Massachusetts Urban & Community Forestry Program

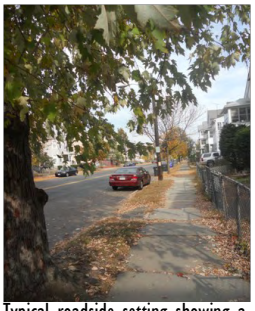
The Citizen Forester

JUNE 2016
NO. 191

A Method for Examining the Ecosystem Services of Roadside Trees: Springfield, Massachusetts

By **Ross Kahn**

Project Background—This article outlines a series of simple, easy-to-implement scientific experiments to examine various roadside types and report on the ecosystem services that these typical roadsides provide. There are four distinct quantitative components included in this study and four roadside types: major arterial roadways, minor arterial roadways with no tree setback, collector streets, and a local residential street setting. The initial investigation was conducted in Springfield, Massachusetts, and the roadside types examined are representative of the roadside types crossing the City. Research and field observation provided information on the structure of the roadsides, including the underground and overhead utilities, drainage systems, greenspace components, and shade tree canopy.



Typical roadside setting showing a minor arterial roadside type in Springfield.

Investigation Process— The first component of this study was to identify the specific tree species associated with each roadside type. A 500-foot segment of random roadside for each type was selected for examination. The City of Springfield Forestry Division provided information on the specific tree species, condition, and size for each roadside section that was utilized in the study.

The second component of the study was to estimate the ecosystem services provided by each roadside type, in order to provide an overview of the benefits that the roadsides of Springfield provide citywide. Four aspects of ecosystem services were examined: air quality – how trees improve the overall air quality in Springfield's neighborhoods, stormwater interception – the amount and degree by which tree canopies intercept rainfall before it reaches the ground, carbon cycling provided by the trees, including capturing and storing carbon emissions before they are released to the atmosphere, and urban heat island mitigation – how trees and other vegetation shade and cool the ground by reducing direct solar receipt on surfaces.

"…ecosystem services are provided by street trees, and that street trees have the capability to furnish both environmental and economic benefits."

i-Tree Design Analysis Tool—Reporting on Ecosystem Services – To generate quantitative data on the ecosystem services provided by street trees, the online software tool i-Tree Design was used in this study. This software tool "allows anyone to make a simple estimation of the benefits provided by individual trees" (United States Forest Service, 2006). i-Tree Design estimated the approximate amount of carbon storage and sequestration, stormwater interception, and air quality improvements based on the specific tree types, sizes, and conditions over a 50-year time period for each of the four road types analyzed. Table 1, below, shows the results of the i-Tree Design analysis completed on these four roadside types in Springfield. State Street (Major Arterial), Union Street (Minor Arterial with no tree setback), Pine Street (Collector), and Cedar Street (Local) were examined. Table 1 indicates the amount of carbon sequestered and gallons of rainfall intercepted by the trees on these streets. Also, using calculations from models developed by the U.S. Forest Service and the U.S. Environmental Protection Agency, an approximate dollar value was established.

(Continued on page 2)

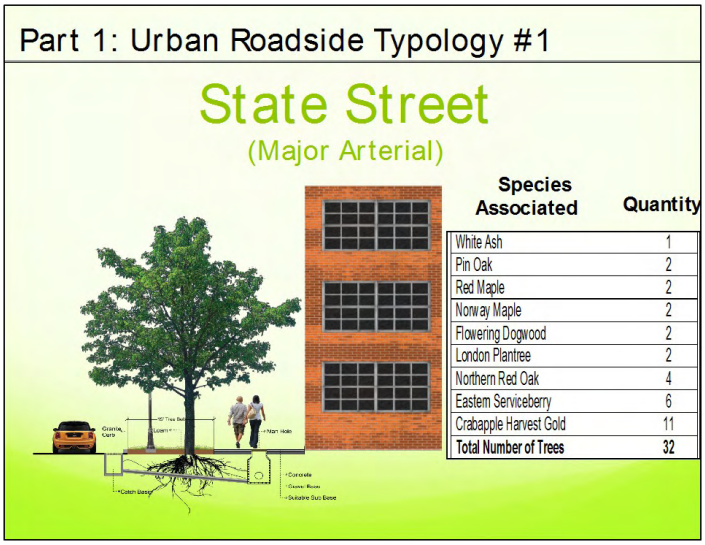
Up Ahead:

Ecosystem Services of Roadside Trees in Springfield (continued)

Time Frame: 2015-2065

	Pounds of Carbon Sequestration	Gallons of Rainfall Interception	Savings in Air Quality Improvements
State Street	217,845	1,576,716	$1,622.00
Union Street	229,857	1,724,691	$1,845.00
Pine Street	232,860	5,232,454	$4,801.00
Cedar Street	255,436	1,360,042	$1,393.00

Table 1: A 50-year projection of ecosystem services of typical roadside types in Springfield, MA as calculated by i-Tree Design.



This diagram shows the current layout of State Street, a major arterial roadside, in Springfield, MA. The table shows the species associated and the quantity of trees within the area analyzed.

Urban Heat Islands –Since urban heat island mitigation is an important ecosystem service that impacts roadside locations, this aspect of tree benefits should be considered in any roadside study, but it cannot be specifically calculated using i-Tree Design. Researchers have studied and quantified the relative impact of trees on urban streetscape settings, examining the difference between temperatures in areas under trees compared with open areas. A review of publications that evaluated the difference between temperatures in areas under trees compared with open areas was undertaken. Although, not specific to the study sites in Springfield, the literature shows that air temperatures of grassy areas under trees located in urban areas can be 1.3 - 2.4° F cooler than in adjacent areas with no tree cover (Souch and Souch, 1993). Similarly, there can be up to a 4 - 6° F difference in air temperature under mature trees in a suburban neighborhood than in newer developments with new or no trees (McGinn et. al, 1982).

