



THE CITIZEN FORESTER

Urban & Community Forestry Program

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The Perks and Price of Planting Street Trees

By Tierney Bocsi and Rick Harper

Officially declared by Congress as America’s National Tree in 2004, the oak boasts a long history of cultural significance. This stately tee has served as a landmark throughout the centuries and is recognized to this day for its size, stature,

abundance, and diversity. With nearly 60 different species native to the United States alone, oaks are the most widespread hardwoods in North America. It makes sense then, given their common presence in our rural forests, that many species of oak are popular street trees. In addition to the lumber products and wildlife benefits they provide, oaks are hardy shade trees that, in some instances, may offer brilliant fall color.

Oaks, like other street trees, can also deliver a suite of ecosystem services in the urban forest. These include, but are not limited to, carbon sequestration, stormwater mitigation, air quality improvement, and energy savings. The services mentioned here are unique in that the U.S. Forest Service has developed a way to quantify them in terms of their dollar value, furthering our knowledge about the economic benefits to planting trees, especially in urban areas. Using tools from the [i-Tree software suite](#), we can generate analyses about the current and projected benefits, in U.S. dollars, of our street trees.

For example, if we enter the necessary information required for one of the i-Tree tools, called MyTree (<https://mytree.itreetools.org>), we can evaluate the savings generated by a northern red oak growing next to a building. Here is a table summarizing the inputs required for MyTree and the outputs produced from the analysis at right.

Input Categories and User Data Provided		Ecosystem Service and MyTree Output	
Tree species	<i>Quercus rubra</i>	Total benefits for	\$59.39
Tree condition	Good	CO ₂ sequestered	\$1.86
		<i>Carbon absorbed</i>	104.91 lbs.
Trunk measurement	29” DBH	Stormwater	\$35.23
		<i>Rainfall intercepted</i>	4,404 gal.
Sun exposure	Partial sun	Air pollution removed	\$2.38
		<i>Ozone and other</i>	42.21 oz.
Year building built	1950-1980	Energy usage	\$19.92
Distance to building	39-59 ft.	<i>Electricity savings</i>	66.29 kWh
Direction to building	East	<i>Fuel savings</i>	6.40 therms

This red oak, situated in partial sun approximately 40 feet east of a building built in 1966, is in good condition and currently measures 29 inches in diameter at 4.5 feet from the ground. Based on these metrics, the tree generates nearly \$60 each year in ecosystem services. We can expect that, as it grows larger, these benefits will increase over time, and there are other tools, such as i-Tree Design, that allow us to project future savings.

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The Perks and Price of Planting Street Trees

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Though urban trees provide these services, they also require investments. From tree planting to maintenance and replacement, street trees take time and money to ensure their success, particularly in harsh urban

environments. It is of interest to researchers and forestry professionals alike to determine at what point the benefits outweigh the costs of our urban forests. To get at this, we can ask ourselves, where is the breakeven point? In other words, at what point in age, size, etc. do trees pay back in ecosystem services what it has cost to purchase, plant, and maintain or replace them? Researchers at UMass Amherst are looking at just that.

Data collected from a case study of 48 specimen oak street trees planted in Amherst, MA is being used in combination with mortality data from long-term studies to perform a cost-benefit analysis, which seeks to identify the breakeven point for trees in the urban landscape. The analysis will implement i-Tree software to project economic benefits over the lifespan of the trees in the case study. Then, those benefits will be compared to the costs to purchase, plant, and maintain the trees over time, accounting for mortality and replacement. In comparing savings from ecosystem services to the cost of investment for these street trees, researchers will be able to detect the breakeven point, where the benefits of planting street trees surpasses the investment in them. This information becomes even more pertinent when making the case (or not) for planting street trees in the face of factors like insects, disease, and climate change, which impact urban forest planning and management.



Mature oaks in the landscape

Circling back to our mighty oak, we see how complicated planting decisions can become. While we know that oaks make great shade trees – and now, we can verify their economic benefits – there are still reasons to scrutinize where and when planting more oak species is appropriate in our urban forests. For one, oaks are messy. They drop acorns and attract all sorts of wildlife, which homeowners and city goers may not necessarily appreciate, and there is even more to consider from a management perspective. Oaks are popular street trees, and diversity recommendations might discourage their planting in areas where they are already abundant. Furthermore, with pressure from insects and disease, namely recent, local outbreaks of gypsy moth in the Northeast, as well as oak wilt, and potential shifts in hardiness zones due to climate change, the future of oak species as suitable street trees may alter, and urban forest managers must be prepared to adjust accordingly.

