Massachusetts Department of Conservation and Recreation

THE CITIZEN FORESTER

Urban & Community Forestry Program

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What is a Tree Inventory?

By **Mollie Freilicher**

A tree inventory is a record of location and characteristics of individual trees and, sometimes, characteristics of their environs, within a defined geographic area. For municipalities, tree inventories typically include street trees and trees in parks or other municipally-owned properties. Campuses and institutional grounds managers may also conduct tree inventories for their properties. Conducting a tree inventory is the first step in developing a comprehensive urban forest management program. When a community has a tree inventory, it can begin planning for the future and move away from a reactionary tree management program.

Tree inventory, Arlington. In 2017 volunteers inventoried trees along streets, in parks and cemeteries, and along the bike trail.

Why Conduct a Tree Inventory?

- Communicate the importance of a strong municipal forestry program.
- Develop management and policy recommendations.
- Understand the distribution of species in the urban forest.
- Determine the overall condition of trees.
- Identify vacant tree planting sites.
- Quantify the dollar value and benefits of the urban forest.
- Use it as the foundation for a management plan.

There are three main types of inventories: complete, partial, and sample.

A **complete inventory** includes all street trees, sometimes all park trees and trees on municipal properties, and often includes available planting locations and stumps.

A **partial inventory** is conducted on a specific non-random area. It may be a ***geographic*** area, such as a downtown. It may be a ***phased*** inventory where different areas are collected at different times, with the goal of each phase eventually comprising a complete inventory. A ***survey*** collects a few attributes over a large area, even the entire municipality. Surveys are often conducted by vehicle.

A **sample inventory** is conducted on a random sample of street segments, blocks, road miles, or area to provide an estimate for the urban forest. Typically, the sample is 3-10%. The sample can also be stratified.

Partial and complete inventories are often linked with work-order management systems. These may be integrated with a work-order management system the municipality uses for other infrastructure.

Up Ahead:

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What is a Tree Inventory?

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Any of these types of inventories may be updated on a periodic or a continuous basis. To be most effective, an inventory should be linked to a geographic information system (GIS) and be updated regularly. Inventories range in cost from a few thousand dollars to upwards of $40,000. The DCR Urban and Community Forestry Challenge Grant is available to help fund tree inventories. DCR grants up to $30,000 for urban forestry projects, including tree inventories. Major drivers of cost include the number of trees inventoried and the number of attributes collected. The attributes should tie to the goals for the inventory. At a minimum, attributes should include, tree location, species, size, and condition, but others may be useful as well, including tree risk rating, pests, maintenance needs, or site conditions.

What Kind of Inventory?

The type you choose should be appropriate to your community's:

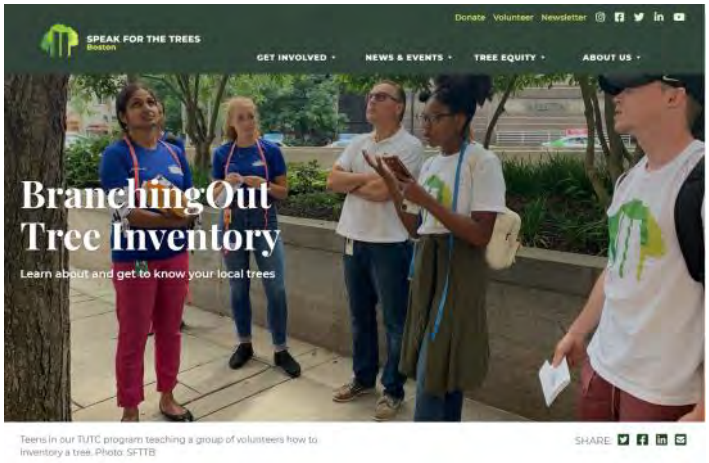
GOALS: What are the reasons and expected outcomes for conducting a tree inventory? What do you want to be able to *do* once you have an inventory?

RESOURCES: What monetary and staff resources are available to accomplish and utilize the inventory?

DATA MANAGEMENT: How will your community manage the data once collected?