Ecosystem Services of Street Trees—The third component of this project was to examine factors that can affect the performance of ecosystem services along roadside networks. Tree belt size and space, occurrence of underground utility infrastructure, surrounding hardscapes, and stormwater infrastructure are four factors that are likely to interfere with the ecosystem performance level that these trees provide.

Limited tree belt size and soil volume is a key and limiting factor affecting a tree's ability to deliver the greatest potential benefit. A tree tends to be healthier when there is a larger tree belt, because with a smaller tree belt the roots are likely constricted with less rooting space for the tree to thrive. "If the tree roots have no more room to grow, branches die, twigs do not grow as long, and the tree produces smaller and/or fewer leaves" (Urban, 2008).

Underground pipes, conduits, and utility lines are other factors that affect the ecosystem services that roadside trees provide. Tree roots may penetrate into sewer and other underground utility lines causing damage to both the tree and the piping because these underground utilities are not always able to withstand the pressure of the growing root system. When pipelines or cable lines are installed and maintained, it may become necessary to cut and/or remove tree roots. This can have a major negative effect on tree health and ecosystem services.

Surrounding hardscape material is a third factor that may affect the ecosystem services provided by trees. The rooting space of trees conflicts with the pavement, causing damage and deterioration. This has the potential to be very costly to repair or maintain. As a result of the damage, trees are removed and may not be replaced. In addition, excavation near trees damages their roots. This process may remove some of the required soil and the transport and use of heavy machinery outside of the paved surfaces compacts the soil, which also affects root growth. This has resulted in decline and loss of street trees within Springfield.

Lastly, stormwater management infrastructure is a major factor that may affect the ecosystem services that trees provide. In Springfield the stormwater runs along the side of the road directly into a catch basin or sewer. The vegetation and trees are most often separated from the stormwater by the roadside curb, so the stormwater falling on the roadside surface rarely gets absorbed by the trees. Trees need this water during the summer months to help supply nutrients and adequate moisture in order to remain healthy (Chuyong, et. al., 2004). "There is evidence that only one drought episode can be detrimental to tree establishment. Restricted water flow through roots can potentially in-

Ecosystem Services of Roadside Trees in Springfield (continued)

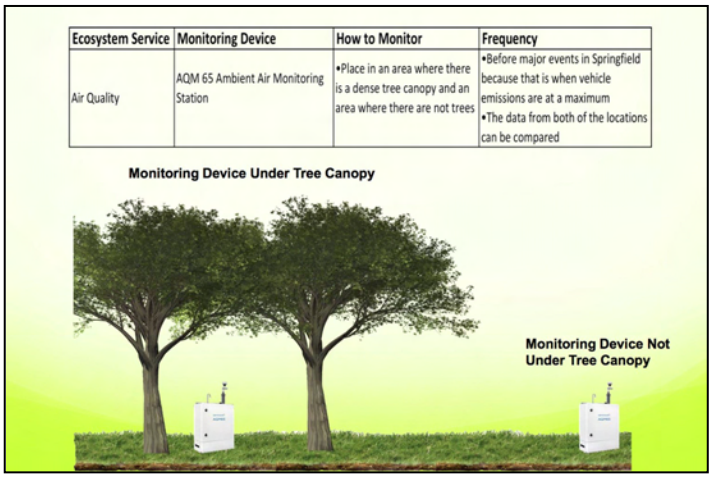


Image 3: Placing an AQM 65 Ambient Air Monitoring Station under a tree canopy and another one in an open area with no trees to compare the different in air quality measurements.

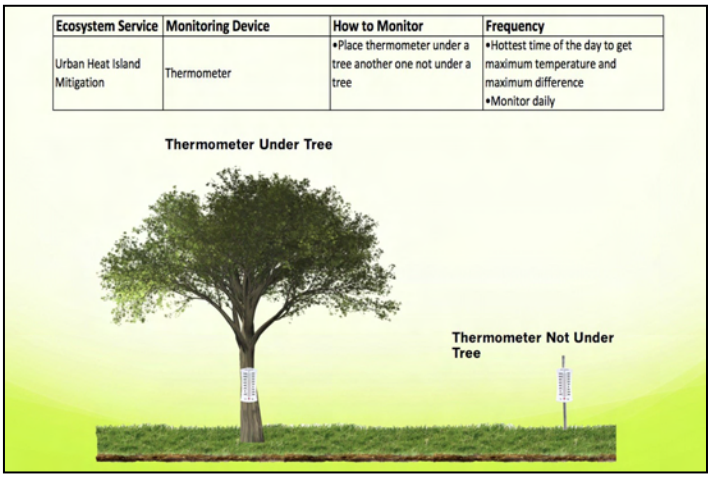
crease dieback" (Watson, 2009). Altogether, this scenario results in decreased nutrients for the trees and increased runoff whereas, if the stormwater were to be intercepted by the trees, it would supply additional nutrients for the trees. Also, the roots enable increased rainfall infiltration through the soil and store water, which reduces the overland flow.

A Framework for Examining Ecosystem Services of Street Trees—The fourth component of this study examines how to monitor the ecosystem service performance that these trees provide. One monitoring method would be used for each of the ecosystem services, as noted: air quality, urban heat island mitigation, stormwater interception, and carbon sequestration.

