner, cooler air and stormwater retention. But they also offer one additional opportunity. When death occurs in a family or tragedy strikes on a larger scale, loved ones are often at a loss as to how to memorialize or properly celebrate the life of the deceased. Planting memorial trees can help – in two ways. First, it truly continues the contributions of an individual beyond his or her lifetime, and at the same time it provides an uplifting avenue of action for the bereaved.

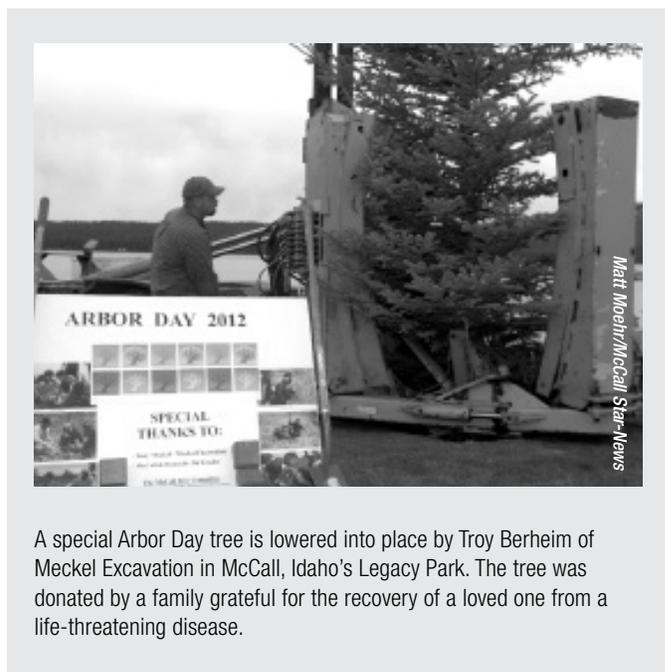
A community program that enables donations for memorial trees usually takes one of several forms:

- A special tree is planted somewhere in town or on an institution's grounds where it is needed, paid for with donations, and identified with a plaque or marker. The latter is sometimes flat on the ground or surrounded by mulch to address maintenance issues.
- Same as above but in a place designated for memorial trees such as along bike paths or in greenways, cemeteries, or arboreta.
- In both cases, the addition of individual trees is ongoing as the need arises and should be publicized with specific costs, rules and opportunities clearly spelled out in a brochure. Distribution of the brochure should include all funeral directors and churches in the area.
- A memorial grove might be created for the commemoration of a person or event. This usually entails the dedication of a piece of land for the purpose and the addition of infrastructure such as walks, lighting and appropriate signage.

## AN ADDED DIMENSION TO ARBOR DAY

Each year tree boards are faced with the question about where to plant trees and hold an Arbor Day celebration. When planning, consider using trees to meet the emotional/psychological needs of people in your community. Consider retirement homes or convalescent homes, hospitals, and similar spaces, or start a memorial grove where trees can be added in the future.

With a little thought, there may be other ways to get 'extra duty' from Arbor Day trees. Here is what the 2012 Arbor Day tree means to the residents of McCall, Idaho: A few years earlier a beautiful young spruce tree was spotted by resident Janet Meckel at a local tree farm. It was then marked with a ribbon as "Janet's Tree" and she planned to have it moved to her yard. But life for Janet took an unexpected turn and she found herself fighting for her life against acute myeloblastic leukemia. After a grueling bone marrow transplant and a long but successful struggle with the disease, Janet's family decided to have "Janet's Tree" donated to the city's park as part of the 2012 Arbor Day celebration. In a letter published in McCall's *Star-News*, Janet wrote that when she first saw the tree that she wanted for her yard, she saw it as "...as a beautiful and grand symbol of life and second chances. Now, where it stands in the middle of Legacy Park, our hearts celebrate knowing its branches will provide to everyone comfort in the heat and shelter in a storm, just as the arms of this community did for us. It is our prayer and desire that the tree will stand as a monument of gratitude and as a symbol of hope for generations to come."



A special Arbor Day tree is lowered into place by Troy Berheim of Meckel Excavation in McCall, Idaho's Legacy Park. The tree was donated by a family grateful for the recovery of a loved one from a life-threatening disease.

# Plant Trees in Celebration or Memory

The Arbor Day Foundation provides a way for individuals to recognize the important milestones in life and share the uplifting joy of trees with others.

**TREES IN CELEBRATION** Through this donor program trees are planted where needed in one of our nation's national forests. The donor or honoree receives a beautiful certificate that shows the species planted, the name of the national forest, and the number of trees planted. Trees in Celebration are especially appropriate for birthdays, employee recognition, anniversaries, new births, graduations and at other times where a gift is customary.

**TREES IN MEMORY** This program also helps plant trees where needed in our national forests and provides a means to express sympathy while at the same time providing benefits for future generations. The tribute is recognized with an attractive card telling the recipient what trees are being planted in honor of the deceased and in what national forest. The program is a way to inspire energy, faith, devotion and to memorialize the departed in a living, vital way that grows grander with the years.

'Trees for Pets' is a similar way to memorialize the loss of a faithful companion or to bring comfort to a friend or relative after the loss of a pet.

**GIFT TREES** Seedlings of a variety of species can be ordered for distribution at Arbor Day celebrations, weddings, graduations and other events. The seedlings come as rooted plugs in plastic, recyclable containers. An attractive, customized label can be included with a photo and/or wording of your choice.

For more information about any of these programs, please visit [arborday.org](http://arborday.org) and enter 'Trees in Celebration' in the search box.



## Tree City USA Bulletin ORDER FORM

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Other Bulletins that are particularly helpful when considering the healing power of trees or other benefits to the community through a planting program. For a complete list, visit [arborday.org](http://arborday.org)

	1 Issue \$3.00 ea.
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18. Tree City USA Growth Award	18.
19. How to Select and Plant a Tree	19.
22. Tree City USA: Foundation for Better Mgt.	22.
28. Placing a Value on Trees	28.
33. How to Interpret Trees	33.
34. How to Fund Community Forestry	34.
36. How to Work with Volunteers Effectively	36.
42. Working with Children	42.
43. Selling Tree Programs	43.
47. How to Bring Nature Explore to Community	47.
48. Teamwork Strengthens Community Forestry	48.
50. Tree Campus USA	50.
54. How to Grow a Great Tree Board	54.
57. Trees and Public Health	57.
58. Community Engagement	58.
61. Trees and Green Space Make Economic Sense	61.
64. Saving Our Heritage Trees	64.
65. Create an Arboretum	65.
69. Make Room for Trees	69.
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### FOR MORE INFORMATION...

For links to the hundreds of examples of the healing power of trees and related research, please visit [arborday.org/bulletins](http://arborday.org/bulletins) and click on Bulletin 71.