A complete inventory is ideal for those communities that have:

- An existing street tree inventory in need of updating
- Tree maintenance staff who want to become more efficient and develop an inventory-based management program
- An in-house GIS system
- Staff available to manage the data as trees are planted, maintained, or removed



Volunteers and participants from Teen Urban Tree Corps, a program of Speak for the Trees, Boston, have inventoried street trees in several parts of Boston. The City is currently wrapping up a complete tree inventory as part of the development of an Urban Forest Plan.

A complete inventory can help:

- Improve work-scheduling and cyclical maintenance
- Improve the ability to respond to storm damage and estimate costs
- Enhance efficiency when responding to constituent requests
- Locate all trees of a single species; for example, to aid in planning for and responding to a pest or disease outbreak, like emerald ash borer

A partial tree inventory can do all the things listed above, but on a limited geographic basis.

A tree survey can help:

- Establish a foundation for a more detailed inventory
- Seek grant funds for developing a more comprehensive program
- Create a system for tree risk management, especially helpful for rural and suburban communities (when the survey is a limited visual tree risk assessment)
- Determine the number of potential tree planting sites throughout the community

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What is a Tree Inventory?

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A sample tree inventory is most appropriate for communities that:

- Seek to build support and investment from their local government
- Need to develop an advocacy network for community trees
- Have staff / student / tree committee / volunteer time to conduct the inventory
- Are willing to develop strategies in response to the results

Combining Types of Inventories

If you need to get the big picture for your whole community, but have particular goals for a specific area, you can combine inventory types. For example, you may want a limited visual tree risk assessment (a type of partial tree inventory) for the whole community so you can implement a tree risk management program. You could also conduct a geographically limited inventory of the business district to help improve the management of trees in that area.

A Note on Qualifications

Trained volunteers can successfully conduct tree inventories, but for inventories that include tree risk assessment, we recommend using a qualified arborist. In addition to possessing an arborist certification, a qualified arborist should hold the Tree Risk Assessment Qualification from the International Society of Arboriculture.

What if my community already has a tree inventory?

Tree inventories are most effective when they inform an urban forest management plan and are used in day-to-day or week-to-week management of trees. A management plan is a vision for the future urban forest that outlines planting, maintenance, and removal goals in a multi-year planning horizon. The Urban Forest Management Plan Toolkit website defines a management plan as

> "a roadmap that creates a shared **vision** for the future of a tree canopy. It's a tailored plan that guides tree care professionals to proactively and effectively manage and provide for maximum, long-term benefits to the community. The plan provides recommendations based on the analysis of detailed inventories and includes additional components or documents, such as budgets, implementation schedules, policy and procedure manuals, standards and specifications, public education and monitoring plans, and existing ordinances."

If your community has a tree inventory from a couple years ago and does not have a management plan, consider working toward one. A management plan may be written in-house or a community can work with a consultant. Plans will vary depending on the size and setting of the community. A plan for a rural town will be different than a plan for a highly-urbanized city. A rural community may also be able to develop a plan based on a survey, whereas a city would be better served by a complete inventory to inform the plan as well as day-to-day-management.

Check out the Urban Forest Management Plan Toolkit website or the Urban Forestry Toolkit on Vibrant Cities Lab.

Not sure where to start? Start with a conversation with the DCR Urban and Community Forestry Program and learn about the financial and technical assistance available.

Species Spotlight

Flowering Dogwood—*Cornus florida*

By **Mollie Freilicher**

Flowering dogwood is one of the native stars of our forest understory, known for its showy white display in late spring. First things first, though. Is the genus really *Cornus*? There has been a long-standing global botanical debate about the taxonomy of dogwoods. In recent years, many plants in the genus *Cornus* have been placed in other genera or subgenera (*Benthamidia, Swida, Chamaepericlymenum*, *Cornus,* and more) based on a better understanding of plant relationships. *Benthamidia* is where our flowering dogwood has most recently landed, along with other species that also have inconspicuous flowers with showy bracts that look like petals and red fruit, like Kousa dogwood (*Cornus kousa*). For now, we will stick with using *Cornus* for all dogwoods, which is still acceptable and widely used. Your botanist friends (or maybe you!) may snicker, but try finding *Benthamidia florida* at the local tree nursery. That being said, if you do encounter, *Benthamidia florida*, know that that is the same as your trusty old friend *Cornus florida*.