Air Quality - An AQM 65 Ambient Air Monitoring Station can be used to examine air quality along urban roadsides. In order to properly obtain results, one station must be placed in an area where there is a dense tree canopy and another station in an area where there are no trees. This is because the difference in air quality between these two areas is likely to have the greatest relative difference, thus one could see that the trees have an impact on improving the air quality near these trees, compared with the air quality in areas where there are no trees. In determining the frequency of monitoring the air quality, it is recommended that readings should be taken throughout the year. Also, additional monitoring of major arterial roadways might be considered when major public events take place in Springfield, such as the Big E, concerts, sporting events, and other civic activities where vehicle emissions are likely to be at a maximum. Once the data is collected from each area, the results could be compared to see if there are variations in air quality between the two areas. This will likely demonstrate an improvement in air quality in the tree area as compared to the other.

Urban Heat Island Mitigation - To monitor urban heat island mitigation by street trees, a thermometer is recommended. Similar to setting up the monitoring system for air quality, a thermometer would be placed on the trunk of a tree and another placed on a pole, or tripod, in an open area with no trees. The National Weather Service suggests that in order to get the highest level of accuracy of temperature a thermometer should be place four to six feet above ground and "should be freely exposed to sunshine and wind and not close to or shielded by trees, buildings, or other obstructions" (National Weather Service Instruction, 2014). The best time of day to monitor temperature differences is at the hottest time of the day, which is usually around 2:00 p.m., and in the late overnight period, about 3:00 a.m. In this case, one is likely to get the greatest difference in temperature between the shaded and the non-shaded areas. It is recommended that the air temperatures should be monitored on a daily basis, and averaged on a weekly and monthly basis.

Stormwater Interception - The third ecosystem service that can be monitored is stormwater interception. A rain gauge can be used to measure the quantity of rainfall in a storm



Placing a thermometer under a tree canopy and another one in an open area with no trees to compare the differences in temperatures. How to monitor the temperature and the frequency is discussed in the table above.

event. Similar to monitoring the last two ecosystem services, one rain gauge under a tree canopy and another rain gauge in an open area with no trees. In order to obtain the highest level of temperature accuracy, the National Weather Service suggests a rain gauge "should be "horizontal and located approximately 3 feet above the ground" (National Weather Service Instruction, 2014). In

Ecosystem Services of Roadside Trees in Springfield (continued)

most cases, street trees can reduce the amount urban stormwater since some of the rainfall never reaches the ground; it remains on the leaves of the tree and then evaporates.

The best time to monitor this would be when there is at least one-tenth of an inch of rain forecast to ensure that a measurable level of rainfall from under the tree compared with levels outside of the tree area will be obtained. It is important to monitor weather forecasts to know the amount of expected precipitation anticipated and when the rain event will occur. If one-tenth of an inch is anticipated, then it would be appropriate for the rain gauges to be set up.

When there is a greater rainfall event there often will be less of an interception effect because the leaves on the trees can only intercept so much water. During greater rainfall events, the leaves are not capable of collecting all of the rainwater, and so the tree canopy becomes saturated and unable to hold any more water. If the data on rainfall interception between under a tree canopy and outside the tree canopy is compared over time, it will show whether the trees are providing this type of ecosystem service.

Carbon Sequestration - The fourth ecosystem service that was chosen to monitor was carbon sequestration in the soil surrounding a tree. This can be done using a soil auger. Soil samples are taken directly beside the trunk of a tree at different depths to determine the carbon accumulation in the soil and roots over time. Once the soil samples are taken, they can be analyzed by a scientific laboratory to determine the carbon that is sequestered in the soil near a particular tree (Rowell, 2014). It is recommended that soil samples for any given tree should be taken once a year.

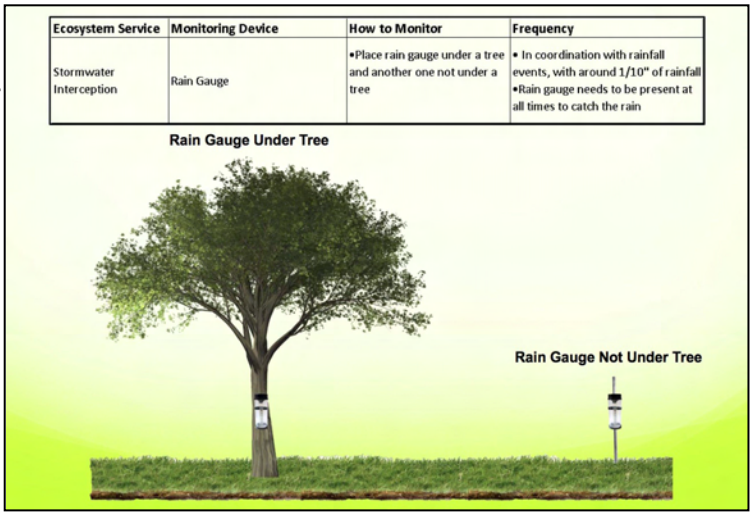


Image 5: Placing a rain gauge under a tree canopy and another one in an open area with no trees to compare the differences in collected rainwater. How to monitor stormwater interception

