



Wisconsin Urban & Community Forests

A Quarterly Newsletter of the Wisconsin Department of Natural Resources, Forestry Division

Mechanized Harvesting of Urban Trees in Oak Creek

by Don Peterson, President
Renewable Resource Solutions, LLC

With financial assistance from a US Forest Service Wood Education Resource Center grant, a unique group of entities collaborated to demonstrate and analyze the effectiveness of mechanized cut-to-length logging equipment to remove and process urban trees in a number of different settings. The City of Oak Creek agreed to participate in the project because it is the site of a large emerald ash borer infestation in Wisconsin.

Other public entities involved included the DNR Division of Forestry, WI Department of Agriculture, Trade and Consumer Protection, and the US Forest Service Forest Products Lab. A variety of services was provided from the private sector: Timber Resources Sustainable Resources Institute, Inc; Northeast Forestry Services and Vermeer Wisconsin. Northeast Forestry Services, a certified Wisconsin Master Logger company, was contracted to do the felling, processing and forwarding of all designated trees with their harvester and forwarder.

The purpose of the weeklong demonstration in November 2010 was to determine the cost effectiveness and efficiency of using this type of equipment in urban situations, and to determine if enough material could be harvested to economically market sawlogs, pulpwood and chips.

Results

In five days, 516 trees from streets, yards, parks and small woodlots were cut, removed and processed, with 65 of these being less than 5 inches in diameter. The cost of the actual demonstration was approximately \$26,000, broken down as follows: logging contractor/equipment expenses (54 percent), City of Oak Creek personnel/equipment expenses (42 percent) and material disposal (4 percent). The logging contractor/equipment expenses included contract bid price, lodging/meal/travel expenses, and contract trucking of harvester and forwarder. City of Oak Creek expenses included personnel during and after (cleanup) demonstration and equipment used for those activities.

Photo: Rebecca Lane, City of Oak Creek



Mechanized urban tree removal was successfully piloted in Oak Creek.

Aside from showing that it could be economical to use logging equipment for urban tree removal, the other point of this demonstration was to see if the volume of wood produced in a week made it viable to utilize wood product markets to offset disposal costs. Combining the products, it cost approximately \$900 to process and utilize/dispose of 470 trees (46 of which were utilized for firewood).

The three products produced were sawlogs, pulpwood and biomass. Sawlogs yielded approximately 2600 board feet and \$600 in income. The trees cut on Tuesday would have doubled this sawlog volume, but logistically there was no place to yard these logs, so all of the trees that day were forwarded to two firewood users in the immediate vicinity. Approximately 40 cords of pulpwood were marketed, which turned out to be a nearly break-even proposition. The wood was railed to the NewPage pulpwood mill in Wisconsin Rapids, but the expense of trucking the pulpwood to the rail siding was costly due to lack of log trucks in the area. Additionally, an estimated 150 tons of biomass were produced; however, though markets exist for this material (energy and mulch), logistics of chipping and having chip vans available never worked out, so in the end there was a \$1500 disposal fee for this material.

Equipment Efficiency

Forwarder

Average time to load – 15 minutes

Average time to unload – 3 minutes

Travel distance – varied from 100 yards to 2 miles



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Inside this issue:

Community Profile: Village of Sturtevant.....	2
Tree City USA Communities	3
Bird City USA.....	4
Fitchburg's Land Cover & Ash ID Models	5
Tree Profile: Korean Pine	6
What Damaged This Tree?	7
Urban Tree Health Matters.....	8
Coming Events	8
Urban Forest Insect Pests.....	9
DNR Grant Awards	11
UF Council Awards.....	13
Idea Exchange.....	14
Research Notes.....	14
UF Resources.....	15
DNR UF Contacts.....	16

2



Community Profile:

Population: 6970
 Street Trees: 1282 (134 ash)
 Number of Parks: 4 parks
 5 storm water areas
 Park Acreage: ~157
 Kirkorian Nature Preserve: 28 acres

Program Profile:

Equipment:
 1 bucket truck
 1 chipper
 4 chainsaws
 Staff:
 4 Department of Public Works

Community Profile:

Village of Sturtevant

by Linda Busha, Village Trustee
 and Charles Stachowski, Director of Public Works

Incorporated in 1907, the village of Sturtevant is located in the southeast corner of Wisconsin, just two miles west of Racine. Like many communities, tight budgets and a small public works department have impacted how the village addresses its forestry and park needs. To keep a positive image, the village had to seek creative ways to maintain its trees and more than 157 acres of parks and green spaces. The village has integrated full-time staff efforts, forestry grants and community volunteers into a very successful maintenance program.

With only four DPW employees, the village has come to rely on community volunteers and occasional DNR Urban Forestry Grants to help maintain, record and clean up parks and green spaces. With continued tight budgets and reduced state funding in the foreseeable future, grants and volunteers will continue to be vital in the village's funding and personnel arsenal.

In 2005, the village received an Urban Forestry Grant to develop a tree management program. The village hired a local arborist to identify and map all trees on village property, modify the village tree ordinance and develop a list of allowable trees for specific applications, e.g., the street parkways. Over 1280 trees were identified and documented in the village's GIS mapping system for future use and maintenance. Due to the difficulty of accessing the interior of Kirkorian Nature Preserve, this area was not documented. Kirkorian Nature Preserve—a local 28-acre nature preserve with several ponds—is named for former village president Abe Kirkorian.



Photo: Judy Wilson, Sturtevant resident

On October 22, 2011, Make A Difference Day, Sturtevant community volunteers gathered at Kirkorian Nature Preserve to continue invasive species removal and trail maintenance.

The inventory identified 133 ash trees on village property. A staff member is becoming certified to apply pesticide to prevent the spread of emerald ash borer into village ash trees. EAB has been detected in nearby towns and counties. The cost of ash tree removal would be prohibitive, especially on an already tight budget.

Another component of the 2005 grant involved acquiring bare-root trees and enlisting community volunteers to plant them in a holding bed, under the direction of the arborist. After several years, the trees were moved to permanent locations along street parkways, with a majority going along the Kirkorian Nature Preserve parkway.

In 2011, the village was awarded a second Urban Forestry Grant for tree planting and removal. This project integrated all three components (i.e., staff, volunteers and grants) of the village maintenance program. The grant focused primarily on removal of large, old, hazardous willow trees in the Kirkorian Nature Preserve. Many of these trees were over 15" in diameter and had numerous hanging branches. Most were rotten and posed a safety hazard to children that played in

Continued on page 12



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Articles, news items, photos and ideas are welcome.

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Tree City USA Communities, 2011

by Dana Dentice, Urban Forestry Communication Specialist
DNR Division of Forestry

Congratulations to Wisconsin's newest Tree City USA designees—Reedsburg and returning Ashland, Fredonia, Lodi and Mayville! The number of Tree City USA communities in the state is **184!** Twenty-three of the recertifying Tree Cities also received a Growth Award, going above and beyond the Tree City USA program standards.