Form (Virginia Tech)

Flowering dogwood is a small tree, sometimes a shrub, often with a flat-topped crown. At maturity, it is often as wide or wider than it is tall. Flowering dogwood typically reaches heights of 20 feet, but can grow larger. The current national champion, in Sampson, NC, is 33 feet tall with a 40-foot spread. It is native from Florida to Maine, and west to Michigan and southern Ontario, to southeastern Kansas, and eastern Oklahoma and Texas. It is hardy in USDA hardiness zones five to nine. Where it grows naturally, it can be found in the understory of mesic forests, in floodplains, slopes, and in ravines and is an important source of food for caterpillars. It also can be found in oldfields and along fencerows.

Flowers and bracts (Mollie Freilicher)

Like most other dogwoods, flowering dogwood has opposite branching, with a simple oval to ovate leaf that comes to a tip and has smooth margins. The leaf itself is also smooth and medium to dark green in color. Leaves are three to six inches long and about half as wide, with six or seven pairs of veins. In fall, the leaves turn red to purple.

Bark (Mollie Freilicher)

Twigs may start out purplish and somewhat downy, but eventually they turn gray and scaly. The bark of flowering dogwood is distinctive and is a good cue for winter identification. The bark has a blocky appearance, with the bark

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Species Spotlight- Flowering Dogwood—*Cornus florida*

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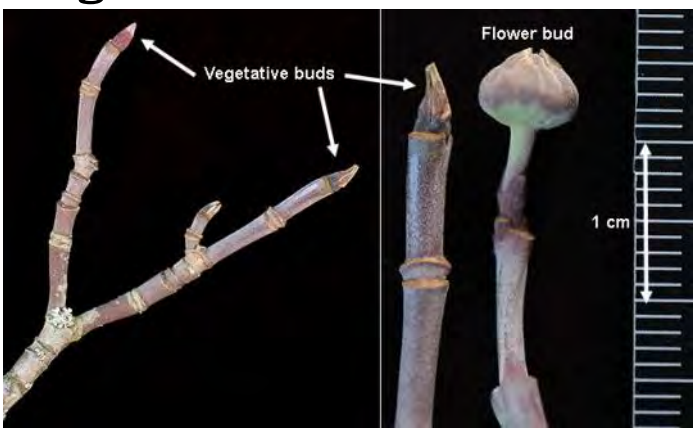

Twigs, with vegetative and flower buds (Oregon State University)

'breaking' into small squares. The overall effect is often described as an "alligator hide." (Common persimmon has similar bark.) The flower bud is distinct, at the end of the stem, and shaped somewhat like a head of garlic or an onion, with two outer scales and two inner scales. These scales will eventually become the showy white bracts. The vegetative buds are smaller, valvate and pointy. Stems initially are red-purple, but turn gray and scaly as they age. Many may be surprised that the flowers are small and yellow-green, not big and white. The white "flower" we commonly think of when we think of flowering dogwood are bracts, essentially modified leaves, that look like petals. The flowers are grouped in the center. Flowering dogwood blooms in May before the leaves emerge and last for about two weeks. The fruit is a small, glossy red drupe, about a half-inch long that ripens in early fall and is typically in a group of three or more fruits. Over 40 species of birds, and many mammals, eat the fruits, which are high in calcium and fats. Flower buds and foliage are also consumed. Nutrient content and palatability can vary by site and other factors.

In the planted landscape, flowering dogwood does best in sites with acid, well-drained soil, and part shade, though it can also grow in full sun. Flowering dogwood has its share of insect and disease challenges, including borers, leaf spots, cankers, and anthracnose. Anthracnose, caused by a *Discula* species of fungus, can kill forested and landscape trees. Anthracnose is more common in years with cool, wet spring and fall seasons. A tree's ability to handle the infection is affected by cultural care practices, including mulching, proper watering during dry periods, and improved air circulation around the tree. Trees that are stressed may be predisposed to infection, as well as to attack by borers. There are fungicides available that can be used to supplement cultural practice controls.

As a wide tree that prefers moist sites, flowering dogwood is not a good choice for the streetscape, but would be better suited to parks and natural areas, away from stresses like heat and road salt. Flowering dogwood makes a great native addition to your community's planting palette.

