

Summer
 1999

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Stress on the Streets

(Trees Suffer from Road Rage, Too.)

Minnesota, like the rest of the United States, is becoming more urbanized. More than 75% of us live in urban areas.

The threat to rural forests that are being developed in third-, fourth- and fifth-ring subdivisions (peri-urban forests) is real and of concern. But the danger to these areas is geographically and resource limited. There are only so many forests and when those areas are developed, they're gone.

A growing concern that has no limits involves construction damage to publicly-owned, urban trees—those trees that were either survivors or were planted after development. These trees now line our streets, parking lots, schools, businesses and parks. In some communities, they may be 50 to 70 years old or more. And even though the development and construction of our communities may have taken place decades or a century ago, construction damage continues on a regular basis and with alarming frequency.

Street trees (boulevard trees, parkway trees, tree lawn trees) are most at risk. Streets and curbs don't last forever. They require periodic resurfacing, re-grading and re-engineering of curb shapes and heights. Sidewalks crack, heave and become dangerous for pedestrians. Many streets were designed and installed decades ago, long before they became popular as arterial streets. They have become too narrow for modern public safety vehicles or street

Stress on the Streets continued on p. 3



PHOTOS COURTESY GARY JOHNSON

"Hey, we didn't hit the tree." Street trees are frequently put at risk, though the results may not become evident for some time.



Each year, the equivalent of an entire township (36 square miles) of Minnesota land is converted from agricultural and forest uses into new construction and building sites. In addition to this significant loss of trees, thousands of other trees are affected by construction and related activities in areas already designated as urban.

Populations will continue to grow. New residential, commercial, industrial and institutional centers will continue to develop. Streets will be built, expanded and repaired, utilities replaced and parking lots extended— some even closely surrounding existing trees.

*Tree advocates will need to be more diligent and assertive than ever before to make sure trees are responsibly preserved through all the human-made changes in the years ahead. This **Advocate** focuses on some of the challenges faced by urban trees and those who use, manage and enjoy them. Read on, and consider what we all can do to help.*

The Minnesota Shade Tree Advisory Committee's mission is to advance Minnesota's commitment to the health, care and future of all community forests.

Ice Damage: Thoughts and Observations

I left for the trip home to Thief River Falls immediately after the MnSTAC meeting on Thursday, April 1. Between Mahnomen and St. Hwy. 2, I noticed ice starting to form on the tree branches and on grass alongside the road. The further north I drove, the more ice I saw.

The freezing rain continued all of Thursday night. Friday morning revealed moderate damage to trees, about a one-week clean-up effort for me, my seasonal employee and our chipper. But the freezing rain continued. Three inches of wet snow arrived Saturday night on top of the freezing rain. We awoke Easter Sunday to a wonderland of white and flattened shrubs, hedges and bent trees. As the sun melted the snow, everything sprung back upright. I think the springing action and whipping of the ice-laden branches is what caused them to break. Damage to trees was no longer moderate. It was severe.

Residents placed broken branches on the boulevard and at their regular garbage pickup sites for city crews to pick up. It took us six weeks to make three swings covering the entire city. We had one chipper with a three-man crew, two front-end loaders, two 10-yard dump trucks and one 18-yard garbage truck, each with a three-man crew, picking up the broken branches. The first two weeks my seasonal employee and I went with the bucket truck removing widow-makers hanging over streets and sidewalks. Approximately 2000 cubic yards of materials were picked up.

Green ash suffered the most damage, followed by poplar, boxelder and maples. Very few elms and oaks were damaged. A majority of branch failures were in the middle of the branch with a lengthwise split of the wood. There was minor damage to trees with poor branch unions or co-dominant stems and **NO** damage to trees that had been topped!

The fact that topped trees suffered no damage was very disconcerting. We've preached for years: Do not top trees because of the damage that could result from an event like this. It didn't happen. We haven't topped trees on public property for 20 years in our city. Most private property trees are not topped anymore either, but there are some out there. I believe the 3/4 inch coating of ice may have reinforced weak or poor attachments.

I will try to answer any questions on what I observed in this event. You may contact me at

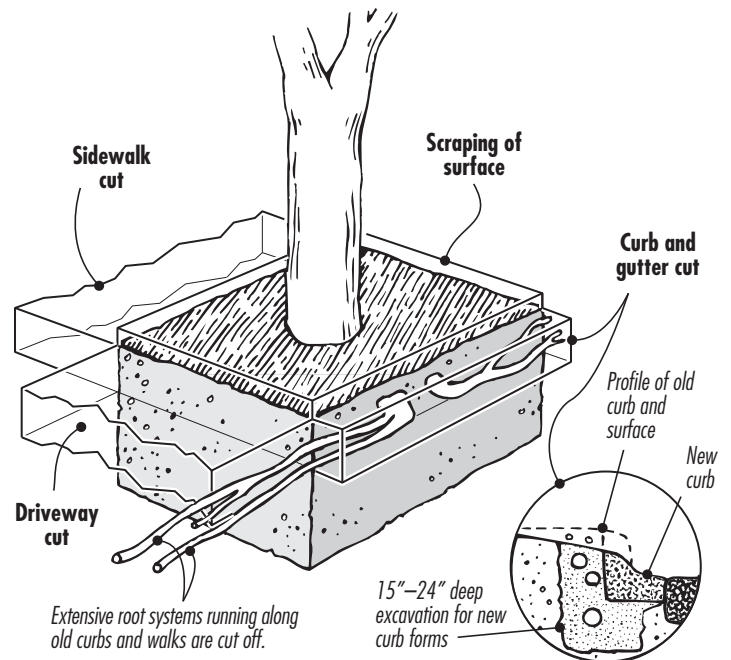
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Construction crews may not realize the effects of compaction, soil changes and root damage.



This tree suffered root damage on three sides . . . including topsoil scraping. The outlook is grim.