To be recognized as a Tree City USA, a community must meet four requirements. It must have: 1) a designated tree board or forestry department, 2) a tree care ordinance, 3) an annual forestry program expenditure of at least \$2 per capita, and 4) observe and proclaim Arbor Day. The Tree City USA program, sponsored by the Arbor Day Foundation and administered in Wisconsin by the DNR, provides communities with a

tangible goal and national recognition for their community forestry efforts.

The Arbor Day Foundation also sponsors the Tree Line USA program. **Thirteen utilities** with Wisconsin service areas received recognition in 2011 by meeting the following criteria: 1) providing quality tree care that follows national tree care and protection standards, 2) providing annual worker training, and 3) sponsoring ongoing tree planting and public outreach.

A college or university can be recognized as a Tree Campus USA for effectively managing their trees, engaging their student population in forestry efforts and connecting with their community to foster healthy urban forests. **Three colleges and universities** (listed right) are Tree Campuses! 🌳

3

To learn how your community can become a Tree City USA, contact your DNR regional urban forestry coordinator (refer to page 16) or visit dnr.wi.gov, keywords "Tree City USA."

2011 Tree Cities



TREE CITY USA

Adams

Albany

Algoma*

Allouez

Amherst

Antigo*

Appleton*

Ashland

Ashwaubenon

Baldwin

Baraboo

Bayfield

Bayside*

Beaver Dam

Belgium

Bellevue*

Beloit

Bloomer

Blue Mounds

Brillion

Brookfield

Brown Deer

Cambridge

Campbellsport

Cedarburg

Chenequa

Chilton

Clayton

Clinton*

Clintonville

Columbus

Combined Locks

Cottage Grove

Cudahy

De Pere

DeForest

Delafield

Delavan

Denmark

Dodgeville

Dresser

Dunn, Town (Dane)

Eau Claire*

Edgar

Elkhart Lake

Elkhorn

Elm Grove

Endeavor

Evansville

Fitchburg*

Fond du Lac*

Fontana

Fort Atkinson

Fort McCoy

Fox Lake

Fox Point

Franklin

Fredonia

Fremont

Germantown

Gilman

Glendale

Grafton

Grand Chute, Town (Outagamie)

Green Bay

Green Lake

Greendale

Greenfield*

Greenville, Town (Outagamie)

Hales Corners

Hartford

Hillsboro

Hobart

Horicon*

Howard

Hudson*

Jackson

Janesville

Jefferson

Johnson Creek

Kaukauna

Kenosha

Kewaunee

Kimberly

La Crosse

Lake Geneva

Lake Mills

Little Chute

Lodi

Madison, City

Madison, Town (Dane)

Manitowoc*

Maple Bluff

Marinette

Marion

Marshfield

Mayville

McFarland

Medford

Menasha

Menasha, Town (Winnebago)

Menomonee Falls*

Menomonie

Mequon

Merrill

Middleton*

Milwaukee*

Mineral Point

Monona

Monroe

Monticello

Mount Horeb

Muskego

Neesah

New Berlin

New Glarus

New Holstein

New London

North Fond du Lac

Oak Creek*

Oakfield

Oconomowoc

Oconto

Onalaska

Osceola

Oshkosh

Paddock Lake

Phillips

Platteville*

Plover

Plymouth

Port Washington

Portage

Pound

Princeton

Racine

Reedsburg

Rice Lake

Richland Center

Ripon

River Falls*

Rosendale

Rothschild

Saukville

Seymour

Shawano

Sheboygan

Sherwood

Shorewood

Shorewood Hills

Spooner*

Stevens Point*

Stoughton*

Sturgeon Bay

Sun Prairie

Superior

Thorp

Tomahawk

Turtle Lake

Two Rivers

Valders

Verona

Viola

Washburn

Waterford

Waterloo

Watertown

Waukesha

Waunakee

Waupaca

Waupun

Wausau

Wautoma

Wauwatosa

Wescott, Town (Shawano)

West Allis

West Bend

Weyauwega

Whitefish Bay

Whitewater*

Whiting

Williams Bay

Wisconsin Dells

Wisconsin Rapids



TREE LINE USA
2011 Utilities

Alliant Energy
American Transmission Co.
Central Wisconsin Electric Cooperative
East Central Energy
Madison Gas & Electric
Pierce Pepin Cooperative
Richland Electric Co-op
Shawano Municipal Utility
Stoughton Utilities
Vernon Electric
WE Energies
WI Public Service Corp.
Xcel Energy



Tree Campus USA
2011 Colleges

UW-Oshkosh
UW-Stevens Point
Western Technical College



Tomahawk students stand beside an elm tree planted last year to commemorate the city's 25th anniversary as a Tree City.

Asterisk (*) indicates Growth Award recipient.
Bold Text indicates New Tree City.

Bird City Wisconsin

by Carl Schwartz, Coordinator
Bird City Wisconsin

4

By summer, the distinctive Bird City Wisconsin logo will welcome residents and visitors alike to 50 communities in the state. Perhaps you already have seen the signs and wondered just what the heck Bird City Wisconsin was. Or maybe you already know because you're lucky enough to live in one.

When an alliance of state bird conservation groups put together their plan for Bird City Wisconsin, they modeled it after the widely successful Tree City USA community forestry recognition program. Their hope was to do for urban bird conservation what the Arbor Day Foundation has done to enhance urban forestry.

Bird City developed 22 criteria across five categories, including habitat creation and protection, community forest management, limiting hazards, public education and recognizing International Migratory Bird Day. Its aim was to see local governments expand their conservation efforts while educating residents to do more.

In return, BCW offers highly visible recognition to those that meet at least seven criteria: two street signs, a flag, a plaque and its own page on the BCW website. Its emblem was designed by renowned Wisconsin landscape painter Tom Uttech and his wife, designer Mary Uttech.

The program has benefited from the support of DNR's Forestry Division as well as the presence of 178 Tree Cities in Wisconsin. So it comes as no surprise that many of Wisconsin's new Bird Cities took advantage

of Tree City status to meet BCW's Effective Forest Management criteria. While applicants could demonstrate another accomplishment, Tree City communities understand the value of a recognition program and appreciate how important habitat improvement is to bird conservation.

BCW is using its website, www.birdcitywisconsin.org, to guide foresters, parks directors, city planners, Audubon chapters, birding clubs, natural landscape groups and others through the process, while offering how-to details on new conservation strategies. It also documents how communities earned recognition, providing tips for those who follow.

Now into its second year, Bird City Wisconsin has:

- Recognized 50 cities, villages, towns and counties and is working with more than three dozen other prospective Bird Cities. A new round of applications is due July 1.
- Seen all 15 of its inaugural-year communities renew their recognition, with 5 upgrading to High Flyer status by undertaking additional conservation efforts.