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Brazee, N.J. 2019. Dogwood Anthracnose, UMass Extension.

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Tirmenstein, D. A. 1991. Cornus florida. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Available: https://www.fs.fed.us/database/feis/plants/shrub/corflo/all.html

Mollie Freilicher is Community Action Forester with the Massachusetts Department of Conservation and Recreation Urban and Community Forestry Program.

From the Woods

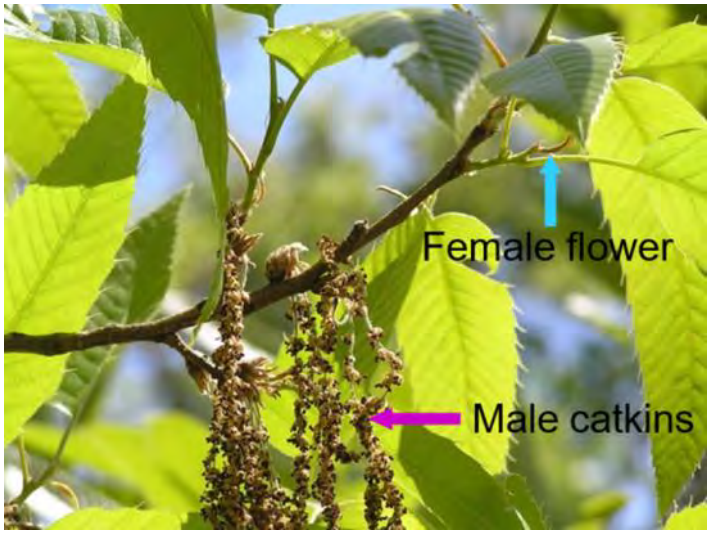
Acorn Production

By **Andrew Rawcliffe**

The following article has been adapted from town hall presentations done in collaboration with several other organizations as part of a grant from the U.S. Forest Service. The purpose of the grant is to educate landowners about oak trees (genus Quercus*) after growing concerns from the public due to oak mortality from gypsy moth. This small part that follows is part of a larger picture where forest health issues are covered as well as general oak silvics, behavior, growth habits, and general knowledge of the oak genus. During these town hall meetings, a panel of experts presents information and land owners are also invited to share their concerns about their local forests. This program is still ongoing and has gone virtual due to COVID-19 restricting in person meetings. This collaboration is a multi-state effort, as we have also partnered with bordering states of Rhode Island and Connecticut. Over the next year we will work more closely with our partners in Rhode Island and Connecticut to further our outreach efforts across the region.*

Spring is well underway and gardens are beginning to turn green and pick-up trucks everywhere are driving around with big tanks in the back, making stops in weird spots along roads to collect the sap from sugar maple trees. While gardens, sugar maples, and spring peepers are garnering most of the attention to herald the new season, the giants in the woods have yet to awaken from their dormancy over winter. These giants are our oak trees and the next several weeks are going to be very important in deciding the amount of acorns that we'll see in the fall. The first step in acorn production for the oak trees is flowering.

Oak trees (genus *Quercus*) are considered monoecious (mono=one and ecious=house) meaning that they produce both male and female flowers on the same tree (in "one house"). Most oak species will begin flowering between fifteen to twenty-five years of age, some even take as long as forty years before they begin flowering! The male "catkin" will produce the pollen and the female flower is what will create the acorn for the fall time. Pollen is wind dispersed over a two-to-three-day period and the pollen needs low humidity and low wind speeds to disperse the best. Although individually the oak will pollinate over a two-to-three-day period, the pollen season for oaks as a group will last weeks. Once the female flower has been pollinated it will wait until approximately mid-summer for acorn enlargement and embryo development. So, if flower crops are largely regular then why don't we have regular acorn crops every year?