Worry not, however, for the mighty oak is hardy, adaptable, and, when planted in the right place, can serve a community by providing all the ecological and economic benefits of a timeless and beloved tree.



Attractive fall leaf color of scarlet oak (*Quercus coccinea*)

Tierney Bocsi is a graduate student at UMass-Amherst, pursuing an M.S. in Environmental

Conservation. **Rick Harper** is an Extension Associate Professor in the Department of Environmental Conservation at UMass-Amherst.

This work is supported by the USDA National Institute of Food and Agriculture – McIntire Stennis Project # 34, Accession #1014171.

Species Spotlight—red pine, *Pinus resinosa*

By Mollie Freilicher



Form, [Virginia Tech](#)

Red pine is native to the United States. It is even native to the Northeast and to north-central Massachusetts, though it was never found in as great numbers here as it was in other, more northerly parts of its range. Its native range is a bit disjunct, with a patch in northern Pennsylvania and southern New York, a patch in eastern West Virginia, and one in Newfoundland. It also has a continuous stretch from north-

central Massachusetts to New Brunswick and parts of Quebec, west to southeastern Manitoba and Minnesota, but not dipping south of Michigan much. Red pine is a tall tree, reaching heights of 80 to 90 feet, with a straight bole and a rounded crown. In Massachusetts, red pine was a popular tree for reservoir managers to plant plantation-style around reservoirs, such as the Quabbin and other locally-managed reservoirs. With their fast growth, red pines



Fruit, [Virginia Tech](#)



Bark, [Virginia Tech](#)

provided a quick means of filtering water on its way into reservoirs. At the time, red pines were also fairly free of pests and diseases. Where they are native, red pine grows in well-drained soils, often in sand plains.

Red pine is evergreen and has two needles per fascicle. They are slender and dark green and snap cleanly when bent, which can help aid identification.

Red pine twigs are orange-brown in color, with orange ovoid buds. The bark is also distinctive and is reddish-brown to gray, becoming flaky and platey as the tree matures.

Red pine is monoecious, with male and female flowers growing on the same tree. Occurring in clusters at the tips of branches, male flowers are round and light red. Female flowers are a round, reddish-brown cone. The fruit is a shiny brown cone, 1.5 to 2.5 inches long and kind of egg-shaped. Scales are keeled and are not prickly.



Flower, [Virginia Tech](#)

You may recall a few years ago hearing a lot about red pine in the news, or perhaps you noticed that red pines at your local reservoir or forest were not looking so good. A red pine scale, which had been discovered in New England in 1946 and which has since been found from New York to Maine, was identified as the culprit, and decimated trees across New England. Infested and dead trees were, and are being, removed, and areas are being replanted with trees other than red pines.



Leaf, [Virginia Tech](#)

Aside from the tree's historic use in watersheds, wood from red pine has been used for construction, as well as millwork and pulp. With its serious pine scale problem, we do not recommend planting red pine. There are lots of other evergreens to consider for urban and suburban sites – white fir (*Abies concolor*), eastern white pine (*Pinus strobus*), or Serbian spruce (*Picea omorika*) are just a few. To check out what can happen when plantation red pines are removed from a pine barren, check out [this story about Myles Standish State Forest](#).

References

Dirr, M.A. 1997. *Dirr's Hardy Trees and Shrubs: An Illustrated Encyclopedia*. Portland, OR: Timber Press.

Miner, Bradford L. Scale Emerges as Threat to Pines. August 21, 2011. *Worcester Telegram*.

[Red pine](#). Virginia Tech Dendrology.



Twig, [Virginia Tech](#)

Growing on Trees

Fifth-grade classes from public and private schools across the Commonwealth are encouraged to participate in the annual Arbor Day Poster Contest by having fifth-grade students create posters highlighting this year's theme, **Trees Have Mass Appeal**, and then hosting a school poster contest. The winning poster from each school can be submitted to DCR. Home-schooled or non-participating school students may submit their posters and enter the contest individually.