Shown here are the common ways in which four sides of root loss can occur. Any or all, or even a fifth cut, are possible. Many people don't realize how extensive damage can be from curb and gutter excavations.



Stress on the Streets, from p. 1

maintenance trucks, or are designated for parking on both sides.

Utilities fail or become outdated and must be replaced. New utilities or services are developed and installed below ground—fiber optics systems, landscape irrigation systems and invisible fences. In most boulevards, the top eight feet of soil is laced with an incredible network of buried utilities.

When streets, curbs, sidewalks, driveways and utilities are installed, improved or expanded, trees suffer construction damage. Most people don't recognize it, however, because the damage is usually underground. And most people don't realize how vulnerable street trees are to the stresses imposed on them from root loss or soil changes. Rarely are street trees badly wounded or scarred above ground during these activities, and rarely are street trees exceptionally healthy before the damage.

Boulevards were originally designed as tree lawns—literally, lawns for public trees to grow in. Except for water and sewer lines, driveways and sidewalks, there were no conflicts of use.

Stressed to begin with

Boulevards are far from ideal growing sites for trees. Soils range from rocky and sandy to hard-as-concrete clay, bone-dry to bog-soggy. Occasionally you may find beautiful sandy loam soil in a boulevard, especially in some of the older neighborhoods and towns. (Occasionally you may find a \$20 bill lying on the ground, too!) Soil pH is variable. In some of our boulevard research areas, the soil is close to the native soil pH range, 5.5-6.5. A few blocks away, it may reach 8.5 or higher! Unfortunately, the majority of trees planted in boulevards perform best in soils that are well-drained, organic and with a pH range of 6.0-7.0.

Under normal circumstances, tree roots spread in an area two to four times their height. However, if a curb is three feet away from a tree trunk, that is effectively the spread of the roots on that side. Major roots have a tendency to grow to the curb, turn and then run linear with it.

Some roots grow under curbs, streets, sidewalks and driveways, but it's unpredictable. The windthrows from the storms of 1997-98 illustrated this perfectly and made us wonder how some of those towering trees stayed vertical for as long as they did.

Street tree roots don't penetrate very deeply, rarely more than three feet. In some areas with compacted clay, the majority of the roots are in the top 18 inches of the soil profile. Now, add deicing salts, turf competition, pesticides and animal waste to the soil matrix, acts of unintentional "vandalism" to the trees (stapling trunks, breaking branches, lawn mower wounds and tree topping), and you'll develop a renewed respect for any tree that even survives these conditions, much less thrives in them.

What they can tolerate, what they can't

Although "construction damage" is an ambiguous term, most of the damage to boulevard trees involves root loss. Trenching, excavating and regrading the surfaces of the tree lawns removes tremendously high percentages of supportive branch roots and conductive (water and nutrients) finer roots. A relatively healthy boulevard tree can usually tolerate one-sided root loss from trenching or excavation. It will definitely be less stable and more vulnerable to drought, insect and disease stresses for a few years, but it can recover if given adequate care.

Trees that suffer two-sided root loss are unstable and less likely to recover. Unhealthy

Stress on the Streets continued on p. 12

Most of the damage to boulevard trees involves root loss.

"Well, we had to rest those stone pallets somewhere." Soil compaction is an unseen, and potentially mortal, enemy of trees.



Stress and Secondary Invaders

By Marc Shippee and Patrick Weicherding

Concrete cleanup (right) and root damage (below) are two common ways that the spiral to loss of vitality begins.



Predisposing conditions, or primary stresses, have the greatest long-term effect on tree and forest health.

Damage to trees doesn't usually stop when the bulldozers and moving vans drive off into the sunset. Trees and forests that have suffered the assaults and insults of urbanization do not normally die all of a sudden. They are more likely to enter a decline spiral leading to death that could take several years. And often, their decline in health and eventual death is blamed on diseases and/or insects that have become obvious during the later stages of the decline.

This decline spiral is speculated to have three distinct components and phases: **predisposing conditions**, **inciting events** and **contributing agents**. Many of the damages incurred during construction and development of a site result in **predisposing** conditions—those conditions that impact the health of the tree or the forest for the rest of their lives. These are often referred to as primary stresses because they occur early in the spiral and have the greatest long-term effect on tree and forest health. Although it's not always obvious, trees and forests that have been subjected to predisposing conditions are much less healthy than other trees and much more vulnerable to other, secondary problems.

Inciting events are those that impact health, but only for a short peri-

od of time. Although these events tend to have a dramatic effect on the tree or forest, healthy trees and forests (those with few or no predisposing conditions) tend to recover and grow well. As opposed to predisposing conditions, inciting events are largely impossible to predict and prevent.

At some point the tree or forest loses most of its vitality (health) and the **contributing** agents set in. These agents are usually secondary problems and seldom cause significant damage to a healthy tree or forest. Unfortunately, contributing agents such as diseases and insect pests are more obvious than predisposing conditions and are usually blamed for the death of the tree or forest.

Treating the Problem, Not the Symptom

Since contributing agents are the most obvious assaults on tree and forest health, most attention is given to controlling them. In reality, they are only opportunistic and only cause problems on those trees or forests that are already stressed and dying. To most effectively stop the decline spiral, "control tactics" need to target those early, predisposing conditions. The most effective and efficient tactic to control predisposing conditions is prevention.

Common Predisposing Conditions

■ **Permanent Root Loss.** Roots lost to trenching operations fall into the inciting events category, since a healthy root system can eventually regenerate a new one. But if roots are removed and the regeneration of a new, complete root system is prevented, this becomes a predisposing condition.

■ **Soil Alterations.** Soils that have become compacted, especially clay soils, inhibit water and oxygen infiltration, root penetration and the re-establishment of a healthy root system. If development and construction activities have resulted in compacted and poorly drained soil, the situation worsens and undamaged roots begin dying and declining.

It's easy to overlook the stress that mower and trimmer damage can cause.