Female and male flowers on oak. (Kurt Gottschalk, USDA Forest Service)

This is a difficult question to answer. It is hard to measure an acorn crop of one year and measure the environmental effects of the previous year because the environmental effects may have been very different and affected the acorn crop in different ways. The prevailing answer right now to the connection between flowering and fruiting is the number of female flowers and their percent survival. In one study, this explained 90% of the variation in acorn crops of black oak, northern red oak, and white oak in Missouri. Losses of the flower crop can be due to environmental factors. Higher humidity during

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Acorn Production

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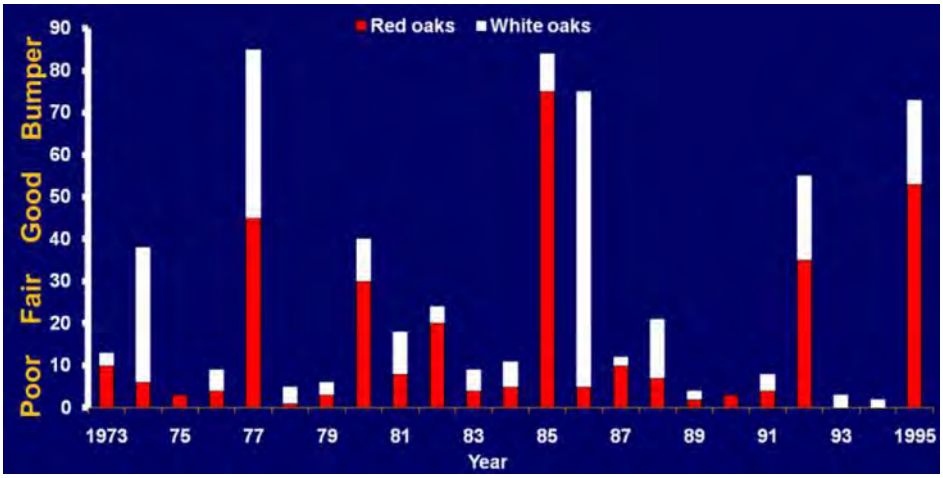
the spring will prevent pollen from dispersing well, especially if the wind is blowing too hard, effectively blowing the pollen so it does not settle into the female flower. Late-season frosts may kill or damage flowers and drought conditions will force the tree to conserve energy and not produce as many flowers. Biotic factors that can reduce a flower crop can include the genetic make-up (phenotype) of the tree, as some oaks are barren and cannot produce flowers. Insects and other predators with a high population during the flowering season will feed on the flowers. If any of these factors stress an oak tree enough, then the tree will abort its acorns to conserve energy for surviving the stressors. Oaks will generally abort their acorns in early July through August. These acorns will have started to develop, but the oak will starve the acorn of resources, so the acorn will be a tiny fraction in size of what it would normally be. Acorn production has large year-to-year and tree-to-tree variability and this is typical. **Research points to this being an evolutionary adaptation to overcome seed predation, with several contributing environmental factors.** There are two groups of oaks that encompass the genus *Quercus*. These are the red oak group and the white oak group. (Erythrobalanus is the formal name for the red oak group and Leucobalanus is the formal name for the white oak group). The white oak group shows high periodicity in acorn production, with crops occurring every other year and good crops one out of four years. The red oak group has less consistent periodicity in acorn production. One study in Wisconsin over a twenty-one-year period showed that bumper crops occurred one out of seven years and good crops occurred one out of three years. The difference between a “good” crop and a “bumper” crop is simply the amount of acorns produced by the specific trees measured by the dry weight of the total acorn crop. Both red and white oaks produce crops from “poor” to “bumper” but bumper crops for white oaks are more infrequent than they are in red oaks. Good crops and bumper crops are extremely beneficial not just for propagating the next generation of oak trees, but good crops and bumper crops will have large and far-reaching effects across the ecosystem.

Left: Fully-developed acorn of northern red oak (Brandeis.edu); Right: Aborted acorns of northern red oak (Kurt Gottschalk, USDA Forest Service)



Acorn production in western Virginia, 1973-1995 showing year-to-year variability (Kurt Gottschalk, USDA Forest Service)

In our area, there are at least ninety different species that eat acorns and oak is the major hard mast source since the loss of the American chestnut. Mast crops significantly affect wildlife behavior as numerous studies report that wildlife can consume