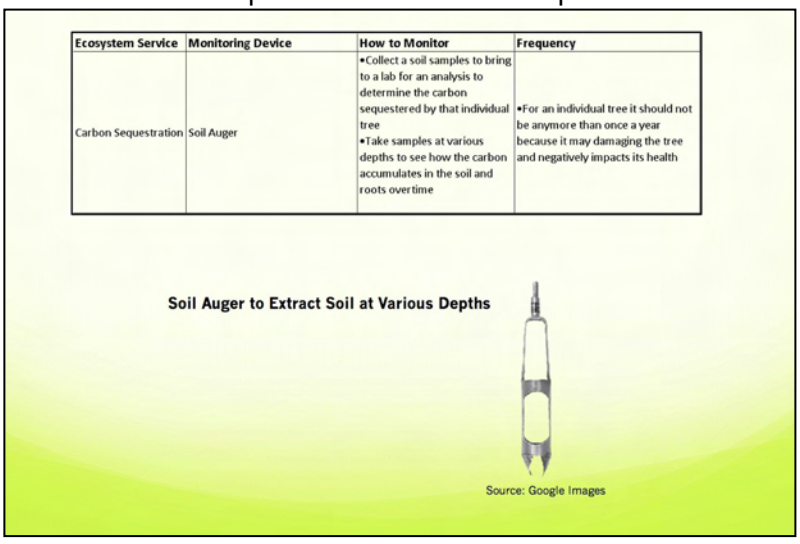


Image 6: A soil auger would be used to collect soil samples around a tree. This sampling will assist in calculating carbon storage and sequestration in the roadside setting and an open area with no trees to compare the differences of collected carbon in the two areas. How to monitor carbon storage and sequestration and the frequency is discussed in the table above.

Conclusion

This field methodology explored several tools that can be used to gauge the level of ecosystem services provided by street trees in a community. The street types examined included a major arterial, a minor arterial with no tree setback, a collector street, and a local street. Based on reviewing research reports, scholarly journals, and using the i-Tree Design tool for quantitative measurements, it is clearly evident that street trees have the capability to provide a substantial amount of benefits to a community.

Flooding, carbon emissions, degraded air quality, and urban heat island effects are critical issues that the built environment is currently facing. Whether these issues continue to worsen or not in the built environment, there is no question that implementing street trees throughout a community will help offset and mitigate these ongoing issues. This initial research demonstrates that multiple ecosystem services are provided by street trees, and that street trees have the capability to furnish both environmental and economic benefits that are guaranteed to improve the overall quality of life.

References:

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Ecosystem Services of Roadside Trees in Springfield (continued)

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Urban, J. (2008). Up by roots: Healthy Soils and Trees in the Built Environment. Champaign, IL: ISA.

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Watson, G. (2009). Landscape below ground II: Proceedings of a Second International Workshop on Tree Root Development in Urban Soils.

Ross Kahn is a graduate of the University of Massachusetts Landscape Architecture program. This article was produced as a senior project.

Ross Kahn just completed his Masters of Regional Planning Degree at the University of Massachusetts Amherst. His research primarily consisted of transportation planning and how planners can accommodate for a more sustainable environment.

Grants

DCR Urban and Community Forestry Challenge Grants

Next deadline: November 1 (Full Application)

Challenge grants are 50-50 matching grants (75-25 for environmental justice projects) to municipalities and nonprofit groups in Massachusetts communities of all sizes for the purpose of building local capacity for excellent urban and community forestry at the local and regional level.

The USDA Forest Service provides funding for the grant program, and DCR administers the grants with guidance from the Massachusetts Tree Wardens' and Foresters' Association. The DCR Urban and Community Forestry Program assists communities and nonprofit groups in their efforts to protect and manage community trees and forest ecosystems, with the ultimate aim of improving the environment and enhancing the livability of all of Massachusetts's communities.

NOTE: The 2016 application contains new guidelines for strategic planting grants.

Starting in 2016, funding for strategic tree planting grants will be tiered:

Grant Funding Request	Eligibility
$1,000 - $7,000	All communities may apply
$7,001 - $20,000	Community must be a Tree City USA
$20,001 - $30,000	Contact DCR Urban and Community Forestry to discuss

Read the complete guidelines and download the news application at: http://www.mass.gov/eea/agencies/dcr/conservation/forestry-and-fire-control/urban-and-community-forestry-challenge-grants.html.

For more information on the Challenge Grants, including our National Grid Partnership Grants and Eversource Go Green grants, contact Julie Coop at 617-626-1468 or julie.coop@state.ma.us or Mollie Freilicher at 413-577-2966 or mollie.freilicher@state.ma.us.

Species Spotlight—European horsechestnut

By **Mollie Freilicher,** DCR

In a previous Species Spotlight, we highlighted a related North American tree, the Ohio buckeye (*Aesculus glabra*), but this month, we will be looking at the European horsechestnut (*A. hippocastanum*). By now, it has probably finished blooming in the Commonwealth, and if you missed it, be on the lookout next year. As its name would suggest, European horsechestnut is native to Europe, and specifically to mountainous areas of the Balkan Peninsula, though at one time, it was thought to be native to Asia. Its journey into the European landscape is fascinating and there is a great review of its discovery and rediscovery in the magazine *Arnoldia*. It was first cultivated in areas of the Ottoman Empire, particularly in Istanbul, where through correspondence, news of it reached Prague in 1557. By 1581, there was at least one in cultivation in Vienna. Following its introduction to Europe, horsechestnut quickly became an integral part of the landscape. Today when we see European horsechestnuts in cities and towns around the world, they are usually large, specimen trees. In the wild, however, they are one of many trees in a mesic woodland and they do not reach such large stature. (For convenience, we'll call European horsechestnut simply "horsechestnut.")

In cultivation, horsechestnut reaches heights of 50 to 70 feet, with a slightly narrower spread. It is hardy in USDA Zones four to seven. Its form is upright, with an oval outline, and it has a medium growth rate.