Noel Cutright, founder of the Western Great Lakes Bird and Bat Observatory, notes, "BCW provides an excellent vehicle for communities to harness the human connection with birds—reaching beyond bird watchers to new and essential audiences Over again, it has been demonstrated that a place that is a haven for birds and is doing good things to benefit them is a better place in which to live and work."

BCW also stresses the economic incentives for practicing conservation. Birds are unheralded assistants to backyard gardeners, flower fanciers, private and municipal landscapers, farmers and foresters. Without birds, communities would have to spend far more money keeping natural systems in balance. Insect-eating birds reduce the need for chemical pest control. Birds also are voracious eaters of weed seeds and rodents.

With funding from Together Green and the Natural Resources Foundation of Wisconsin, BCW is led by the Milwaukee Audubon Society in partnership with the [Wisconsin Bird Conservation Initiative](#) and six other bird conservation organizations.

For information about Bird City or for a speaker to present the program, contact Carl Schwartz at cschwartz3@wi.rr.com, 414-416-3272. 🌿



Photo: Nancy Nabak, Bird City Green Bay

On Arbor Day 2011, a demonstration tree planting was held in Green Bay, one of Wisconsin's inaugural Bird Cities. This was done in collaboration with many local organizations and schools, as well as Tree City USA.

Wisconsin's 50 Bird Cities

Bailey's Harbor	Evansville	La Crosse	Muskego	Presque Isle	Taylor County
Bayfield	Fontana	Lake Geneva	New London	Racine	Town of Grafton
Bayside	Fond du Lac	Manitowish Waters	Newburg	River Falls	Trempealeau
Beaver Dam	Fox Point	Manitowoc	Oconomowoc	Sauk Prairie	Wausau
Brookfield	Grantsburg	Marquette County	Oconto	(Sauk City/ Prairie du Sac)	West Bend
Brown County	Green Bay	Mayville	Oshkosh	Sherwood	Whitefish Bay
Chenequa	Hales Corners	McFarland	Ozaukee County	Shorewood Hills	Williams Bay
Elm Grove	Horicon	Mequon	Plover	Stevens Point	
Ephraim	Kenosha	Middleton	Plymouth		

Project Profile:

Fitchburg's Land Cover and Ash Identification Models

by Felipe Avila, GIS Engineering Specialist
adapted by Dana Dentice, Landscape Architect Intern
City of Fitchburg

The City of Fitchburg was awarded a DNR Urban Forestry Grant in 2011 involving use of high-resolution aerial imagery and light detection and ranging (LiDAR) remote sensing data to create a more accurate land cover model than has traditionally been available.

A long-term goal of the project was to estimate the amount of land cover types, including tree cover, in Fitchburg. Like i-Tree Canopy, the land cover data can be used to set canopy goals, track success and provide data inputs for other tools, models and municipal applications, such as storm water management.

A second objective of the project was to differentiate ash trees from other tree types using the land cover model and near infrared (NIR) orthoimagery. This project would allow staff to determine if the NIR infrared wavelength signatures of trees would be unique enough to allow for species identification in the fall, when trees are undergoing phenological changes. If successful, city staff could better prepare for the impact of emerald ash borer that may infest trees in the Dane county area in the next three to five years.

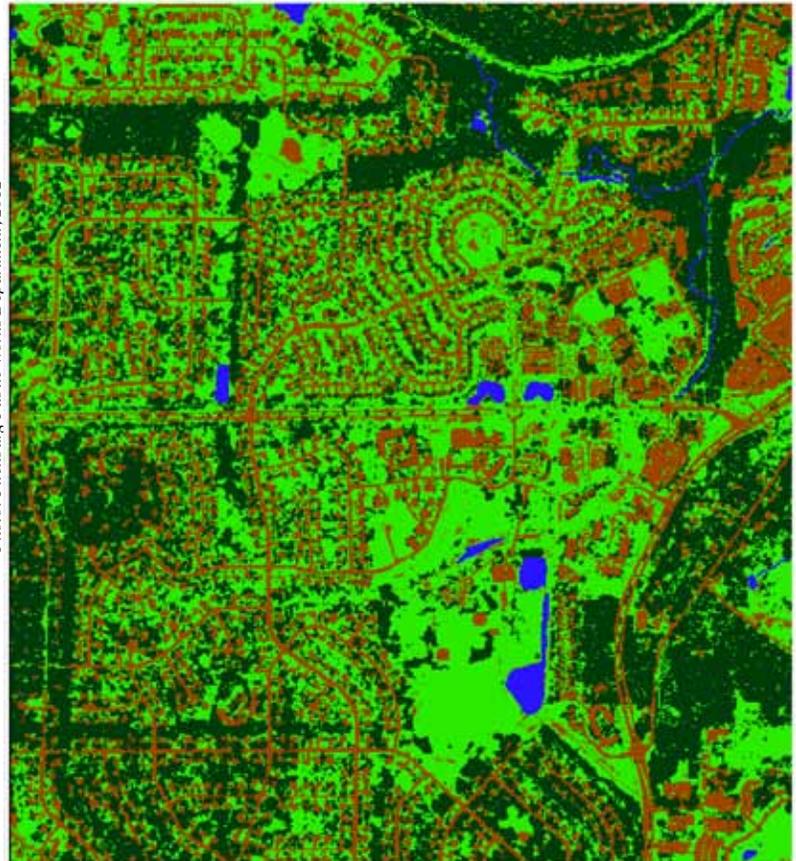
This project also provided the opportunity to determine if such models can be created at reduced cost by using readily available software and data sets. The City of Fitchburg partnered with Ayres Associates and the University of Wisconsin-Madison Forestry Department to obtain imagery and benefit from their experience with remote sensing technology.

Land Cover Model

The city contracted with Ayres Associates to provide high-resolution, leaf-off imagery in 2009. Normally leaf-off imagery is of marginal value when performing a land cover analysis, but when combined with LiDAR data, which captures elevation, a model can be built. Fitchburg acquired 1-foot NIR imagery and 2-foot LiDAR imagery across the entire city for use in the public works department. Since the city is a member of the Fly Dane consortium, the cost for obtaining imagery was significantly reduced.

Fitchburg GIS Engineering Specialist Felipe Avila processed the NIR and LiDAR data sets in ArcGIS 10 software to extract land cover types. The end product is a 12-foot land cover model with four land cover classifications: trees, grass/agriculture, water and impervious cover. The Fitchburg land cover model shows about 24 percent tree cover and 62 percent

Photo: Fitchburg Public Works Department, 2012



Grass
Trees
Water
Impervious

grass/agriculture for the entire city, and 31 percent tree cover and 43 percent grass/agriculture in the urban service area. This is not surprising given that about half the city (roughly 11,000 acres) is comprised of agricultural land and most of it lies outside the urban service area.

The land cover model cannot accurately classify all areas. Bare earth and gravel areas are classified as impervious, some tree cover is not captured and some areas are misclassified as tree cover. The model isn't perfect, but it does provide a reasonable estimate of land cover types.