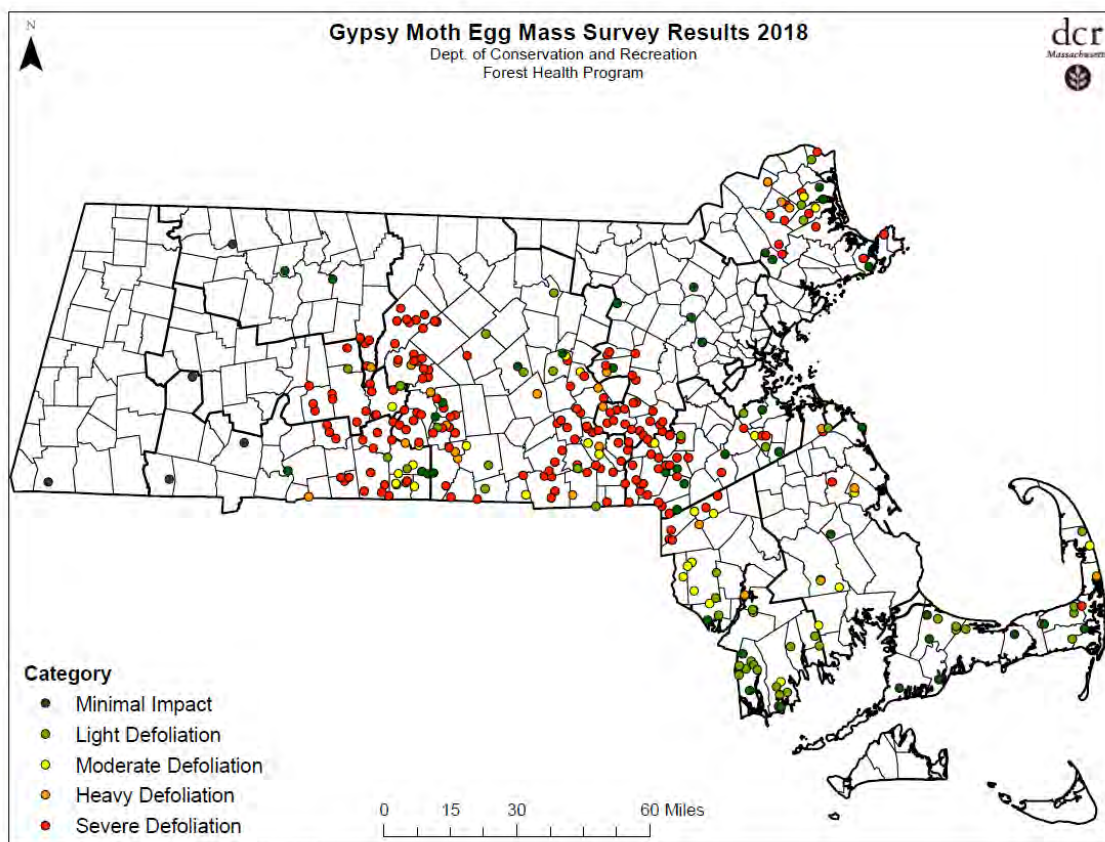
For complete rules and guidelines, go to the [Arbor Day Poster Contest page](#) on the DCR website.

The Arbor Day Poster Contest is sponsored by the Department of Conservation and Recreation, the U.S. Forest Service, and the Massachusetts Tree Wardens' and Foresters' Association.



Gypsy Moth Egg Mass Survey

DCR Forest Health staff have completed a survey counting gypsy moth egg masses. Results show that some areas may be in for severe defoliation in 2019. Due to the strong influence of natural conditions and controls, it is difficult to predict gypsy moth impact on a local level, but the egg mass survey gives a rough idea of potential damage we might expect for parts of the state in 2019.