Horsechestnuts, as the plant identification pneumonic MAD-Cap-Horse would tell us, is one of those plants that has opposite branching. (If you are unfamiliar with the pneumonic device, it stands for Maple, Ash, Dogwood, Caprifoliaciae (honeysuckles), and Horsechestnut and is a device to remember plants with opposite branching.) Horsechestnut is opposite and the leaves are palmate, with seven, sometimes five, leaflets. Leaflets are obovate and four to ten inches long with an acuminate tip. As they emerge, leaves are light green and turn darker green. Fall color is often not great in the U.S., but it is often yellow in Europe.

The buds are reddish-brown, imbricate, large, and resinous. Twigs are stout which gives the tree a somewhat coarse appearance in winter. Leaf scars are somewhat shield or heart-shaped. The bark of horsechestnut is brownish gray and, with age, can become fissured and platy.

When you see the flowers of horsechestnut, it is easy to understand how this tree took Europe by storm. They are perfect, with white petals that have a hint of yellow to red color at the base. They appear in upright panicles. The fruit is a spiny two-inch capsule with one or two black seeds inside. They mature in the fall.

Horsechestnut does best in well-drained soil, full sun to some shade, and can adapt to a variety of pH conditions. Do not plant horsechestnut in areas that are extremely dry. Like its U.S.- native relative, the Ohio buckeye, horsechestnut is very susceptible to leaf bloch, which causes the leaves to discolor and turn brown. Horeschestnut is also susceptible to leaf spot, anthracnose, canker, walnut scale, and many others. Though the insect and disease problems limit its more widespread use, horsechestnut makes a nice specimen tree for large areas, such as parks, campuses, golf courses, and other locations.

Form, flowers: Wikipedia; Leaves: UConn, Bark, Fruit,

Resource

Lack, H. Walter. 2002. The Discovery and Rediscovery of the Horse Chestnut. *Arnoldia,* 61:4.

Growing on Trees

i-Tree 2016 Webinars

Join us for a comprehensive web-based instructional series that will introduce the latest tools in the **i-Tree software suite**, as well as bring you up-to-date on the improvements that have been made to the i-Tree collection of inventory, analysis, and reporting tools for urban and community forests. i-Tree is a state-of-the-art, peer-reviewed software suite from the USDA Forest Service and its partners, which provides urban forestry analysis and benefits assessment tools.

All instructional sessions begin at 1:00 PM (Eastern)
June 15, 2016 - Using i-Tree VUE and STORM
July 20, 2016 - Introducing i-Tree Landscape
August 16, 2016 - What's New in i-Tree ECO
September 20, 2016 - Looking at i-Tree HYDRO
October, 19, 2016 - DESIGN and CANOPY
November 16, 2016 i-Tree STREETS
December 21, 2016 - i-Tree Roundtable: Answering Your Questions About Using i-Tree

CEU Credits: Society of American Foresters CFE units and International Society of Arboriculture (ISA) CEUs are expected to be awarded for attending these online sessions. Each session is planned to last 1 hour.

For more information, go to: http://www.unri.org/itreeworkshops/

Urban Forest Connections

The USDA Forest Service's Urban Forest Connections webinar series brings experts together to discuss the latest science, practice, and policy on urban forestry and the environment. These webinars are open to all. Past webinar presentations and recordings are available here.

Next Webinar:
Wednesday, June 8, 2016, 1:00-2:15 p.m. ET

Urban Green Spaces for Food and Foraging
Marla Emery, USDA Forest Service
Lincoln Smith, Forested LLC

Future Webinars
July 13, 2016, 1:00-2:15 p.m. ET
August 10, 2016, 1:00-2:15 p.m. ET
September 14, 2016 | 1:00pm-2:15pm ET

Go to: www.fs.fed.us/research/urban-webinars/.

Urban Forestry Today

Emerging Approaches to Inventory and Analysis

Thursday, June 9, 2016, 12:00 – 1:00 p.m. ET
Presenters: David V. Bloniarz, Ph.D., US Forest Service and Gabriel Markarian, University of Massachusetts.

Gathering and applying the right analysis tool is essential to commencing our understanding of the benefits of our local urban forests. Join Dr. Dave Bloniarz as he provides an update about the i-Tree suite, including the new i-Tree Landscape, and Gabe Markarian as he outlines some of his recently-published tree inventory analysis research from the University of Massachusetts.

To attend, visit **www.joinwebinar.com** and enter the ID code 117-760-931.

For more information, contact:
Rick Harper, Department of Environmental Conservation, University of Massachusetts, Amherst
rharper@eco.umass.edu

The Urban Forestry Today 2016 Webcast Series is sponsored by the University of Massachusetts Department of Environmental Conservation, in cooperation with the USDA Forest Service, Massachusetts Department of Conservation and Recreation, University of Massachusetts Extension, and Massachusetts Tree Wardens' & Foresters' Association.

From the EPA

New EPA Climate Change Training Module - "Understanding Climate Change Impacts on Water Resources"

This online training is intended to increase water resource professionals' understanding of the causes of climate change, its potential impacts on water resources, and the challenges that water resource professionals face. The module describes how federal, state, tribal, and local governments and communities are working to make the United States more resilient to the impacts of climate. The 45-minute training is part of the EPA Watershed Academy web certificate program.
Learn More and Take the Training.

More information at: **www.epa.gov/watershedacademy**.