■ **Stripping Off**

Topsoil.

This effectively throttles the normal nutrient cycling and recycling processes of a forest or tree system that relies on those decaying leaves and branches or the organic material in topsoil. Top-dressing the site after construction with an inch or two of black soil and fertilizing the trees is a short-term and token effort. And if the natural soil pH has been drastically altered due to topsoil loss, cleaning out of concrete trucks and other containers, or the burial of alkaline (concrete, plastic) materials, characteristic root systems are not likely to ever reestablish.

■ **Climatic Changes.** Climate is the most subtle of predisposing conditions. As the soil and/or forest floor becomes more exposed to drying sun and winds, moisture levels and soil temperatures fluctuate wildly, making it very difficult for the native soil microorganisms to survive. As with all parts of a system, the health of the tree and the forest is dependent upon the health of the living and decaying organisms in the soil.

■ **Introduced Competition.** In a natural condition, trees live in a relatively non-competitive environment, particularly for water and nutrients. When soils are stripped of their organic layers including the decaying leaves and branches, and super-competitors like turfgrasses are introduced, struggling trees and roots are put at an even greater disadvantage for space, nutri-



Deicing spray drift often results in witches' brooming (above).



ents and water.

■ **Wounding and Chemical**

Contaminants. Although these two factors are often considered inciting agents, they may also act as predisposing conditions. Severe trunk wounds can lead to extensive decay and compromise both the general health and the stability of a tree. Chemical contaminants that result in high soil soluble salt indexes (e.g., deicing salts in the soil) or permanently altered soil chemistry have long-term effects on tree and forest health.

Common Inciting Events

- **Seasonal drought**
- **Defoliation** by insects or diseases
- **Hail storms**
- **Wind storm damage**
- **Deicing salt spray drift**
- **Herbicide drift**

Common Contributing Agents

■ **Pathogens** (disease-causing agents):

—Armillaria and other root rots that infect older, stressed trees, especially in compacted and/or poorly drained soils.

—Nectria and other cankers that infect wounded and stressed trees.



Insects, such as this two-lined chestnut borer, are secondary problems—more obvious to the eye than the underlying problems that robbed the tree of vitality.



Healthy trees can normally handle subsequent short-term inciting conditions; weakened trees can have trouble.



Secondary Invaders continued on p. 6



Typical damage from the bronze birch borer.



Secondary Invaders, from p. 5

—Ganoderma and other root and butt rots that infect wounded and stressed trees.

■ Insect Pests

—Flat-headed borers, such as the two-lined chestnut borer that infests oaks and

hornbeam and bronze birch borers that infest American hornbeams and birches that are stressed from drought and/or competition. The flat-headed apple borer may become problematic on stressed maples, oaks and willows.

—Round-headed borers that infest many stressed hardwoods.

Lilac/ash borers infest most ashes. Red-headed ash borers have a wide host range including ashes, oaks, walnuts, birches, maples, basswood and elms. Linden borers infest lindens (basswood). The round-headed apple borer infests all stressed trees in the Rose family, which includes crabapples, serviceberries, hawthorns and mountain ash.

—Bark and ambrosia beetles are particularly damaging to stressed pines and spruces, but also have a wide host range of hardwoods.

After vitality is gone, the contributing agents move in . . . and get the blame.



Fungal infections such as *Armillaria* (right) and *Laetiporus* (above) take advantage of weakened trees.



■ **Related Problems.** Not all of the problems associated with declining and dying trees fit nicely into the contributing agents' category, but they are associated with trees and forests that have been stressed by the activities of urbanization. Overland transmission of *oak wilt* has been linked to wounding of oaks during construction and development during oak wilt's high risk season (April, May and June). Research conducted at the University of Minnesota revealed that oaks in areas of construction activities are four times more likely to become infected with the oak wilt fungus.

Oak, ash and maple decline are complexes that involve several predisposing and contributing factors, many of which are associated with the effects of urbanization: wounding, changing soil pH, changing microclimates, deicing salt spray drift and soil compaction. These three genera of trees are the dominant trees in the southern half of Minnesota, both in rural and urban forests.

There are no easy and completely reliable treatments for recovering stressed and declining trees, and certainly treating symptoms with pesticides and fertilizers cannot be considered effective "controls." The obvious solution is prevention of the stresses imposed on the trees and forests by the early, predisposing conditions brought on by development and construction activities. Avoid changes to the soil and climate, protect trees and forests from wounding and root loss, and never let the trees become drought stressed. 🌿

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Pre- and Post-Construction Pruning

by Jeff Rick

Urban sprawl continues, and home additions become more enticing as housing prices continue to climb. Human habitat improvements have the potential of settling a palace into a wood lot, or of creating a slow and unintentional clear cut.

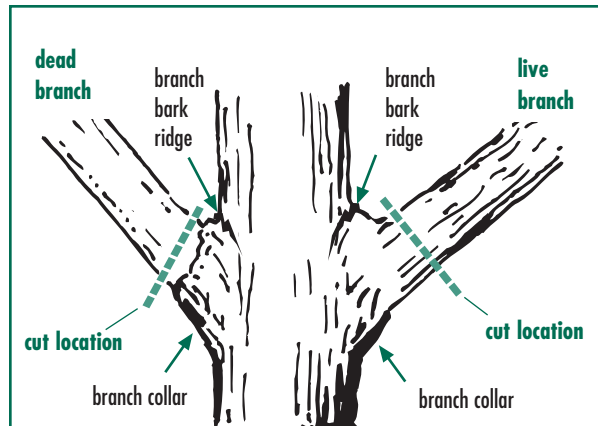
Long term tree survival is mostly determined by activity on the ground, related to care and protection of the root zone. No pruning, whether before or after construction, can improve tree health.