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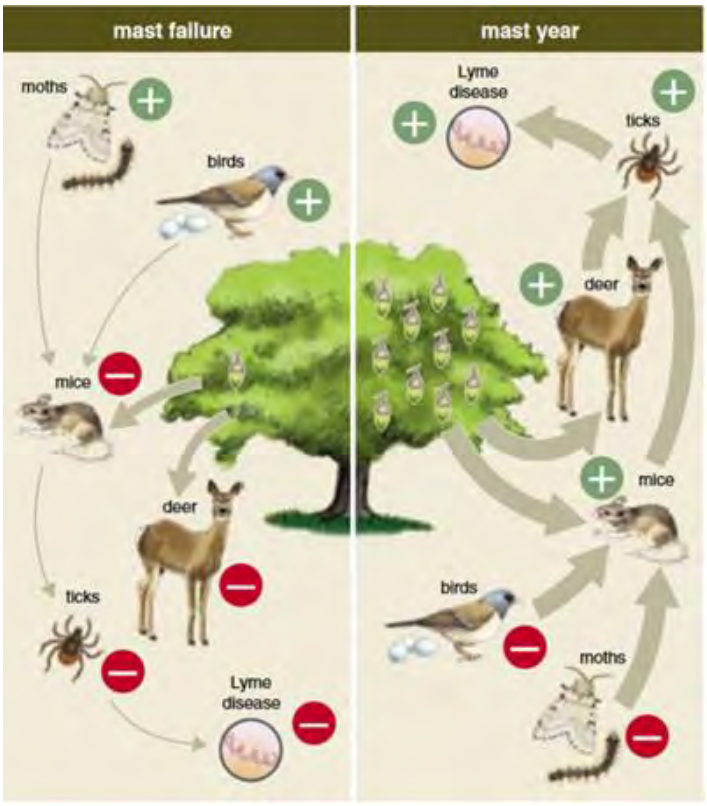
Acorn Production



Mast effects from oak in an eastern deciduous forest. (Walter Koenig)

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from 5% to 95% of an acorn crop. With such aggressive consumption of their acorn crops, the oaks need a hand in ensuring the survival of their acorns and this comes in the form of blue jays and squirrels. Both blue jays and squirrels are considered scatter hoarders as they collect acorns and bury them for future consumption. They don't always remember exactly where they hid all the acorns, so some survive to germinate the following season. Aside from acorns being a direct source of food, the tree itself can be used for foraging and shelter. There are approximately 534 native lepidopterans (caterpillars), such as the orange striped oakworm, that are known to feed on the foliage of the oak tree. These caterpillars also provide a source of food for neotropical migrant birds such as cerulean warblers, scarlet tanagers, and red-eyed vireos.

Neotropical migrants that use oak habitat.

As spring continues its advancement into summertime and sugar maples stop taking center stage, the oak trees will make their presence known with their pollen making people sniffle and sneeze, but a good pollen season now will be key to a good acorn mast crop in the fall.

References

Gottschalk, Kurt. 2015. Re: How to model acorn production based on tree size? Retrieved from: www.researchgate.net.

Andrew Rawcliffe is a Service Forester with DCR and covers the North Quabbin area.

The Service Forestry program is an outreach and regulatory program within the DCR, whose core mission is to encourage sustainable forest management on privately owned forest lands. DCR Service Foresters provide technical assistance and programs to landowners as well as to municipalities. Each Service Forester covers a district. Find out more about Service Forestry (including your local forester) at https://www.mass.gov/service-details/service-forestry

Growing on Trees

EPA Integrated Pest Management Series

May 4, 2021 | 2:00 - 3:30 p.m.

IPM After the Storm - Vector Considerations – Part 2

Find out more: EPA IPM Webcast Series

Urban Forestry Today

May 6, 2021 | 12:00 - 1:00 p.m.

Managing Fruit Trees in the Landscape

Wes Autio, PhD, UMass Amherst

May 20, 2021 | 12:00 p.m.

Diseases of Landscape Trees

Presenters: Dr. Nicholas Brazee, UMass Extension & Dr. Cameron McIntire, US Forest service

Free. Register here or find out more at urbanforestrytoday.org.

New England Forestry Foundation: Woods to People

May 12, 2021 | 2:00 - 3:00 p.m.