Growing on Trees

Growing Greener—In Monson

The Replanting Monson Tree Committee was recently awarded a DCR Urban and Community Challenge Grant for $5,300 to plant trees in Veterans Field, an area decimated by the 2011 tornado. Since being restored after the tornado, the field is becoming more community oriented, with senior fitness equipment, basketball court, skate park, and playground. Trees will help shade the senior fitness course and the playground. The grant will also plant trees around Memorial Hall.

Interested in applying for a DCR Urban and Community Forestry Challenge Grant? Check out information on our website or contact Julie Coop, julie.coop@state.ma.us or 617-626-1468 or Mollie Freilicher mollie.freilicher@state.ma.us or 413-577-2966. The next application deadline is November 1, 2016.

From the New England Chapter- International Society of Arboriculture

ISA Exam Prep Course

This three-day course instructs on the sixteen components of the ISA Arborists' Certification Study Guide. The goal of the course is to prepare participants to take the ISA Certified Arborist exam.

When: Wednesday, October 19, 2016, 7:45 AM - Friday, October 21, 2016 4:30 PM ET
Where: Acton, MA
Instructor: Mark Duntemann
Registration: $175
Contact: Heather Leff, NEC-ISA, 978-844-0441 or heather@newenglandisa.org

Advanced Tree Risk Assessment

This comprehensive, two-day workshop covers Level 3 Advanced Tree Risk Assessments and is separated into two distinct components. The first day focuses on classroom activities covering risk theory and methods of non-invasive site and tree assessment and diagnosis. The second day is field based in the use of a range of invasive diagnostic tools. Earn 15 ISA CEUs, including BCMA!

When: Thursday-Friday, August 18-19, 2016
Where: Hanover, NH
Instructor: Mark Duntemann
Registration: $250
Contact: Heather Leff, NEC-ISA, 978-844-0441 or heather@newenglandisa.org

Gleanings

How Massachusetts Seeded the Idea of Land Conservation

The Trustees of Reservations, turning 125 this year, helped spark a worldwide movement to set aside public lands. Check out this short piece that begins in the year 1891, about the history of the Trustees of Reservations (including mention of the early days of what is now the Department of Conservation and Recreation). The full story is at bostonglobe.com.

City Parks, Clean Water: Making Great Places Using Green Infrastructure

Check out this report from the Trust for Public Land that examines new and existing parks through a stormwater lens. Read the report here: www.tpl.org/city-parks-clean-water.

U. of Miami Study Links Neighborhood Greenness to Reduction in Chronic Diseases

A new study of a quarter-million Miami-Dade County Medicare beneficiaries showed that higher levels of neighborhood greenness, including trees, grass and other vegetation, were linked to a significant reduction in the rate of chronic illnesses, particularly in low-to-middle income neighborhoods. Led by researchers at the University of Miami Department of Public Health Sciences at the Miller School of Medicine, and the School of Architecture, the study showed that higher greenness was linked to significantly lower rates of diabetes, hypertension and high cholesterol, as well as fewer chronic health conditions. Read more at eurekalert.org. *Thank you to Mary Ann Wordell of the Fall River Street Tree Planting Program for pass-*

Gleanings

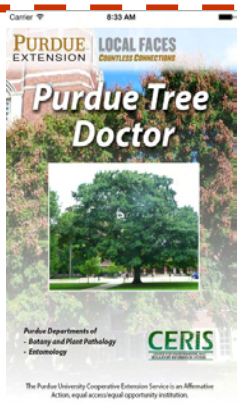
Ground Rules: Soil Health in the Urban Landscape

By Chuck Sherzi, Jr.

Ralph Waldo Emerson once said, "Nature never hurries…." The same, I might add, holds true for the soil.

April 8, 2016— Since I can remember, I have always been fascinated by soil. It was an interest that motivated me to study plant and soil science at the University of Massachusetts and later on to pursue a career in the green industry as a horticulturist and arborist. When I write on the topic of soil, I do so neither as a soil scientist, nor as an extension professional but as a seasoned field practitioner, workshop instructor, and observer. Although my green industry resources have provided me with a wealth of soil information over the years, I have found myself seeking and being guided more by the advice of local farmers and foresters regarding their soil philosophy, knowledge, and practices. Read the full story at www.ecolandscaping.org.

Purdue Tree Doctor App

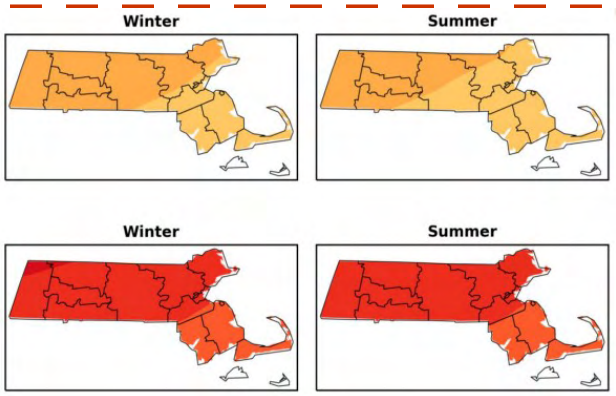


The Purdue Tree Doctor app has been developed by experts at Purdue University to help people better identify and manage tree problems caused by a variety of factors, including insects and diseases. Landscape professionals, arborists, and garden center personnel can use this app to improve communication with their customers. Information in this app is useful in the Midwestern and Eastern United States.

Features: Identify tree problems by matching damaged plant parts to over 1000 high-resolution photos. * Check diagnoses with detailed descriptions of damage and stages of problem development linked to each photo * Get the latest unbiased recommendations from Purdue University experts on how to manage over 175 tree problems on over 60 kinds of trees. * Search information by tree or by pest.