Root-to-shoot balance will occur over time without our intervention. Too bad we are not able to predict which branches will die back. When roots are damaged, the root system is unable to provide water and nutrients to the crown in the manner in which it is accustomed. This causes a reduction in photosynthesis, or manufacture of energy, and the crown dies back as the tree depletes carbohydrate reserves. Please see the article, "Dispel a Myth: Compensatory Pruning" by Rich Hauer, *Shade Tree Advocate*, Vol. 2, No. 2, page 5.

Pruning may be required at the time of construction, but for different reasons.

The focus of pruning, whether before or after construction, needs to be on dead and structurally weak branches. A tree must be inspected for potential hazards: large dead wood, cracked branches, weak branch and stem unions (sharp-angled attachments and/or included bark) and signs of interior defects (fungi fruiting structures, bulges and cavities).

Water spouts do provide benefit for the tree, and may be selectively thinned out over a 3-5 year period. Future structural concerns



Where to prune a branch.

Pruning exercises a greater influence over tree structure, while root protection and treatment exercise a greater influence over tree health.

may be avoided by selecting water spouts to save and eliminating those that are attached with a sharp angle to the trunk.

Removal of leaf area on any tree will cause a reduction in manufacture of carbohydrates. This is the same energy required to generate new roots. For this reason, removing leaf area after root loss can actually slow down the recovery process rather than equalizing it.

Pruning of live wood, whether before or after construction, can do relatively little to improve tree health. ✨

Jeff Rick is an ISA Certified Arborist and a Consulting Arborist with Rainbow Treecare in St. Louis Park. He is also a member of MnSTAC's Education and Research committee.



Strong (left) and weak (right) branch unions.

Clip and Save



Pre- and Post-Construction Pruning

It's More Than Wrapping Snow Fence Around Tree Trunks

The roads are going in, the homes soon to follow. But already we see that many trees won't be there for the housewarming party.



Accepting 30-50% forest loss during development ignores the biological principle that the system has been disrupted and will falter.

Right: One example of a tree that was "saved."



Trees and forests are biological systems—systems that operate beautifully and for a long time when all their parts are present and working. Take away one part and the system skips a beat, maybe faltering just slightly. Remove another part or two and the system falters more noticeably.

With continued faltering, remaining parts begin to suffer as the burden of the whole weighs heavier on them. In time this once-healthy system becomes vulnerable. What may once have been relatively tolerable stresses might now mean a forest at risk. One summer of drought, one defoliation by insects or diseases or one unusually generous winter serving of deicing salt can mean disaster.

Some parts of a forest's system are obvious—vegetation that includes trees, shrubs and ground-covers. Just as important are the less obvious parts—soil, water, soil microorganisms, ambient temperatures and humidity. Success or failure of the system depends on the health of the sum of all the parts.

Individual trees are systems, too. The major parts – canopies, stems and roots – are in turn linked to soil, water, air and soil microorganism quality. Damage to one part of a tree's system affects everything else. If a significant amount of the root system is lost or damaged during construction, the whole system is affected and sometimes fails.

As root systems decline, photosynthesis is reduced as well as water and nutrient transport to the stem, branches and leaves. Branches "shut down" and fail (die). Energy reserves that contain (compartmentalize) the decaying, dead branches are not as plentiful and the containment weakens as decay becomes more aggressive.

A summer-long drought comes along. The tree becomes more stressed; opportunistic insects like borers move in and finish it off. And it probably all started with someone thinking, "What's the worst that could happen if I cut off these roots?"

Construction damage at the landscape level is insidious, and the cause and effect relationship often escapes even the trained eye. Relatively small pockets cut into a forest for a homesite seem almost inconsequential. But then roads and driveways are cut for access to the site, and utilities are trenched in for 20th Century conveniences. It's likely that more than one building pad will be cut in so several sites can be served by the roads and utility trenches.



Wherever two or more people settle, it seems a convenience store soon follows. Gas pumps, liquor stores and pizza parlors spring up. As the area develops, it attracts more commuters seeking the solitude and freedom of living in the country. Roads are expanded and improved to accommodate the increased traffic, and *voila!*—urban sprawl inches forward once more.

What's happening to the forest system? The formerly solid, continuous forest is becoming "fragmented," – cut up into smaller, separate or loosely connected units. Even if individual trees are labeled "significant" and carefully protected, more edges of the forest are exposed to drying sun and wind, more chainsaws collect dead (or live) wood for the fireplace and deicing salts drift off those new and improved roads.

Forest edges get "tidied up," ridding the visual park of unsightly leaf and branch litter. Lawns are established, and petrochemical products (pesticides, fertilizers) are used to support the newly planted and the declining remnant forest trees. "New and improved, fast-growing" plants like tall-hedge buckthorn, honeysuckle and Amur maple are planted. The biological character of the original forest slowly changes to the character of the 20th Century residential landscape.

Urbanization is characteristically a slow, deliberate degradation of the natural system. Soil temperatures and moisture contents fluctuate more than before. Soil chemistry (usually pH) becomes altered, and native soil microorganisms shift in character. Individual trees along the new edges begin failing; other interior trees become the new edge trees. Natural, forward, forest succession (the natural replacement of one group of plants by another) often screeches to a halt.

The character of Minnesota is changing, courtesy of urbanization, development and construction damage to forest and tree systems. In our lifetime, we'll never see century-old oak savannas, sugar maple and basswood forests or red oak and hornbeam forests regenerate if they are chopped up for subdivisions. And our grandchildren will never see them either if the forest floor is stripped, compacted, sodded and paved.