Woods to People

Kathleen Kolb, painter, and Verandah Porche, poet

Find out more and register at newenglandforestry.org

MDAR Spotted Lanternfly Series

May 18, 2021 | 10:00 - 11:10 a.m.

Spring Spotted Lanternfly Update

Arborist and Pesticide CEUs available. Register here and find out more at massnrc.org.

Additional webinars in the series: August 17, 2021 November 16, 2021 and February 15, 2022.

TREE Fund Webinar

May 11, 2021 | 1:00 - 2:00 p.m.

LiDAR based urban tree inventory permits a better evaluation of tree services: an example from Montréal Canada

Dan Kneeshaw, PhD, University of Quebec, Montreal

Find out more at treefund.org.

Urban Forest Connections

May 12, 2021 | 1:00 - 2:15 p.m.

Taking Flight: Urban Forest Stewardship for Bird Conservation using i-Tree Eco software

Dr. Wayne Arendt and Jerry Bauer, USDA Forest Service, and Robert Northrop, Univ. of Florida

Find out more: Urban Forest Connections website.

EPA Green Infrastructure

May 12, 2021 | 1:00 - 2:30 p.m.

Financing Green Infrastructure

Find out more: EPA Green Infrastructure Webcast Series

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Beetle Bites

Another Invasive - This Time Underground

Beetle Bites is a new section from the DCR staff of the Asian Longhorned Beetle Cooperative Eradication Program.

By **Chris Clarke**

It seems that just as the gypsy moth and winter moth outbreaks are subsiding, another invasive is invading our forests: worms. That's right Asian earthworms *Amynthas* spp. and *Metaphire* spp. are now being reported all over the state. Also known as snake worms, jumping worms, or crazy worms these fast-moving worms have a voracious appetite for the rich organic matter found in the duff layer of our forest floor. Their rate of reproduction and insatiable feeding can leave once fertile forest soil a depleted substrate with a consistency of coffee grounds.

After the last ice age, over 11,000 years ago, there were no earthworms in the Northeast. Earthworms in our area were brought with European settlers. None of the earthworms (*Lumbricus* spp.) we are used to seeing in the landscape in Massachusetts are native. However, we consider them beneficial for all the wonderful things they do for our landscape and garden soil, though they do also have a negative effect on forested landscapes. Asian earthworms, on the other hand, are cause for even more concern in the forest.

The issue is that our northeastern forests have evolved in an environment without earthworms. Trees rely on fungi, bacteria, and other microorganisms to help break down organic matter. If Asian earthworms consume the duff layer before the fungi and bacteria that the trees have relied on in a symbiotic relationship for thousands of years, the entire ecosystem is affected. Aeration of the forest soil can also lead to root aerification that can dry out the roots and the pellets left behind from feeding make it difficult to absorb soil nutrients. While European earthworms also consume organic matter in forests, Asian earthworms do so at a much faster pace. This has a devastating effect on the understory – from regenerating seedlings to creatures that rely on the duff layer and on understory plants.

Asian earthworm, *Amynthas* sp. (Susan Day, Univ. Wisconsin-Madison)

Topsoil degraded by Asian earthworms (Susan Day, Univ. Wisconsin-Madison)

The life cycle of the Asian worms is only a one-year life cycle compared to other earthworms which can live over six years. An annual life cycle means that Asian earthworms can reproduce much faster. Appearance-wise you will notice on the adults the clitellum (the ring that goes around the body) is smooth, white, and closer to the head. Coloration of the worm is more uniform— sometimes brown to gray with an iridescence to the skin. Movement is faster than *Lumbricus* spp. and is snake like. There are

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Another Invasive - This Time Underground

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some reports of an almost snake like striking if picked up: the worm will actually rear back and make a striking movement.

This summer, be on the lookout for fast-moving worms with snake like movements and report to Umass Turfgrass Entomology Lab okostromytsk@umass.edu.

How to Avoid Spreading Earthworms

- Be cautious when moving compost/bringing compost onto your property – purchase compost that has undergone a specified heating procedure (temperature and duration) to kill worm cocoons.
- If the worms are present in a small area on your property (flower bed/garden)– utilize a solarization technique since heat kills worms
- Remove soil from plants before planting (i.e., use bare root methods)
- Do not purchase *Amynthas* worms for composting

Find out More

Cornell Cooperative Extension. Jumping Worm Claymation Video

Resources from the Entomology Research Laboratory at the University of Vermont

UMass Extension Invasive Insect Webinar Series – Invasive Earthworms in Massachusetts

Cornell Cooperative Extension Ulster County. 2021. Jumping Worm.