Map Created by N Keleher, DCR Forest Health 12/20/2018

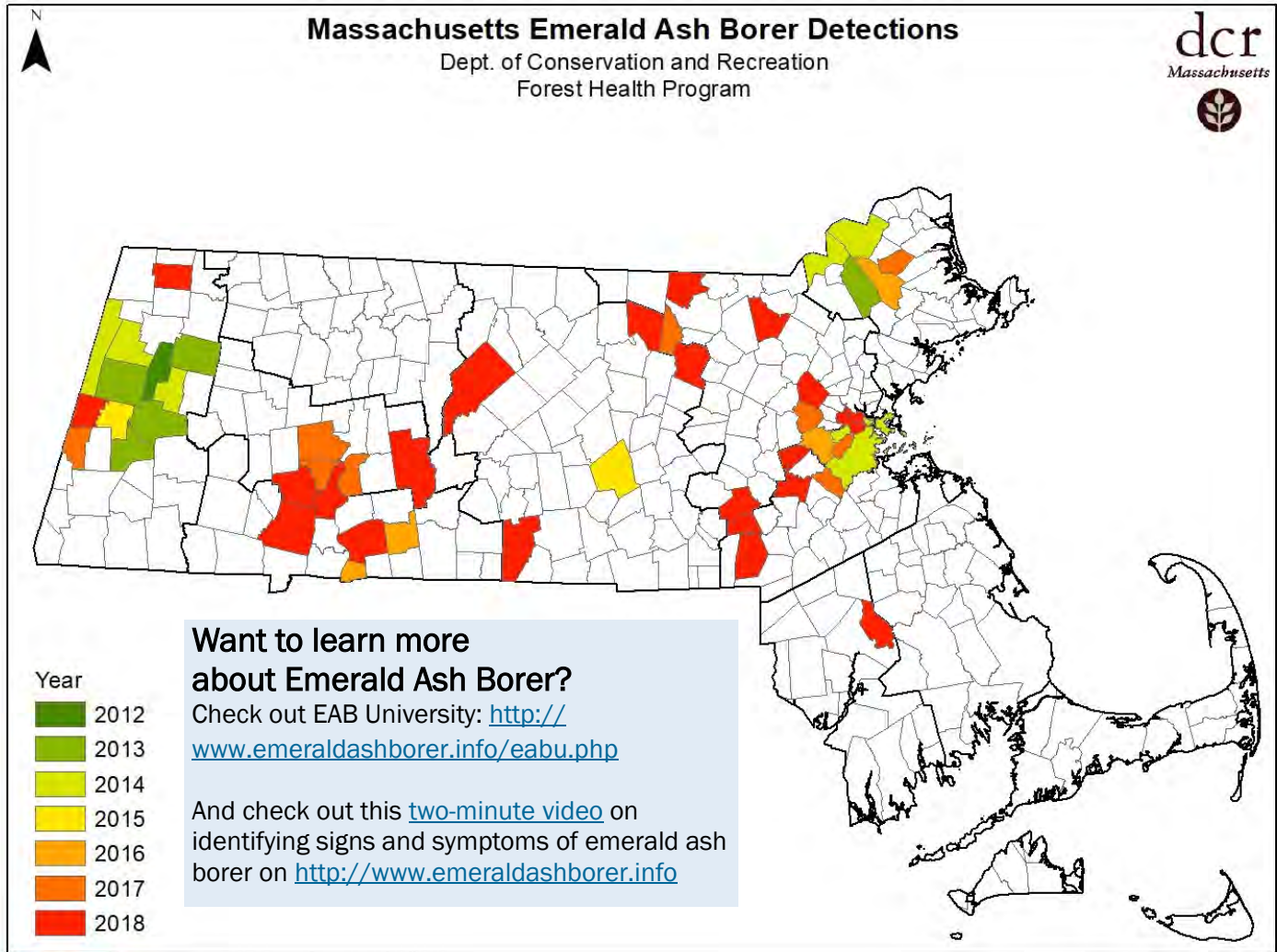
To find out more, go to the [Gypsy Moth in Massachusetts guide](#) on the mass.gov website.

Growing on Trees

Emerald Ash Borer Update

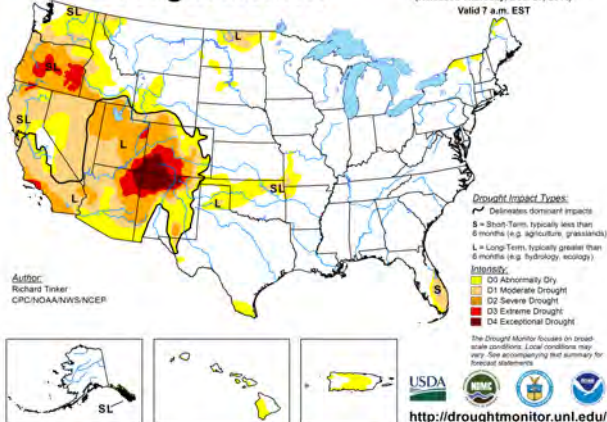


Currently, EAB can be found in 46 communities throughout the Commonwealth, as well as in all five other New England states. Learn how to identify the insect and damage at the [UMass Extension](http://umassextension.edu)



U.S. Drought Monitor

December 25, 2018
(Released Thursday, Dec. 27, 2018)
Valid 7 a.m. EST



Drought Monitor

With the recent rains, as of December 25, no parts of Massachusetts were classified as abnormally dry or in drought.