Now is the moment to intervene. Act to protect connected forest systems from urbanization. Encourage your community and developers to subdivide in open spaces or at the edge of forests, rather than within them. Cluster new homes, rather than spreading them out. Build up rather than out. Reconnect fragmented forests such as the Greening the Great River Project is attempting to do. Contact Jean Moulle at Metro DNR Forestry and get information on the drafted "*Conserving Wooded Areas in Developing Communities: Best Management Practices in Minnesota.*" (See page 10.) Check out the urban sprawl website at www.webcom.com/~pcj/sprawl/spr-cont.html

Protecting individual trees during construction is good. But accepting 30-50% forest loss during development ignores the biological principle that the system has been disrupted and will falter. Believing that protecting half of the forest system will ensure a healthy remnant forest is about as (bio)logical as believing that wrapping snow fence around a tree trunk will protect it from construction damage. 🌿



"What's the worst that could happen if I cut off these roots?"



This exclusive development planned to have the best of both worlds. But none of the trees you see here survived.



The character of Minnesota is changing, courtesy of urbanization, development and construction damage to forest and tree systems.

Letters to the *Advocate*

We welcome reader comments and ideas, and share this response to the article "Planning for Replanting, Winter 1999 Volume 2, No. 1 issue.

I was pleased to see an article in the *Advocate*, Winter 1999 issue about replanting our urban streets. However, it was disappointing that no design issues were addressed. The loss of many trees, as was the case in the Twin Cities with the Dutch Elm Disease, gave us a great opportunity to use trees not only to shade our community, but to become a major design parameter to delineate business and shopping areas, one neighborhood from another, neighborhood vs. commercial, major thoroughfares from side streets, etc. In the Twin Cities we unfortunately missed this opportunity, but we have a chance to tell others—St. Peter and Comfrey come to mind—to do a better job.

Further, your article mentions existing soil conditions several times. Most soils in our cities are "urban" as a mix of top soil, subsoil and urban grime. Soil testing is necessary, but our best bet is to use trees that withstand urban conditions including native and non-native species.

Finally, there is an opportunity to break away from the 40 feet on center mentality and to try some more naturalistic plant groupings, double row plantings, etc.

Again, it's good to see the articles, but let's expand our thinking to use trees to delineate our urban areas.

Peter Olin
Director, Minnesota Landscape Arboretum, Chanhassen.

Editor's Note: *The topic of design merits its own feature article, and more about soils would be valuable too. We have added the suggestions to our "upcoming issues" list.*

Thanks!

"Conserving Wooded Areas in Developing Communities"

A New Resource to Help You

Have you been concerned—maybe even alarmed—about the destruction of trees due to construction and urban sprawl in your own community? Have you wanted to be more active in preserving trees, but felt unsure just what to do? You are not alone, and a new resource to help tree advocates, decision makers, landowners, developers and citizens will be available this fall.

There is a growing awareness and concern among decision makers, natural resource managers, landowners and citizens that the urban biosphere is at risk under current land development practices (urban sprawl). Destruction and fragmentation of wooded areas and farmlands, loss of individual trees and loss of wildlife habitat threaten the ecological integrity and functions of natural systems as well as the quality of life in urbanizing areas.

An advisory committee, composed of a wide representation of builders, planners, landowners, agriculturists, parks and recreation groups, city and county foresters, state agencies, utilities, the University of Minnesota and tree and forest industry professionals, is in final stages of completing a guidebook of best management practices for conserving wooded areas in developing areas. Funded by the Minnesota Legislature, the guidebook will be available through the Minnesota Department of Natural Resources, Division of Forestry.

Although committee members were coming from many different perspectives and did not always see issues the same way, the group started by establishing common ground everyone could agree on: the benefits of wooded areas and individual trees. They proceeded with extensive research and discussion, leading to development of specific strategies for tree preservation in a variety of settings. Each of the five sections of the guidebook includes a wealth of information for anyone who wishes to minimize impacts of construction on wooded areas and trees.

- Section 1: Economic, social and environmental benefits of wooded areas and trees in urban areas.
- Section 2: Land-use approaches to promote conservation of ecosystem integrity and functions of wooded areas throughout the landscape.
- Section 3: Overview and new context-sensitive design for transportation systems and utility infrastructure.
- Sections 4 and 5: Step-by-step, site specific land development approaches and site options to minimize disturbance and construction damage to trees during development at subdivision and lot levels.
- The appendices that follow offer dozens of resources and references, including contact information for federal and state agencies, organizations, programs and projects that can offer in-depth information on specific management practices.

Key components of the best management practices include defining goals, inventorying and assessing resources, creating a conservation or protection plan, identifying and selecting land protection outcomes and evaluating/monitoring.

The title of this resource guide is ***Conserving Wooded Areas in Developing Communities: Best Management Practices in Minnesota***. Selected BMPs from the guide will appear in the *Advocate* in the months ahead. In the meantime, for more information call Jean Mouelle, DNR-Forestry, at 651/772-7567.

MnSTAC 1998 Awards

This year's MnSTAC Awards Luncheon was held April 1, 1999 at Bunker Hills in Blaine, Minnesota. The event celebrated the successful efforts of youth, volunteers and businesses in community forestry projects and programs. Although the number of award nominations was not high, those received reflected high quality, excellent planning and caring for urban and community trees.

The MnSTAC Awards are an opportunity to recognize and acknowledge the efforts of individuals, organizations, corporations and governmental units as part of the collective vision for the future of Minnesota's community forests. A special thanks to the MnSTAC Awards committee whose time and have been greatly valued: Teri Goodfellow Heyer, Al Olson, Donna Bell, Dave Sundmark and Ken Holman.

This year's award winners are:

Outstanding Youth Project Award

Students of Gleason Lake Elementary School, Wayzata

For: Their efforts to plan, plant and maintain the Gleason Lake Outdoor Learning Center.

Outstanding Arbor Day Award/Arbor Month Celebration

Gleason Lake Parent Teacher Association and the City of Plymouth—Division of Forestry

For: Their exemplary support of the 1998 Arbor Day celebration at Gleason Lake Outdoor Learning Center.

Outstanding Partnership Award

Mineland Reclamation Division—Iron Range Resources and Rehabilitation Board

For: The high level of cooperative spirit and effort demonstrated through their 1998 Arbor Day Environmental Fair.