Ash Identification Model

The City of Milwaukee has had success identifying tree species using hyperspectral imaging, but the cost makes it impractical for smaller communities. Fitchburg staff attempted a similar analysis using low-cost or free imagery.

In a 2009 study, Avila attempted to identify ash trees using 1-meter, leaf-on NIR imagery from USDA.

Continued on page 7

Fitchburg's land cover model (based on 2009 aerial imagery) shows tree cover in the northern part of the city.

6

Community Tree Profile:

Korean pine (*Pinus koraiensis*)

by Laura G. Jull, Associate Professor & Extension Specialist
Dept. of Horticulture, University of Wisconsin–Madison

Native To: Korea, Manchuria (northeast China), far eastern Russia and Japan

Mature Height: 35–50' tall; can grow larger

Spread: 15–30' (depends on cultivar)

Form: Broad, loose, pyramidal form with wide-spreading, open branching all the way to the ground

Growth Rate: Slow

Foliage: Evergreen, soft, needle-like; stiffer leaves in fascicles of five; 3–5" long, dark green to blue-green with white stomatal bands; needles remaining 2–3 years, fine texture with serrated margins along the needles.

Buds and Stems: Young stems often with reddish brown pubescence (hairs), similar to Swiss stone pine (*Pinus cembra*), becoming darker brown with age; smooth older stems; terminal buds are large, cylindrical, very resinous with sharp tips.

Fall Color: None; evergreen, but does lose some inner needles each fall

Cones: Borne solitary or in small clusters at branch ends; cylindrical, 4–6" long, 2–2½" wide (wider and thicker cones than eastern white pine, *Pinus strobus*); short stalked, very resinous, yellowish brown; lacking prickles on tips of cone scales; seeds are large, wingless and edible (pine "nuts").

Bark: Thin, smooth, gray-brown, peeling into scaly gray-brown flakes; reddish brown inner bark



Korean pine (*Pinus koraiensis*)

Photo: Plants For A Future, <http://plat.org>

Site Requirements: Not as particular to soils as eastern white pine, but intolerant to poorly drained soil. Requires full sun and well-drained soil; sensitive to juglone. (Don't plant near walnut trees.)

Hardiness Zone: 3b–7a

Insect & Disease Problems: Sensitive to aerial salt spray; resistant to white pine blister rust; can develop root rot on poorly drained soils.

Suggested Applications: Korean pine looks especially beautiful planted as a single specimen or in masses to screen views. It is an excellent, slower-growing alternative to eastern white pine and an excellent, low-maintenance evergreen specimen tree for both commercial and residential landscapes.

Limitations: Hard to find in nurseries, but more nurseries are carrying this species, especially the cultivars. Slow growing and sensitive to poor drainage and salt spray.

Comments: More resistant to winter burn and storm damage than eastern white pine. Korean pine deserves to be utilized more in the landscape due to its attractive, blue-green to silver-blue needles, showy, long, resinous cones and better adaptability than eastern white pine. The pine nuts can be used in salads, pesto or as a light snack. It is cold hardy to hardiness zone 3b, hence it can be planted in most of Wisconsin. Good alternative to the pest-prone Austrian pine (*P. nigra*) and Scots pine (*P. sylvestris*) in residential landscapes and is non-invasive.

Common Cultivars or Selections: (numerous other cultivars, but rarely available)

'Bergman's Best': upright, compact form; dark, blue-green needles; 7' tall and 4' wide in 10 years

'Dwarf Form': slow growing, upright form; 5' tall and 4' wide in 10 years; sometimes called 'Nana'

'Jack Corbit': upright form; slow growing; blue-green needles with slight yellow variegated band on needles; 6' tall and 3' wide in 10 years



Korean pine needles

Photo: Ed Hasselkus, Professor Emeritus, UW–Madison

Korean Pine, continued from page 6

‘Morris Blue’: two-toned, very blue-green needles; large growing; very beautiful tree

‘Oculus Draconis’: upright form; blue-green needles with variegated yellow band running down the needle, though not easily seen; needles tend to point downward, giving the tree a weeping look; large form

‘Silvurray’: narrow, upright-to-pyramidal form; silvery blue needles; slow growing; sometimes sold as ‘Glaucu’; large growing; very beautiful tree

‘Winton’: long, green needles with blue interior; wider tree than tall; bushy form

References:

Durr’s Encyclopedia of Trees and Shrubs, 2011, by Michael A. Durr, Timber Press, Portland, OR.

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The Right Tree Handbook, 1991, by H. Pellett, N. Rose, and M. Eisel, University of Minnesota Extension Service, St. Paul, MN.

North American Landscape Trees, 1996, by A. L. Jacobson, Ten Speed Press, Berkeley, CA.

Plants that Merit Attention: Vol. 1 Trees, 1984, The Garden Club of America, J. M. Poor, (ed.), Timber Press, Portland, OR. 🌿

Fitchburg Land Cover, continued from page 5

Unfortunately, this method resulted in only 30 percent accuracy. The study showed that the NIR wavelength signatures of individual tree species are too similar to allow species or even genus identification. After discussions with faculty at UW–Madison, Ayres Associates and DNR Urban Forestry staff, it was determined that ash identification may prove successful if aerial imagery is obtained in the fall when trees are undergoing phenological changes due to changing weather.

In fall 2010, Ayres Associates acquired four 1-meter NIR imagery data sets of a sample urban area in Fitchburg. For the 2011 project, Avila processed the data sets using ArcGIS 10 extraction software, the tree cover data provided by the land cover model and locations of field-inventoried ash trees. In this second attempt to identify ash trees, the model was, again, about 30 percent accurate. The software had difficulty picking out known ash and misidentified other trees as ash.

Conclusion

The ash mapping study shows that NIR imagery is too coarse for ash tree identification. As technology

What Damaged This Tree?

7

Turn to page 15 to find out...



Photo: Mark Drow

advances and hyperspectral imaging becomes more affordable, it may be more practical for smaller communities to do ash tree mapping of this kind.

The DNR Urban Forestry Grant also enabled Fitchburg to create a process for land cover classification using significantly higher-resolution imagery. This was done at a reduced cost by using commonly available ArcGIS software and readily available remote sensing data. For the next phase of the project, the city hopes to use the land cover data to run a comprehensive analysis of the Fitchburg urban forest at various scales (i.e., parcel, neighborhood and city).

The land cover model is intended to provide a broad overview of the makeup of the landscape. It is not accurate enough to be considered a replacement for field verifying actual conditions. However, when used as a planning and public information tool, the model provides a powerful visual and data-rich representation of the state of the urban forest. The land cover model is one that can be replicated by other communities.