Available at the Apple App Store and Google Play Store. For more information, go to https://purdueplantdoctor.com/.
First seen in *TCI Magazine*

State-level Climate Projections



April 20, 2016—Northeast Climate Science Center Principal Investigator, Ray Bradley, with NE CSC Postdoctoral Fellow Ambarish Karmalkar have created individualized reports for 22 states of the Northeast and Midwest of climate projections and impacts. Ray, Ambarish and colleagues from UMass Amherst's Climate System Research Center (CSRC), including intern Kathryn Woods, released these easily referenced and illustrative reports to coincide with the Earth Day signing of the COP21 climate agreements by world's leaders, making the climate change projections relevant at the state level. Read more and see the individualized projections: https://necsc.umass.edu/news/state-level-climate-projections.

From *TCI Magazine*

Enter the fascinating world of plant galls in the April issue of *TCI Magazine.* Read about what we know, and what we don't, in this in-depth article. Check it out here.

Also in this issue, "New Rules for Working Around Electricity," details updates to federal OSHA rules concerning tree work around electrical lines. Read more here.

And in the June issue, read an article by Clarisse Hart, of Petersham, on wood banks, "Spreading the Warmth: Firewood Donations an Investment in Community." Read more here.

Find out more at: www.tcia.org.

Gleanings

Another Reason to Love Urban Green Space: It Fights Crime

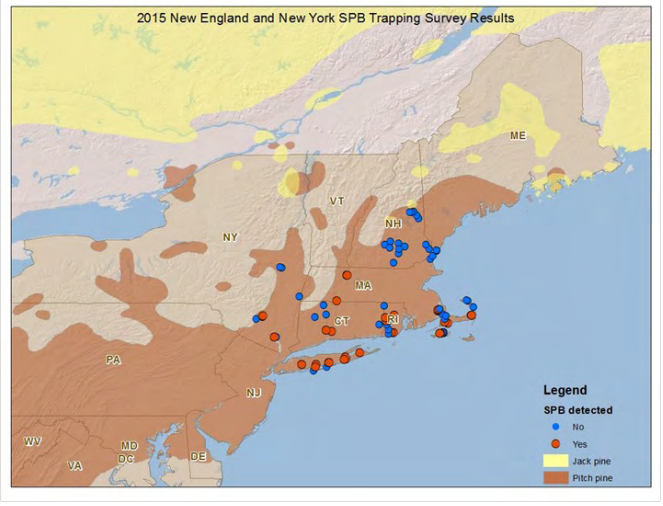
A new body of evidence suggests that adding greenery in vacant or gray settings reduces criminal activity nearby. There are plenty of reasons to like green spaces in cities: they're pretty, they catch stormwater runoff, they improve health. And now a new body of evidence is coming into focus on how urban nature affects crime. It appears that the way we take care of our trees, shrubs, and lawns makes a difference for the safety of the surrounding area. Read the full story at CityLab.

From UMass Extension

Tick Awareness: Don't let one bite change your life

The Blacklegged Tick, also called Deer Tick, is abundant and active throughout Massachusetts. They can carry the organisms that cause Lyme disease, Babesiosis, and Anaplasmosis. All three diseases are on the rise. While tick-borne illnesses can be very serious if untreated, **they are preventable**. Larry Dapsis, Deer Tick Project Coordinator and Entomologist for Cape Cod Cooperative Extension offers these useful tips.

Show more →



Southern Pine Beetle

What to look for

https://ag.umass.edu/fact-sheets/southern-pine-beetle

Local Governments Are Paying the Price for Global Trade's Effects on Trees

The emerald ash borer hitched a ride overseas on wooden shipping crates. Now it's eating into municipal budgets. April 25, 2016— When a tree dies in a forest, it eventually falls to earth, disputably makes a sound, and inevitably decomposes to become fodder for future generations. When a tree dies in a city street, a private yard, or a public park, it becomes a lethal threat to people and property. City governments and property owners end up paying to safely dispose of the trunk, and the benefits that tree provided to its neighborhood are lost. In American cities from the Atlantic to the Midwest, this loss is all too real—and urgent. Local governments are digging deep into emergency funds to cut down ash trees that are plagued by a little green bug: the emerald ash borer. Read the full story at CityLab.

NASA Satellite Images Uncover Underground Forest Fungi

March 31, 2016—A NASA-led team of scientists has developed the first-ever method for detecting the presence of different types of underground forest fungi from space, information that may help researchers predict how climate change will alter forest habitats. Hidden beneath every forest is a network of fungi living in mutually beneficial relationships with the trees. Called mycorrhizal fungi, these organisms spread underground for miles, scavenging for nutrients that they trade with trees for sugars the trees make during photosynthesis. "Nearly all tree species associate with only one of two types of mycorrhizal fungi," explained coauthor Richard Phillips of Indiana University, Bloomington. Read the full story at nasa.gov.

News Headlines in Brief

- Connecticut tree cutting notification bill advances
- Looking At Trees Can Reduce Your Stress Levels, Even In The Middle Of a City
- 'Be A Smart Ash' Campaign Designed To Protect Trees
- Sudden Oak Death Has Killed a Million Trees in California and Scientists Say It's Unstoppable
- Imported Forest Pests Cause $2 Billion in Damage Annually

News

Walpole Town Forest Celebrates 100th Anniversary

By Rachel Borman

One thousand white pine saplings were planted in the Walpole Town Forest on Sunday, May 1, in honor of the forest's 100th Anniversary. The first tree was put down by Lieutenant Governor Karyn Polito. This was reminiscent of the original 1916 ceremony, where the initial tree was planted by one of Polito's most famous predecessors – Lieutenant Governor Calvin Coolidge who went on to serve as the 30th U.S. President. "I have the opportunity to travel all of the Commonwealth now," said Lieutenant Governor Polito. "We have a beautiful state, but there are not a lot of municipal forests, town forests that are named after your community. This is something special." Read the full story at hometownweekly.net.