Outstanding Community Forestry

Minneapolis Park and Recreation Board—Division of Forestry and the Minneapolis Department of Public Works

For: The exemplary cooperative agreement to share resources in the 1998 storms and ongoing emergency response.

Distinguished Service Award

Dorothy Johnson

For: Outstanding contributions to urban and community forestry on behalf of the Minnesota Shade Tree Advisory Committee 1998.

Achievement Certificates

The City of Coon Rapids

For: Their commitment to education and promotion of Arbor Day.

Impressions, Incorporated, St. Paul

For: Their landscape planning efforts, which serve as an innovative model for business.



“In the woods, we return to reason and faith.”

Ralph Waldo Emerson said it; tree advocates everywhere experience it. A walk in the woods can bring a sense of peace, connectedness and joy that is rare in today's fast-paced world.

Minnesotans are lucky; 57 forest campgrounds around the state make the woods available within a reasonable distance to all state citizens. Have you enjoyed one of them recently? Do you promote them and their natural wonders to others? Did you know a few of them even have small rustic cabins available for rent?

For a great brochure about Minnesota's forest campgrounds, call 651/296-6157 or toll-free 1-800/766-6000.





Soil compaction from trucks and other vehicles is often worse than bulldozer compaction, especially when the soil is a wet clay.



Keeping trees well-watered at all times is the single most effective treatment for helping them recover from damage.

trees are more likely to die from two-sided root loss. Even healthy trees are likely to suffer some branch death and require dead-wood removal pruning two to four years after construction. Depending on the tree species, age and relative health, however, many of these trees can recover if they receive immediate and proper care after the construction.

Trees that suffer three-, four- and five-sided root loss (five-sided root loss includes four sides cut vertically and the top regraded) make good firewood or woodchips, depending on the age of the tree. It's probably not wise to save these trees if the root loss is unavoidable. Remove them, and replace them after the construction project is completed.

Other variables

■ The **width of the boulevard** plays an important role in the survival and health of the trees after construction, provided that the trees are centered between the curb and sidewalk. Trees growing in boulevards 10 feet or wider have a much better chance of tolerating the root losses compared to trees growing in three- to five-foot wide lawns. There's simply more room for a higher percentage of the trees' root systems to grow in and avoid damage.

■ **Age or size of the tree.** Younger or smaller trees recover faster from root loss than older and bigger trees. There are less wood and leaf surface areas for their roots to supply water and nutrients to, and there are more actively growing tissues in a younger tree.

■ **Relatively healthy trees survive root loss better** than highly stressed trees. Severely stressed trees are living on the edge, so to speak. The added stress of root loss, soil compaction or pH changes can effectively push them over the edge.

■ **Tree species vary in their tolerance** to root and soil changes. Some species—silver maple, hackberry, green ash and bur oak—are more tolerant of root loss and soil changes. Other more sensitive species—ironwood, white oak, black walnut and blue beech—quake and shake at the sight of a bulldozer.

Some logical steps to reduce the damage and loss

1. **Seek variances.** Not all streets need to be widened. If your community values the boulevard trees more than acres of concrete, let your city know. You pay the bills and they work for you. Create reasonable compromises that protect the best trees by avoiding root loss. Keep streets the same width. Allow curves in the street to avoid damaging trees. Compromise by restricting parking to one side or no sides of the street rather than both sides. This will negate the necessity for landing-strip street widths.
2. **Combine utility trenches whenever possible.** Not every utility needs its own separate trench. Simply combining just two utilities to a common trench eliminates one trench, and may reduce the damage from two-sided to one-sided.
3. **Save the best; chip the rest.** Don't save trees that are unhealthy, too tall for the root space they'll be confined to, hazardous or of a very sensitive species – if the damage is unavoidable.
4. **Insist that foresters and arborists make the evaluations and decisions regarding trees.** These significant investments deserve the attention of knowledgeable professionals.

5. **Do not allow construction activities on boulevards that compact or pollute the soil.** Allow no parking of vehicles or equipment, no storage of construction materials or excess soil, no cleaning of concrete truck chutes or equipment.
6. Whenever possible, **insist that tunnels be drilled** under the roots for utilities near trees rather than trenches being dug through the root systems.
7. If new curbs will replace old ones, **hand-form the curbs near the roots**, using forms that “slip” in between the existing curb and roots. Avoid curb excavation that cuts roots.
8. **Assume some ownership and responsibility** for the health of the trees. Don’t let them become stressed before, during and after the construction process. Keeping the trees well-watered at all times before, during and after construction is the single most effective treatment you can do to help them recover from damage.
9. **Nurture the trees’ remaining roots forever.** Think beyond the box! Boulevards don’t absolutely need to be covered with mown turf. Mulch the root systems with wood chips.
10. **Plant a “blooming boulevard”** in the mulched area with perennials, shrubs and/or ornamental grasses, but not—for maintenance efficiency—annual flowers like petunias.
11. **Replant with logic.** If the remaining boulevard is only three feet wide, don’t replant with a tree, especially a big tree. Consider creating “green easements” within your community - replanting the trees on the property owner’s side of the sidewalk. Select trees that are adapted to the unique soil and space characteristics of your boulevard. For information on trees adapted to specific sites, refer to these publications:

“The Right Tree” brochure, available from Minnesota Power Association at 1-800-228-4966 or the University of Minnesota Extension Service Distribution Center at 612/625-8173.

Also available from the Distribution Center are these University of Minnesota Extension Service Publications:

—*Recommended Trees for Southeastern Minnesota*

—*Recommended Trees for Southwestern Minnesota*

—*Recommended Trees for Tallgrass Prairie*

—*Recommended Trees for North Central Minnesota*

These steps will initially cost the residents of a community more than carte blanche removal of trees and roots, and uninterrupted trenching. But long-term costs will be reduced through fewer tree replacements, increased property values and less damage to the gray infrastructure (sidewalks, curbs, streets). It’s worth the investment. 🌱



Root damage and soil pollution—a deadly prescription if not remedied.