For more information, contact Felipe Avila, *City of Fitchburg GIS Engineering Specialist*, 608-270-4277 or Felipe.Avila@city.fitchburg.wi.us. 🌿

8

Urban Tree Health Matters:

Notes from Plant Disease Diagnostics Clinic: Tree Diseases 2012? Rewind, Replay 2011

by Brian D. Hudelson, Director
UW–Madison/Extension Plant Disease Diagnostics Clinic

I was charged for this edition of *Wisconsin Urban & Community Forests* with providing my predictions for probable tree disease problems in 2012. As I prepared to write my article, I realized that my best course of action might be to simply resubmit the article I submitted to the newsletter last May. From what I've been seeing since the end of the last growing season, I believe that 2012 at the PDDC will look very similar to 2011.

Winter Injury

With moderate temperatures for much of the winter and little snowfall or rainfall in many areas of the state, evergreen species are likely to suffer from winter injury. As I have noted in the past, winter injury is oftentimes a water stress-related phenomenon in plants that do not have sufficient water stored internally for use over the winter. With warmer temperatures prevailing, evergreen plants are likely respiring more and using what internal water stores they have. If their root systems are not taking up sufficient water (likely, given that soil temperatures do not warm as quickly as air temperatures), dehydration and subsequent browning of foliage is likely. I most often see winter injury

on yews, but in 2011 spruce trees also showed substantial browning. I expect this trend to continue in 2012. Proper watering once the frost is out of the ground will be critical to minimize severity of this problem. I typically recommend that established ev-

ergreens receive roughly one inch of water per week. If Mother Nature does not cooperate, then I suggest applying water at the drip lines of trees and shrubs (or more extensively if possible) using a soaker or drip hose. Proper mulching (up to two inches on heavier, clay soils and up to four inches on lighter, sandy soils) as well as proper watering into the fall will hopefully help minimize winter injury as we move into 2013.

In addition to water-related winter injury, I am concerned that temperature-related winter injury may be a problem as well. With high air temperatures, trees and shrubs will begin to come out of dormancy early (if they have not begun to do so already in some areas). If temperatures subsequently plummet, cold injury to buds and resulting branch dieback will likely occur.

Needle Blights/Casts

I noted substantial problems with *Rhizosphaera* needle cast of spruce (caused by *Rhizosphaera kalkhoffii*) and Swiss needle cast of Douglas fir (caused by *Phaeocryptopus gaeumannii*) in the spring of 2011. (See <http://pddc.wisc.edu/conifer.html> for details on these diseases and their control.) I then saw a second peak of symptoms caused by these diseases in the late summer and early fall. I have even received some needle cast samples over the winter. Interior needle browning on lower branches of larger spruces and Douglas firs, as well as needle loss, are typical symptoms caused by both *Rhizosphaera* needle cast and Swiss needle cast. I expect symptoms to continue to develop into

Continued on page 10

Winter injury on spruce



Photo: UW–Madison PDDC



Fruiting bodies (reproductive structures) of *Phaeocryptopus gaeumannii* on the undersurface of Douglas-fir needles

Photo: UW–Madison PDDC

If there is a meeting, conference, workshop or other event you would like listed here, please contact Cindy Casey. Please see back cover for contact information.

Coming Events:

June 25–27, 2012—APWA Sustainability in Public Works Conference, Omni William Penn Hotel, Pittsburgh, PA. Visit www.apwa.net/sustainability.

June 28, 2012—Up by Roots: Healthy Trees & Soil for the Built Environment workshop, Rochester, MN. Visit www.isa-arbor.com/events/eventsCalendar/index.aspx or call 507-382-2515.

August 9, 2012—Wisconsin Nursery Association Summer Field Day & Trade Show, Wauwatosa, WI. Call 414-529-4705.

August 11–15, 2012—ISA International Conference & Trade Show, Portland, OR. Visit www.isa-arbor.com/events/conference/index.aspx.

Urban Forest Insect Pests:

Arborvitae Leafminer

by Linda Williams, Forest Health Specialist
DNR Northeast Region

Photo: Petr Kapitola, Bugwood.org



Arborvitae leafminer adult

Photo: Connecticut Agricultural Experiment Station, Bugwood.org



Arborvitae leafminer larva

Photo: Linda Williams, WDNR



Exit hole in arborvitae leaf caused by arborvitae leafminer

9

If the tips of the foliage on northern white-cedar, also known as arborvitae, are turning brown, it may indicate an infestation by arborvitae leafminer (*Argyresthia thuiella*). However, there are other reasons cedar trees can have brown foliage, such as winter injury, salt damage, fungal disease and other insect feeding.

Arborvitae leafminer adults are tiny (8 millimeters in length), silvery grey moths that are active during June and July. After they mate and lay eggs, the tiny larvae (6 millimeters in length when mature) hatch and bore into the arborvitae leaf. They begin mining inside the leaf, leaving a dead portion wherever they have fed. The larvae will continue mining throughout the rest of the summer and fall. Foliage browning may begin in the fall, or more commonly will appear over the winter when it is often misdiagnosed as winter injury. Arborvitae leafminers overwinter as larvae within the leaf and will continue feeding in the spring before they pupate. Later, they will chew their way out of the leaf, leaving a tiny, round exit hole 1 to 2 millimeters in diameter. According to various sources, the damage is usually most severe on the south sides of trees, but damage can also occur throughout the tree.

Since there are numerous things that can cause arborvitae foliage to turn brown, it is important to identify the cause before implementing control measures. To verify arborvitae leafminer, use a hand lens to look for the tiny exit holes and check the brown foliage to see if it is hollow and filled with frass or excrement. Control can be achieved for select trees by using a systemic insecticide or foliar treatments. Otherwise, you can let nature handle it by allowing some of the many parasitoids that affect arborvitae leafminer to control the population. 🌿

November 6–9, 2012—*WPRA Annual Conference & Trade Show*, Wisconsin Dells, WI. Visit www.wpraweb.org/.

November 8–10, 2012—*TCI Expo*, Baltimore, MD. Visit http://tcia.org/Public/meetings_TCI_EXPO2012.htm.

November 14–16, 2012—*Partners in Community Forestry Conference*, Sacramento, CA. Visit www.arborday.org.

November 28–December 21, 2012—*ASCA Annual Conference*, San Diego, CA. Visit www.asca-consultants.org/edprograms/conference.cfm. 🌿



Harvester

The following tables illustrate the harvester equipment processing times that were recorded for felling and cutting trees into transportable lengths. Times were not recorded for all felled trees.

10

Harvester Processing Time Analysis	Average Stump Diameter (weighted)	Trees	Minutes to Fell & Process	Average Minutes/Tree
Street/Yard Trees	14	119	400.7	3.4
Non-Street/Yard Trees (Wooded Areas)	10	201	324	1.6

Conclusion

Overall, it was proven that using mechanized logging equipment could be economical for urban tree removal. The only definitive requirement for the equipment is that it be rubber tired, with the specific type of equipment used for felling and/or processing (dangle head harvester, fixed

head harvester, feller-buncher) being dependent on site variables (i.e., tree size, hazards, etc.).