For the latest drought information, go to <https://droughtmonitor.unl.edu>.

Growing on Trees—Webcasts and Events

Urban Forestry Today Webcast

Managing Emerald Ash Borer

January 3, 2019 | 12:00 – 1:00 p.m. (Eastern)

Phillip Lewis, Ph.D., USDA-APHIS

To attend live and receive free CEUs, go to: www.joinwebinar.com and enter the ID code: 252-290-115.

Archived webcasts are available at www.urbanforestrytoday.org under 'Videos.'

This broadcast is free and will offer the opportunity for arborists to earn 1.0 ISA CEU and 0.5 MCA credit.

The Urban Forestry Today 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.

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](#).

More Than Good Looks: How Trees Influence Urban Stormwater Management in Green Infrastructure Practices

January 9, 2019 | 1:00 – 2:15 p.m. (Eastern)

Andrew Tirpak, University of Tennessee
Lyn Rutherford, City of Chattanooga, TN

Upcoming Urban Forest Connections Webinars

February 13, 2019 | 1:00 p.m.-2:15 p.m. (Eastern)

April 10, 2019 | 1:00 p.m.-2:15 p.m. (Eastern)

Upcoming Courses

We highlighted some upcoming courses in our November issue. [Check them out on page 7.](#)

TREE Fund Webinar

The Salt Dilemma: Growing Better Urban Trees in Northern Climates

February 5, 2019, 2:00 p.m. (Eastern)

James Urban, FASLA (Urban Tree & Soil)
Andrew Millward, PhD (Ryerson University)
Adam Nicklin (PUBLIC WORK)

More information is at www.treefund.org/webinars

Upcoming TREE Fund Webinars:

February 13, 2019 | 1:00pm-2:15pm (Eastern)

April 10, 2019 | 1:00pm-2:15pm (Eastern)

May 8, 2019 | 1:00pm-2:15pm (Eastern)

More information is at www.treefund.org/webinars

Massachusetts Tree Wardens' and Foresters' Association 106th Annual Conference

January 8-9, 2019 | Sturbridge

Registration is open for the MTWFA annual conference. Sign up for education-packed days, connecting with colleagues and vendors, and continuing education credits.

To view the full program and to download a registration form, see the [2019 Conference Brochure](#). [Online registration](#) is also now available. www.masstreewardens.org

25th Annual ELA Conference & Eco-Marketplace

March 6-7, 2019 | UMass Amherst

Forests and natural systems are under enormous pressure from the effects of climate change, insect damage, invasive plants, and rapid urbanization. What can you do to protect these systems? Join us to learn more how to restore lost ecological connections, better manage urban land, and create beautiful, highly functioning landscapes!

Find out more at the Ecological Landscape Alliance website: www.ecolandscaping.org/.

Growing on Trees

From UMass Extension Spotted Lanternfly Preparedness Conference



February 7, 2019 - 8:30 a.m. – 3:30 p.m. | Milford

The spotted lanternfly (*Lycorma delicatula*) was first detected in the United States in Pennsylvania in 2014. This non-native, invasive insect has since had a large impact on agricultural and ornamental crops and on the quality of life of many Pennsylvania residents. While this insect is associated with the invasive tree of heaven (*Ailanthus altissima*), it has been reported from 70+ species of host plants, including apple, plum, peach, grape, and many native and ornamental trees and shrubs. This insect is unfortunately on the move, having been detected in additional states, including Delaware, New York, Virginia, New Jersey, Connecticut, and Maryland.

What can we do in Massachusetts to prepare for this insect? Knowledge is power. This conference will provide the latest research and information about the identification, life cycle, impact, monitoring, and Integrated Pest Management options that are known for this insect. Landscapers, arborists, tree wardens, foresters, nursery operators, lawn care professionals, grounds managers, and tree fruit and small fruit growers are encouraged to attend. Join UMass Extension in learning more about the spotted lanternfly!

CREDITS: 6 pesticide contact hours for categories 25, 27, 29, 35, 36, and Applicators License. Association credits: ISA, MCA, MCH, MCLP and AOLCP credit requested. Find out more at the [Center for Agriculture, Food, and the Environment website](http://www.centerforagriculture.org).