Depending on the tree species, age and relative health, many trees can recover if they receive immediate and proper care after the construction.

About MnSTAC

The Minnesota Shade Tree Advisory Committee (MnSTAC) was established in 1974 by a group of concerned citizens to address the health and well being of community forests. MnSTAC provides a forum where people forge a collective vision for the future of Minnesota's community forests and:

- advocates for public and private community forestry interests
- unites for the exchange and dissemination of ideas and information
- serves as the State Urban Forest Council to advise the State Forester on the implementation of state and federally-funded programs.

MnSTAC is recognized throughout Minnesota and the country for its expertise, advice, coordination and support for community trees. It is an organization of diverse individuals who represent a broad spectrum of tree-related interests. It fosters and supports local community tree programs across the state so healthy community forests are fully integrated into community development, infrastructure, education and management.

The MnSTAC resources listed here encourage your calls, questions and sharing of ideas.

MnSTAC BOARD OF DIRECTORS

President: Glen Shirley, City of Bloomington
—612/948-8760 (Fax: 612/948-8770)

Vice President: Kirk Brown, Twin Cities Tree Trust—612/920-3239

Dan Gullickson, MN Dept. of Transportation
—651/779-5084

Katie Himanga, Heartwood Forestry
—651/345-4976

Ken Holman, DNR Forestry
—651/772-7565

Gary Johnson, U of M Forest Resources
—612/625-3765

Mike Max, EnvironMentor Systems, Inc.
—612/753-5505

Dwight Robinson, MN Dept. of Agriculture
—651/296-8578

Mark Stennes, Top Notch Treecare
—612/922-3239

MnSTAC COMMITTEES AND TASK FORCES

Arbor Month Partnership

Chair: Don Mueller, DNR Forestry
—651/772-6148

Constitution and Election

Chair: Ken Simons, Ramsey County Parks
—651/748-2500

Education and Research

Chair: Gary Johnson, U of M Forest Resources—612/625-3765

Forest Health

Chair: Steve Kunde, Kunde Company
—651/484-0114

Legislative

Chair: Mark Schnobrich, City of Hutchinson
—320/234-4459

Outreach

Co-Chairs:
Peter Bedker, Treescapes
—612/682-9562
Mike Max, EnvironMentor Systems, Inc.
—612/753-5505

Planning

Chair: Dave DeVoto, Stacy, MN
—612/462-3347

Publicity and Awards

Chair: Terri Goodfellow-Heyer, MN State Horticultural Society—651/643-3601

Scholarship

Chair: Ralph Sievert, Mpls. Park and Rec. Board—612/370-4900

Tree Emergency Response

Chair: Katie Himanga, Heartwood Forestry
—651/345-4976

Tree Preservation Task Force

Chair: Paul Buck, City of Plymouth
—612/509-5944

Wood Utilization Task Force

Co-Chairs:
Mike Zins, U of M Arboretum
—612/443-2460 Ext. 247
Jim Hermann, Mpls. Park and Rec. Board
—612/370-4900

Regional Committees

These regional MnSTAC committees are in place to add more voices to the forum and encourage networking more easily at the local level.

Southeast STAC

Southeast STAC represents communities in the eleven counties of the Hiawatha Valley Resource Conservation and Development Area.

Chair: Henry Sorensen

Asst. Pub. Service Director, City of Red Wing 651/385-3674

Sec./Treas.: Katie Himanga

Heartwood Forestry, Lake City 651/345-4976

Headwaters-Agassiz STAC

HASTAC, the Headwaters-Agassiz Shade Tree Advisory Committee, is northwestern Minnesota's branch of MnSTAC. The NW Regional Development Commission is the fiscal agent.

Chair: John Johnson

City Forester, City of Thief River Falls 218/681-1835

Sec./Treas.: Jeff Edmonds

DNR Forestry, Bemidji 218/755-2891

West Central STAC

West Central STAC started in 1997 to help communities in the northwest region share ideas, information and local success stories in managing community trees.

Chair: Bob Fogel

Director of Parks, City of Moorhead 218/299-5340

Sec./Treas.: Dave Johnson

DNR Forestry, Detroit Lakes 218/847-1596

NEW! NE MnSTAC Comes Into Being

Northeast Minnesota STAC is "official" as of May 1999. This Arrowhead region committee has launched an enthusiastic agenda for reaching the citizens of this area on issues regarding community trees, and will hold a landowner/urban tree enthusiast workshop at the Cloquet Forestry Center this fall. NE MnSTAC has hired a part-time coordinator: Kathleen Preece, publisher of *Minnesota BetterFORESTS* magazine.

Chair: Kelly Fleissner

City Forester, City of Grand Rapids

Treasurer/Technical Advisor: Dan Jordan

IRRR—Mineland Reclamation

Coordinator: Kathleen Preece

Minnesota BetterFORESTS magazine

218/326-0403

e-mail kathleen@uslink.net.



Events and Conferences

July 22-23—**Vegetation Management on Difficult and Changing Sites**, Duluth, MN. Contact Vegetation Management Association of MN, 7100 Utica Lane, Chanhassen, MN 55317.

Aug 1-4—**International Society of Arboriculture 75th Annual Conference and Trade Show**, Stamford, CT. Contact ISA 217/355-9411.

Aug 5-6—**Minnesota Nursery and Landscape Assoc. Summer Meeting and Trade Show**, Bailey Nurseries. Contact MNLA 651/633-4987 or www.mnlandscape.org

Aug 5-8—**Midwest Environmental Education Conference**, Stillwater, MN. Contact 612/854-5900 or www.seek.state.mn.us/calendar.cfm

Aug 25-28—**Shade Tree Wilt Disease: A National Conference**, St. Paul. Contact

www.scisoc.org/opae/shortcourse/

Aug 31-Sep 5—**9th National Urban Forestry Conference**, Seattle, WA. Info at www.amfor.org

Sept 27-29—**Trees, People and the Law National Conference**. Contact NADF 402/474-5655.