Each situation needs to be evaluated; mechanized equipment will not work in all situations. There has been some discussion of using a dedicated harvester/forwarder crew for urban situations. This could definitely work, but working in a typical forest logging situation gives a logger an opportunity to become very proficient with their equipment by cutting hundreds of trees a day. Urban situations would not be a good match for all logging crews. It is critical to match the crew and equipment to the project. It would be essential to clearly define work in the contract.

Utilizing trees for various products can be difficult but it can also be cost effective. The more it is done, the easier it will get. It is also a good idea to share information with other entities who have tried it, to learn from their successes and mistakes.

Additional Information

Watch a video of the project at <http://dnrmedia.wi.gov/main/Viewer/?peid=504a7d15adae42a28a17f7961440054>.

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Terry Mace, DNR Forest Products Specialist, Terry.Mace@Wisconsin.gov, 608-231-9333

Rebecca Lane, Oak Creek City Forester, rlane@oakcreekwi.org, 414-768-5861

Photo: Rebecca Lane, City of Oak Creek



A harvester fells a 25-inch ash bole after the top of the tree was removed with a series of cuts.

Tree Diseases 2012, continued from page 8

the spring and I will likely spend a fair amount of time hunched over my dissecting microscope looking for the small, black fruiting bodies (i.e., reproductive structures) of the pathogens involved in these diseases.

Deciduous Tree and Shrub Leaf Diseases

One non-evergreen disease that I expect to see fairly commonly in 2012 is tar spot; 2011 was a banner year for this disease. I typically get calls about or samples of tar spot on maple every year from clients who live in Wisconsin counties near Lake Michigan. In 2011, not only was the disease prevalent on maples in eastern counties, but also in south central Wisconsin. (I found infected leaves in my own yard!) I also had reports of tar spot in some western Wisconsin locations and even saw the disease on winterberry this year.

Tar spot (caused by several species of the fungus *Rhynchospora*) is characterized by the formation of large, often 3/4-inch-diameter or larger, tar-like spots on leaves of susceptible trees and shrubs. The spots may or may not be surrounded by yellow haloes. If a large number of infections occurs on a leaf, the tissue around the spots may collapse and dry, in some cases leading to leaf drop. While tar spot can cause defoliation in some years, in general it is a cosmetic disease. The best way to manage tar spot is by making sure to carefully collect up infected leaves after they have fallen from trees



Tar spot of maple

in the autumn, dispose of them by burning (where allowed), burying or hot composting. Removing infected leaves (a potential source of spores of *Rhynchospora*) can help delay the onset and reduce the severity of the disease the following growing season. For additional details on tar spot, check out the University of Wisconsin Garden Facts sheet on this disease at <http://pddc.wisc.edu/woody.html>.

As always, weather plays a big part in the development of plant diseases. If our spring is particularly wet, I would expect to see an increase in diseases of all types. A drier spring will likely mean a slow summer for my staff here at the PDDC. As always, if you are having difficulty in diagnosing a plant disease problem, feel free to submit a sample to the PDDC. Contact and sample submission information is available at <http://pddc.wisc.edu>.

Photo: UW-Madison PDDC

DNR Awards Forty-eight Urban Forestry Grants

by Dana Dentice, Urban Forestry Communication Specialist
DNR Division of Forestry

The DNR Urban Forestry Grant program awarded **\$527,706** to 48 Wisconsin communities, nonprofit organizations and one county for community urban forestry projects. Grant funds for 2012 will support tree inventories and assessments, management plans, emerald ash borer preparedness plans, urban forest restoration projects, staff training, public education and other urban forestry efforts.

Communities were encouraged to apply for grants to bolster their preparedness for emerald ash borer. Wisconsin has approximately 5.2 million ash trees in cities, villages and urban towns. All are at heightened risk since EAB was confirmed in Wisconsin in 2008. The grant awards will help 36 communities conduct a

tree inventory, develop an EAB preparedness plan or increase species diversity, all of which are critical to early EAB readiness planning that includes forecasting budgets for labor, equipment, staff training and restoration.

Urban forestry grants can range from \$1000 to \$25,000 and grant recipients must match each grant dollar for dollar. A Start-up grant of up to \$5,000 is available for communities that want to start or restart an urban forestry program. The DNR awarded 12 Start-up grants this year.

For a printable list of the 2012 grant recipients or more information about the DNR Urban Forestry Grant program go to dnr.wi.gov, keywords “**UF Grant**,” or contact Dick Rideout, *State Urban Forestry Coordinator*, 608-267-0843, Richard.Rideout@wisconsin.gov.

11

2013 Urban Forestry Grant applications are due October 1, 2012.

Visit dnr.wi.gov, keywords “**UF Grant**” in June.

Recipients of 2012 DNR Urban Forestry Grants

City of Altoona: \$2522* Tree planting project	Town of Dunn: \$25,000 Urban forestry project	Movin' Out, Inc. (nonprofit): \$3528 EAB readiness and responsiveness project	City of Pewaukee: \$5000* Green road reconstruction	Schulte PTA (nonprofit): \$1900* Schulte School Learning Naturally
Village of Amherst: \$4437 Tree inventory, management plan, tree nursery restoration and education	Village of East Troy: \$1000* EAB treatment	Village of Necedah: \$2750* Old Mill Park and Necedah School tree planting	Village of Plainfield: \$1000 Reforestation project – tree planting	Village of Spencer: \$5000* Forestry project
City of Ashland: \$11,701 Urban forestry project	City of Fitchburg: \$15,940 Tree canopy analysis, EAB implementation and tree inventory	City of New Berlin: \$4227 Action on EAB response plan	City of Platteville: \$18,333 Implementation of urban forestry management plan and citizen tree replanting day	Sustainable Atwood (nonprofit): \$24,500 EAB readiness and full-cycle response
City of Brodhead: \$5210 Urban EAB program	Village of Grafton: \$25,000 Tree inventory and planting	City of New Holstein: \$1986 Civic Park tree canopy preservation project	Village of Poynette: \$21,648 EAB and urban forestry management	Town of Vernon: \$5000* Tree removal
Village of Brooklyn: \$5000* Tree inventory and public outreach	City of Greenfield: \$25,000 Comprehensive response plan to EAB	City of Oak Creek: \$8175 EAB street tree treatment	City of Racine: \$25,000 Tree inventory	Town of Westport: \$4000 Survey of historical and significant trees
City of Cedarburg: \$21,692 Street tree inventory and tree planting	Village of Johnson Creek: \$14,498 Urban forestry plan update, GIS tree inventory and operations	City of Oconto: \$4000 EAB and invasive species management plan	City of Richland Center: \$19,370 Urban forestry improvements	Village of Wind Point: \$18,927 Urban forestry plan implementation, Phase I
Village of Clinton: \$4812 Forestry project	Village of Little Chute: \$2000 EAB readiness and management plan, ordinance update	City of Onalaska: \$1750 Staff training by consultant	Riveredge Nature Center (nonprofit): \$5368 Westlawn Woods community restoration project	Village of Winneconne: \$17,591 Tree removal, management plan, and GIS training
Community Groundworks (nonprofit): \$25,000 Sustaining urban forest resources through nonprofit collaboration	Village of Marshall: \$4475* Parks 'n' Places tree care program	Oshkosh Area Community Foundation (nonprofit): \$24,700 Planting plan and tree planting	Rotary Gardens, Inc. (nonprofit): \$10,000 Urban forestry awareness and education project for parking lot	City of Wisconsin Dells: \$5143 Street tree inventory and EAB plan
City of Cudahy: \$25,000 Tree removal, management plan and GIS training	City of Merrill: \$4291 Tree replacement and inventory; inventory conversion to GIS	Outagamie County: \$9063 EAB awareness and action planning for the Fox Cities	Village of Rothschild: \$11,028 Inventory and management of invasive species	
Village of DeForest: \$13,641 Ash tree replacement, tree inventory, management plan update, including EAB plan	City of Milwaukee: \$25,000 Radio campaign, door hanger distribution, ash tree injection	City of Park Falls: \$5000* Highway 13 tree planting		
		City of Peshtigo: \$2500 Tree planting		