Ticks and Tick-Associated Diseases Conference

April 24, 2019, 8:30 a.m. – 3:30 p.m. | Milford

Landscapers, arborists, tree wardens, lawn care professionals, grounds managers, and essentially any professionals working outdoors run the risk of encountering, being bitten by, and contracting a tick-associated disease from multiple tick species in Massachusetts. This conference brings together speakers who will discuss what is currently known about tick and tick-associated diseases in Massachusetts and surrounding states, habitat and winter survival of ticks, personal protection, and the management of ticks in landscapes.

CREDITS: Five pesticide contact hours for categories 29, 35, 36, 37, and Applicators License and three pesticide contact hours for category 40. Association credits: ISA, MCA, MCH, MCLP and AOLCP credit requested.

Find out more at the [Center for Agriculture, Food, and the Environment website](http://www.centerforagriculture.org).

Become a Certified Arborist in Massachusetts in 2019

International Society of Arboriculture
ISA Certified Arborist
February 6—Springfield
March 2—Wellesley
March 26—Pittsfield
April 13—Amherst

www.newenglandisa.org/certification



Massachusetts Arborist Association
Massachusetts Certified Arborist
April 5—Wellesley
October—Wellesley

www.massarbor.org/Certification



THE CITIZEN FORESTER

Growing Greener—in Plainfield

Forming last summer, the Plainfield Tree Alliance works to preserve mature trees, to replant trees that are removed, and to ensure that wood from public shade trees that are removed is put to good use in this hilltown at the northwestern edge of Hampshire County. Already, the group, which meets monthly, has conducted a windshield survey, applied for a DCR Urban and Community Forestry Challenge Grant for a wood bank, and galvanized support in town for trees, ([and gotten press!](#)). They have also organized a series of tree talks this winter that are free and open to the public. See below and check out what the Plainfield Tree Alliance is all about.

Sponsored by the Plainfield Tree Alliance

Tree Talks

All events at
Town Hall
Main Street,
Plainfield, MA.

No. 1.
Sunday, January 13, 2019, 2:30-4:30 pm
Trees and Plainfield's Town Center
Walt Cudnohufsky, founder of the
Conway School of Landscape Design
2:30 pm, walkabout with Walt.
Meet at Town Hall.
3:45 pm, coffee, tea, cider and chat
with Walt.


No. 2.
Thursday, January 17, 2019, 6-7:30 pm
**Minding and Maintaining Street Trees:
The Community's Role**
A Conversation with Four Tree Wardens
Winton Pitcoff, Plainfield, Ben Brown,
Worthington, Bob Goss, Goshen,
and Chris Ryan, South Hadley.
Potluck supper, 6 pm. (Bring a dish.)
Conversation, 6:30-7:30 pm

FREE AND OPEN TO ALL

No. 3.
Thursday,
February 28, 2019, 7-8:15 p.m.
**Climate Change, Extreme
Weather, Pests, Disease, and
Street Tree Maintenance /
The Role of Volunteers**
Rick Harper,
UMass Dept. of
Environmental Conservation

No. 4.
Thursday,
March 14, 2019, 7-8:15 pm
**Street Trees:
Threats and Solutions**
David Bloniarz,
U.S. Forest Service

No. 5.
Thursday,
April 25, 7-8:15 pm
**New Salem's Street Tree Plan
and Visioning Process /
Options for Street Trees**
Mollie Freilicher,
Mass. DCR



**PLAINFIELD
TREE ALLIANCE**
Preserving, replanting
and maintaining
our community trees.

Questions or to join our
mailing list, write David Perkins
at davidsp Perkins@gmail.com.

Gleanings

Northeast Silviculture Institute Training Materials Now Available Online

Ten days' worth of materials from the Northeast Silviculture Institute for Foresters training sessions is now available online for anyone, not just foresters. Every lecture and field stop in 2017 was filmed. The dozens of resulting videos and backing materials are now available for viewing in the comfort of your own home or office. [Check out the list of courses available.](#)

News

The 'Most Ambitious' Species Restoration Project In The World

By Josh Swartz

December 28, 2018— On a dirt road in a remote area of Western Massachusetts, forester Larry Bruffee recalls a memorable day from 2010 when he was working on installing a power line.