Dec 8-10—**Turf and Grounds Conference**, Mpls. Contact 612/625-9234.

Jan 5-7—**MNLA Convention and Trade Show**, Mpls. Contact MNLA 651/633-4987 or www.mnlandscape.org

Feb 1-3—**Trees and Utilities National Conference**, Nebraska City, NE. Contact NADF 402/474-5655.

Opportunities

Global ReLeaf Forest Ecosystem Restoration Program—American Forests is accepting proposals for three planting projects that may qualify for Global ReLeaf forest funding. For information, con-

tact American Forests at www.amfor.org/grc/grdesc.html

NADF Awards—Initial nominations due Sept. 1; final packet due Oct. 1. Contact Don Mueller, DNR-Forestry, 651/772-6148.

MN ReLeaf Grants—see article on page 16.

New Publications

After the Storm: What to do with Storm Damaged Yard Trees. Revised fact sheet. Contact MN DNR - Forestry Division 651/772-7925.

Caring for Your Native Woodland, Meredith Cornett. Homeowner Fact Sheet Series. Contact MN DNR -Forestry Division 651/772-7925.

Oak Wilt in Minnesota, David French and Jennifer Juzwik, College of Natural Resources, U of MN. Contact U of MN Extension Service Distribution Center 612/625-8173.

Patterns of Tree Failure, Ed Hayes. Published in Tree Care Industry, April 1999. Contact MN DNR -Forestry Division 651/772-7925.

Planting and Caring for Community Trees: Together, We Can Do It. MnSTAC Report to the 1999 State Legislature. Contact MN DNR - Forestry Division 651/772-7925.

Tree City USA (Video, 7 min., 45 sec.) Contact National Arbor Day Foundation, 402-474-5655.

Internet

- International Society of Arboriculture: www.ag.uiuc.edu/~isa
- Minnesota Department of Natural Resources: www.dnr.state.mn.us
- National Arbor Day Foundation: www.arborday.org
- National Urban and Community Forest Advisory Council: www.treelink.org/connect/orgs/nucfac/index.htm
- Tree Trust: <http://willow.ncfes.umn.edu/treetrust/trust2.htm>

Reforestration: What Works Best?

Local governments, organizations and individuals throughout the state are working together with the Minnesota Department of Natural Resources (DNR) to protect natural resources and provide recreational opportunities. Financial assistance is available through a variety of grant programs to help build these partnerships.

From playgrounds our children enjoy today, to prairie acquisitions that ensure preservation for future generations, to trails for long distance travel, to facilities that provide access to our state's water—grant programs help make it happen. There are three types of grants available: **local** grants, **trail** grants and **cooperative water recreation** grants. Within each type of grant, there are endless possibilities for restorative and proactive projects.

Through the grants and the improvement projects they make

possible, we learn a lot about reforestation. Through more focused monitoring of various projects, we are now learning even more...including techniques and strategies that are most successful in achieving long-term gains.

Watch your fall *Advocate* for information gleaned from monitoring several grant projects. For grant information in the meantime, contact the MN DNR at: —651/296-6157 (metro) —1-888-MINNDNR (646-6367) toll free, or on the internet at

www.dnr.state.mn.us

Minnesota Shade Tree Advocate

A quarterly newsletter published by the Minnesota Shade Tree Advisory Committee.

Managing Editorial Group: MnSTAC Education Committee; Gary R. Johnson, Chair

Editor-in-Chief: Jan Hoppe

Design: Jim Kiehne

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Address inquiries to:

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Minnesota ReLeaf: New Grant \$\$ Available to Help Your Trees

The Minnesota Department of Natural Resources—Division of Forestry now has \$875,000 in matching funds available

for local communities and non-profit organizations through the Minnesota ReLeaf Program. These funds were approved by the Minnesota Legislature in part from the Natural Resources Trust Fund. These competitive matching grants can be used for:

■ **Community Forest Inventories**, to assess the extent and condition of your trees as the first step toward integrating management of natural resources into public infrastructure, zoning and comprehensive planning processes. \$75,000 available; maximum \$7,500 per project.

■ **Community Tree Planting**, to plant predominantly native trees on public and private property in Minnesota communities. \$270,000 available; maximum \$7,500 per project.

■ **Community Forest Health**, to implement practices that have a direct and immediate impact on tree health and to promote educational programs to sustain community-wide tree health efforts. Any of the Forest Health funds may be used for oak wilt suppression, but \$290,000 are being targeted specifically for oak wilt control. \$515,000 available; maximum \$20,000 for oak wilt, \$10,000 for other Forest Health projects.



Who's Eligible?

Local units of government and non-profit organizations may apply. Grant recipients must contribute at least 50% of the total project cost in either cash or in-kind contributions. Applicants may receive more than one grant.

Application Guidelines And Deadlines

Foresters are available to guide you through the application process. The application packet includes completed sample applications, examples of eligible and previously funded projects and fact sheets on a variety of topics. Each application must include a Needs Determination signed off by your DNR Area Forester to help ensure that the project meets basic program criteria.

Community Forest Health applications are available now and may be submitted any time. They will be awarded by Regional ReLeaf Steering Committees on: July 15, 1999; November 1, 1999; June 1, 2000; and November 1, 2000.

Community Forest Inventories and **Tree Planting** applications will be available July 22, 1999 and must be received by DNR by November 1, 1999.

For More Information

Contact your local DNR Area Forestry office. Check the phone book or call the DNR Info Center toll free at 1-888-646-6367 for the Forestry office nearest you. For an application packet, see the DNR website at www.dnr.state.mn.us/forestry/releaf.html or call DNR Metro Forestry at 651/772-7925.

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