*Start-up grant

Village of Sturtevant, continued from page 2

the preserve, which is located next to an elementary school. A local tree service cut and removed 32 willow trees. DPW staff cut and chipped 19 smaller trees over several months. Volunteers continued removing invasive trees and shrubs such as buckthorn and honeysuckle, begun several years earlier. Master gardener volunteers applied herbicide to willow tree stumps to discourage re-sprouting.

Removing the hazardous willow trees and invasive plants has opened up the Kirkorian Nature Preserve, allowing sunlight into areas previously covered in shade. This is creating an opportunity for native plants to grow and flourish. It has also improved access for local residents to enjoy leisurely walks through the nature preserve. Another benefit is that the ongoing removal of invasive plants creates a wood source for Sturtevant's annual Halloween bonfire.

The 2011 grant also provided funding for 250 bare-root trees of various species. This purchase included red osier dogwood, serviceberry, American plum, dawn redwood, swamp white oak, hybrid poplar, red oak and black walnut. On April 30, 2011, in celebration of Earth Day, volunteers from the Sturtevant Beautification Committee, Racine/Kenosha master gardeners, UW-Parkside students and community volunteers gathered at Kirkorian Nature Preserve to plant trees purchased from the Racine County Land Conservation Department.

On October 22, 2011, national Make A Difference Day, volunteers gathered to continue maintenance at Kirkorian Nature Preserve (pictured right). Once again, buckthorn and newly sprouting willows were removed. Volunteers reapplied herbicide to the willow

stumps and spread wood chips from the earlier willow tree removal along the numerous walking paths throughout the preserve.

Since 2006, volunteers—master gardeners, local residents, and school groups from UW-Parkside and Shepherd's College—have gathered twice a year on Earth Day and Make a Difference Day to help clean up parks and the Kirkorian Nature Preserve. The master gardeners and volunteers meet periodically throughout the year to construct and prepare a community garden, and perform spring and fall flowerbed cleanup around the village municipal building and in the parks.

This is truly a community-based effort, involving village DPW staff. Though the number of volunteers varies at times, village aesthetics would be substantially hampered without them. The village of Sturtevant works diligently to maintain its parks and green spaces, and is fortunate to have developed a good working relationship with many volunteers. The funding provided by the DNR Urban Forestry Grant program has significantly assisted these efforts. In 2009, the Village of Sturtevant Board of Trustees dedicated a newly constructed detention pond, Volunteer Appreciation Pond, and plans to install a sign in acknowledgement.

The Village of Sturtevant has been very successful in integrating full-time staff, forestry grants and community volunteers into its tree and parks maintenance program without significantly impacting the operational budget of the village. While there are challenges, any community can be just as successful with their own program. 🌿

New Urban Forestry Website!

Come check out our new and improved DNR Urban Forestry website. It's meant to be user friendly and have easy navigation to the resources that most visitors are looking for! Visit us at dnr.wi.gov, keyword "[urban forest](#)."

We would love to hear your feedback on the DNR Urban & Community Forests website. Send any comments or suggestions to [Cynthia Casey-Widstrand@Wisconsin.gov](mailto:Cynthia.Casey-Widstrand@Wisconsin.gov). 🌿



Wisconsin Urban Forestry Council Awards

by Laura Wyatt, Urban Forestry Council Liaison
DNR Division of Forestry

The Wisconsin Urban Forestry Council is pleased to announce recipients of the 2012 Urban Forestry Awards given in recognition of outstanding efforts by individuals, organizations and communities that further urban forestry in Wisconsin. Award recipients were announced at the annual Wisconsin Arborist Association–DNR urban forestry conference in Green Bay. Award plaques and local recognition will be provided in the honorees' home communities.

Lifetime Achievement—Harry Libby

For sustained leadership as Middleton's city forester for 19 years, guiding development of a comprehensive, proactive municipal urban forestry program resulting in increased tree canopy.



Photo: City of Middleton

Retired Middleton City Forester Harry Libby providing instruction to Middleton schoolchildren during an Arbor Day program

Distinguished Service— Dr. R. Chris Williamson

For leadership and service to the urban forestry community through entomology research, education & outreach at UW–Madison, emphasizing invasive insects including emerald ash borer.



Photo: Dana Dentice, WDNR

Dr. R. Chris Williamson (middle), UW–Madison Associate Professor and Entomology Specialist, is presented the Distinguished Service Award at the 2012 WAA/DNR urban forestry conference in Green Bay. Also pictured are Wisconsin Urban Forestry Council members Kelli Tuttle, Chair (left), and Jeffrey Treu (right).

Distinguished Service, Elected Official—Arthur Bushue

For leadership and support guiding the development of Village of Clinton's comprehensive urban forestry program, a model for small Wisconsin communities.



Photo: Janesville Gazette

Art Bushue, Village of Clinton Trustee

Project Partnership—Oconomowoc Junior Woman's Club and the City of Oconomowoc Parks & Forestry Department

Recognizing a sustained tree-planting partnership in Oconomowoc parks that celebrates the birth of babies born to club members. More than 100 trees have been planted since 1982.



In 2011, the Oconomowoc Junior Woman's Club celebrated the planting of the 100th tree donated to the city in honor of babies born to members during the year. Photo: Oconomowoc Focus

Innovations in Urban Forestry—Green Bay Packers' First Downs for Trees

Honoring First Downs for Trees, an innovative approach to offsetting carbon produced during away-game travel by planting trees in Brown County communities for each first down made during the regular season.

For additional information about the Wisconsin Urban Forestry Council and how to submit a project, person or organization for recognition, go to dnr.wi.gov, keywords "[Urban Forestry Council](http://dnr.wi.gov)." 🌿



Photo: WDNR

Green Bay Packers President Mark Murphy (in suit and tie) with partners at the First Downs for Trees kickoff

13

Do you know of a worthy project or individual you can nominate for an award? For information on the nomination process visit <http://dnr.wi.gov/topic/UrbanForests/awards.html>.