"So I came out to survey the clearing of the trees on this side of the road. And that's when I found this one here," Bruffee says as he gestures towards a normal-looking tree.

To Bruffee, though, it was anything but normal. He had found a mature American chestnut tree, a species known to be practically extinct since the first half of the 20th century due to a catastrophic blight. These days, most trees of its kind die before they ever get half as big as the one Bruffee found.

This tree could be part of the key to unlocking the future of this species, so Bruffee is one of the few people who knows its specific location. He prefers to keep it secret for fear of potential visitors looking for a souvenir.

You wouldn't know it from looking up at the tree from the side of the road, but the American chestnut is at the center of one of the most nutty stories of near extinction and resurrection ever heard in the United States. It involves genetic engineering, warring factions of tree enthusiasts, and a mysterious, destructive force that was first discovered at the Bronx Zoo.

Read or listen to the full story on WBUR.org.



The American chestnut tree in Western Massachusetts that forester Larry Bruffee discovered.

News Headlines in Brief

[Space Laser to Map Trees in 3D](#)

[Why Extreme Rains Are Gaining Strength As the Climate Warms](#)

[Missing the Forest for the Trees: An Unexpected Picture of New York City Forests](#)

[Climate Change, Winter Warming Harming Forests in the Northeast](#)

[Rare and Diverse Giant Viruses Unexpectedly Found in a Forest Soil Ecosystem](#)

[Toronto Using Fungus to Battle the Emerald Ash Borer Beetle](#)

[A 'Vertical Forest' in Toronto](#)

[Puritan Tiger Beetles, 'Vicious Predators,' May Soon Hunt Again](#)

[52 Million Tree Stories More Accessible to Science](#)

[Researchers Reverse Engineer Way Pine Trees Produce Green Chemicals Worth Billions](#)

[Insect Infestations and Hot, Dry Summers Have Killed Trees Covering Nearly 50,000 Forest Acres in Rhode Island](#)

[New Algorithm Provides a More Detailed Look at Urban Heat Islands](#)

On the Horizon

- Jan 3** Urban Forestry Today Webcast, 12:00 pm, (Eastern), www.urbanforestrytoday.org
- Jan 8-9** Mass. Tree Wardens and Foresters Association Annual Conference, Sturbridge, www.masstreewardens.org
- Jan 9** Urban Forest Connections Webinar, 1:00 pm (Eastern), www.fs.fed.us/research/urban-webinars/
- Jan 18-19** Mass. Municipal Association Annual Conference and Tradeshow, Boston, www.mma.org
- Feb 5** TREE Fund Webinar, 2:00 pm (Eastern), www.treefund.org/webinars
- Feb 6** ISA Exam, Springfield, www.newengland.isa.org (snow date: February 12)
- Feb 7** Spotted Lanternfly Preparedness Conference, UMass Extension, Milford, www.umassgreeninfo.org
- Feb 24 -** Municipal Forestry Institute, Society of
- Mar 1** Municipal Arborists, Silverton, OR, www.urban-forestry.com
- Feb 27-29** New England Society of American Foresters Winter Meeting, Burlington, VT, www.nesaf.org
- Mar 2** MACC Annual Conference, www.maccweb.org
- Mar 2** ISA Exam, Wellesley, www.newenglandisa.org
- Mar 23** Massachusetts Land Conservation Conference, Worcester, <http://massland.org/conference>
- Mar 26** ISA Exam, Pittsfield, www.newenglandisa.org (snow date: March 28)
- Apr 13** ISA Exam, Amherst, www.newenglandisa.org
- Apr 26** Arbor Day in Massachusetts

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Bureau of Forestry

Department of Conservation and Recreation

251 Causeway Street, Suite 600
Boston, MA 02114

Julie Coop, Urban and Community Forester
julie.coop@mass.gov | (617) 626-1468

Mollie Freilicher, Community Action Forester
mollie.freilicher@mass.gov, | (413) 577-2966

www.mass.gov/dcr/urban-and-community-forestry

Charles D. Baker, Governor

Karyn E. Polito, Lieutenant Governor

Matthew A. Beaton, Secretary, Executive Office of Energy and Environmental Affairs

Leo Roy, Commissioner, Department of Conservation and Recreation

Peter Church, Director of Forest Stewardship, Department of Conservation and Recreation

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.), contact [Mollie Freilicher](mailto:Mollie.Freilicher) or click [here](#).

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