State Looking to Plant 2,400 Trees in Pittsfield

April 22, 2016—Pittsfield— The state is looking to plant some 800 trees per year in the city of Pittsfield over the next three years. Pittsfield was chosen as part of the Greening the Gateway Cities program through which the state's Department of Conservation and Recreation plants trees in urban environments. The program targets the 26 so-called Gateway Cities and will plant the trees in areas where there are currently low canopy levels.

"The Greening the Gateway Cities Program serves as an excellent example of a strong partnership between state government, local municipalities, and dedicated organizations working together to ultimately benefit generations of people," said Gov. Charlie Baker in a statement on Wednesday.

Locally, DCR is looking to plant a total of 2,400 trees over the next three years in neighborhoods bordering the downtown, a total of 1,000 acres.

"The Greening the Gateways Cities project is a perfect example of how the commonwealth partners with cities, and I'm thrilled to see Pittsfield be part of this year's award," said state Rep. Tricia Farley-Bouvier. "Planting trees in the Westside and Morningside Neighborhoods brings beauty, improves quality of life, cools our city and helps absorb carbon, making it a win all around." Read the full story at iberkshires.com.

Emerald Ash Borer in Wilbraham

On May 5, 2016, officials from the United States Department of Agriculture confirmed the presence of emerald ash borer (EAB) in Wilbraham, the first detection in Hampden County. A private arborist saw exit holes and extensive "blonding" of bark on several ash trees on a private property near Bruuer Pond and contacted state officials. Staff from the Department of Conservation and Recreation Forest Health Program found evidence of EAB on the property and sent samples to the USDA for confirmation. Several ash trees in the vicinity of the property were also found to be infested, as well as ash trees near the library and Crane Park. DCR is working with the town to place additional traps in the area and is also working with the USDA and the town for the potential release of biocontrol agents, *Tetrastichus planipennisi* and/or *Oobius agrili*. The entire state of Massachusetts remains quarantined for EAB and residents are reminded that it is a best practice to buy and burn firewood locally to avoid spreading EAB and other insects. For additional information on EAB and ash trees, see the DCR factsheet: Recommendations for Handling Ash.

Pupils Help Launch Tree Planting Program in Leominster

By David Dore

On a day designated to celebrate trees, local and state officials gathered at Frances Drake Elementary School to mark the beginning of a three-year effort to plant hundreds of trees in Leominster.

The ceremony and tree planting featuring Frances Drake pupils on Arbor Day, April 29, celebrated the recent expansion of the state's Greening the Gateway Cities Program to eight cities, including Leominster. Peter Church, director of forest stewardship at the state Department of Conservation and Recreation, said the program is "designed to reduce household energy use and associated costs by increasing the tree canopy cover in urban residential areas." And with DCR planting crews consisting of local residents, he said, the program also "provides local employment and skill building to help empower residents and communities." Read the full story at the *Leominster Champion*.

On the Horizon

June 2	Identifying Freshwater Wetlands in the Landscape Training 2: Identifying Inland Wetland Soils, UMass Extension, UMass-Amherst
June 2	Massachusetts Smart Growth Conference, Worcester, http://www.masmartgrowthconference.org/
June 7	Western Mass Tree Wardens meeting, Northampton www.masstreewardens.org
June 8	Urban Forest Connections Webinar, Urban Green Spaces for Food and Foraging, http://www.fs.fed.us/research/urban-webinars/
June 9	Weed Walkabout, UMass Extension, Walpole
June 9	Urban Forestry Today Webcast, www.joinwebinar.com; code: 114-760-931
June 15	**SAVE THE DATE- Tree City/Line/Campus USA Forum and Awards Ceremony**
June 15	i-Tree webinar series, Using i-Tree VUE and STORM, http://www.unri.org/itreeworkshops/
Jul 13	Urban Forest Connections webinar, http://www.fs.fed.us/research/urban-webinars/
Jul 22	Plant Health Care Workshop, Tree Care Industry Association, www.tcia.org/training
Aug 18-19	Advanced Tree Risk Assessment , Level 3, New England Chapter-ISA, Hanover, NH, www.newenglandisa.org
Sept 21	Saluting Branches, http://www.salutingbranches.org/
Oct 14-15	**SAVE THE DATE! 2016 Tree Steward Training, Petersham, MA**
Oct 19-21	Certified Arborist Prep Course, New England Chapter-ISA, Acton www.newenglandisa.org
Nov 6-8	New England Chapter-ISA 50th Annual Conference, Burlington, VT, www.newenglandisa.org
Nov 10-12	TCI Expo Tradeshow and Conference, www.tica.org
Nov 16-17	Partners in Community Forestry Conference, Indianapolis, https://www.arborday.org/programs/pcf/
Nov 30-Dec 2	New England Grows, Boston, www.newenglandgrows.org
Nov 30-Dec 3	American Society of Consulting Arborists Annual Conference, Boston, http://www.asca-consultants.org/

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If you have a topic you'd like to see covered or want to submit an item to *The Citizen Forester* (article, photo, event listing, etc.), please contact Mollie Freilicher or click here.

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