The Idea Exchange...

compiled by Olivia Witthun, Urban Forestry Coordinator
DNR East Central Region

14



Does your community or organization have an idea, project or information that may be beneficial to others? Please let your regional urban forestry coordinator know. We will print as many of these as we can.

Tree Tags Benefit Fond du Lac Nonprofit

The City of Fond du Lac does not pick up residents' Christmas trees after the holidays. However, for two days in January, Christmas trees can be picked up curbside by a local nonprofit. Residents can buy tree tags from city hall, the Solutions Center—a nonprofit domestic abuse support organization, or from several area merchants for just \$5 per tag. Solutions Center volunteers pick up and dispose of the tagged Christmas trees residents have left on the curb. Proceeds benefit the Solutions Center of Fond du Lac. The tree tag sale is combined with the option to purchase raffle tickets for various local businesses. Raffle prizes have included a YMCA membership and an auto shop certificate. *Info:* www.solutionsfdl.com/news.html or *Tree Tags, Raffle Tickets for Sale at Solutions Center (Action Sunday, Fond du Lac, 11 Dec. 2011, B3).*

Neighborhood Resource Center Includes Urban Forestry

Ten years ago, Rochester, Minnesota, identified a need to support neighbor groups working on projects to benefit the city's neighborhoods. The community nonprofit RNeighbors was created to promote sustainable neighborhood networks for a vibrant, healthy and livable community. RNeighbors partners with the city's neighborhood associations, offering benefits such as visibility, a centralized communication channel, bulk mail permits, liability insurance for neighborhood association meetings and events, reduced printing and supply costs, crime watch resources, and participation in the Rochesterfest Parade and Rochester's National Night Out. RNeighbors has several programs and projects, but one main focus is RNeighborWoods, empowering and educating community residents to grow a sustainable urban forest. Last spring 450 volunteers planted 1000 trees on city boulevard spaces in a single morning, a new record for them! *Info:* www.rneighbors.org/.

My Tree Is Sick...What Can I Do?

Check out the new DNR Forest Health website! This fabulous information source is loaded with useful and easy-to-find links. Click on the *My Tree Is Sick* picture at this site to find identification, diagnosis, disease and insect information. The main Forest Health page also has links to Wisconsin's more common pests, as well as invasive species information. The *Read* link brings you to annual reports and regional forest health updates. These timely updates describe noteworthy pests present in your area at any particular time. The annual report gives an excellent summary of insect, disease and abiotic issues facing our urban and traditional forests during the preceding year. Be sure to bookmark this website in your Favorites! *Info:* <http://dnr.wi.gov/topic/ForestHealth/>.

Visit dnr.wi.gov, keywords "Forest Health"



Research Notes:

Urban Site Index for Urban Forest Planning

by Alan Siewert and Stephanie Miller
Regional Urban Forestry Coordinators
Ohio Department of Natural Resources

Urban soils range in quality from native profiles to soils that are highly engineered, compacted and nutrient deficient. Delineating various soil types on a large scale for municipal tree planting plans has challenged urban foresters for decades, limiting opportunities for diverse planting designs.

State of Ohio urban foresters have created the Urban Site Index, a systematic method to identify and quantify the quality of planting sites based on eight soil and street characteristics. The USI method results in

a numeric site assessment score (0-20) to help urban foresters place the right tree in the right spot.

A presentation of the USI research is available at www.masslaboratory.org/linked/siewert%26miller.pdf. The presentation covers the background and development of USI, the method for field data collection and several case studies of Ohio communities that used this process. The presentation concludes with suggestions on future research to quantify and monitor the efficacy of USI in urban forest management planning.

Reference: 2011. *Urban Tree Growth: An International Meeting and Research Symposium, Conference Proceedings*. Morton Arboretum, Lisle, IL, pp.27-28. www.masslaboratory.org/linked/utg_proceedings.pdf.

Urban & Community Forestry Program Resources:

Minnesota Forest Pest First Detector Manual

compiled by Cindy Casey, Urban Forestry Coordinator
DNR West Central Region

This manual was produced by the University of Minnesota Extension, Minnesota Department of Agriculture and Minnesota DNR. It is an excellent pictorial guide to serious forest pests of concern in the upper Midwest, including emerald ash borer, gypsy moth, Asian longhorned beetle, thousand cankers disease and sirex woodwasp. The manual is particularly useful for forestry program volunteers and those without extensive forestry training.

View the free manual online at http://issuu.com/mnstsc/docs/forest_pest_manual_feb_2011_opt_1. 🌿



15

Have You Missed an Issue?

We continue to produce *Wisconsin Urban & Community Forests* newsletters in electronic format and publish them on our website. Go to dnr.wi.gov, keyword **UF Newsletter**. Only some issues are printed and mailed. All new issues are announced in the *Wisconsin Urban Forestry Insider*, an electronic news bulletin available at the website above. The Winter 2011-2012 issue of *Wisconsin Urban & Community Forests* (electronic format only) featured the following:

- 🌿 Reflections on the 2011 SMA Conference
- 🌿 Village of Prentice Cooperative Nursery Effort
- 🌿 International Guidelines for Urban Forestry
- 🌿 City of Sparta Community Profile
- 🌿 London Planetree Profile
- 🌿 And More!

What Damaged This Tree?

Answer: The combination of an improper staking system, failure to adjust or remove the staking system in a timely manner and strong winds resulted in the failure of this pine tree. Most newly planted trees do not need to be staked. If staking is necessary, use wide webbing straps. Secure webbing to stakes with heavy-gauge wire but don't surround the tree with the wire, even if inserted through a section of hosing material. Attach materials so the tree can move slightly in the wind. Remove stakes and ties within one year. 🌿



Photo: Mark Drow

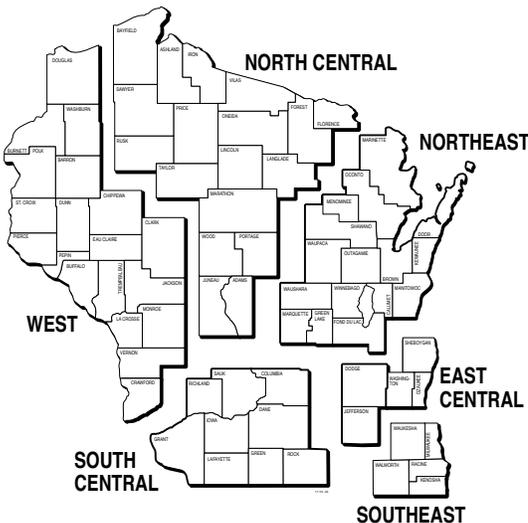


For Breaking Urban Forestry News and Announcements...

Sign up for the *Wisconsin Urban Forestry Insider*, an electronic news bulletin, at

<http://dnr.wi.gov/topic/UrbanForests/newsletters.html>

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