Asian earthworms in the (semi) recent press, in the New York Times, The Atlantic, and the Greenfield Recorder.

Chris Clarke is a DCR forester with the Asian Longhorned Beetle Cooperative Eradication Program in Worcester.

Growing on Trees

UMass Diagnostic Services

Landscape and Turf Problem Diagnostics - The UMass Plant Diagnostic Lab is accepting **plant disease, insect pest and invasive plant/weed samples** (mail-in only). The lab serves commercial landscape contractors, turf managers, arborists, nurseries, and other green industry professionals. It provides woody plant and turf disease analysis, woody plant and turf insect identification, turfgrass identification, weed identification, and offers a report of pest management strategies that are research based, economically sound and environmentally appropriate for the situation. Accurate diagnosis for a turf or landscape problem can often eliminate or reduce the need for pesticide use. See the UMass website for instructions on sample submission. Please allow for additional time for samples to arrive at the lab and undergo the diagnostic process.

Soil and Plant Nutrient Testing - The UMass Soil and Plant Nutrient Testing Lab is accepting orders for **routine soil analysis** and **particle size analysis ONLY** (please do not send orders for other types of analyses at this time). Send orders via USPS, UPS, FedEx or other private carrier (no hand deliveries at this time). Processing time may be longer than usual. The lab provides test results and recommendations that lead to the wise and economical use of soils and soil amendments. For updates and order forms, visit the UMass Soil and Plant Nutrient Testing Laboratory web site.

Tick Testing - The UMass Lab of Medical Zoology is currently unable to accept samples for tick testing at this time. Please see here for a list of alternative testing facilities.

Growing on Trees

Attract Birds to Your Yard Naturally This Spring

Adapted from MassWildlife

Learn how to attract songbirds to your yard without a bird feeder.

You don't need a bird feeder to attract colorful and melodious birds to your yard or garden [or school or other area]. Seed from bird feeders can draw the unwanted attention of squirrels, chipmunks, turkeys, mice, rats, and even black bears. This can be harmful to these animals (and also to your feeders). Providing natural food sources, water, and shelter can bring birds to your property this spring and throughout the year.

Insect friendly and therefore bird friendly vegetation that you can plant in your own yard:

- Oaks—white oaks are the best species to promote native insects
- Black willow and pussy willow
- Black cherry and common chokecherry
- Birches
- Dogwoods
- Hollies
- Elderberry
- Mulberry
- Juniper
- Viburnums
- Shadbush/serviceberry/Amelanchier
- Blackberry, raspberry, blueberry, and Aronia berry

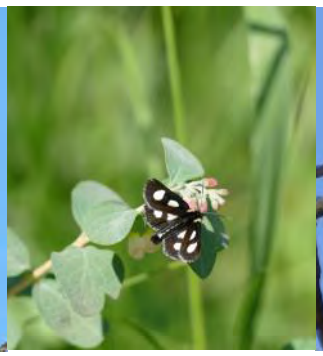
A healthy mix of native vegetation will draw a variety of species to your yard. Native trees and shrubs that produce berries (like dogwoods, serviceberries, cherries, blueberry) provide fruit in summer and/or fall, and are much more nutritious (high in fats and lipids) than fruits of non-native plants. During the summer when birds are nesting, the young are fed almost exclusively invertebrates like caterpillars. Native plants support a much higher diversity and number of invertebrates than non-native plants. This is especially true with caterpillars, which are the preferred food for young songbirds. Growing native plants in your yard can be the best way to attract many species of birds to the area.

Are you looking to attract hummingbirds? Or do you not have a lot of space to plant a tree or shrub? Native species of wild bergamot and red columbine have colorful, tubular flowers that will entice hummingbirds and butterflies! You might also include trumpet honeysuckle, cardinal flower, spotted impatiens, Canada lily, and native azaleas and rhododendrons.

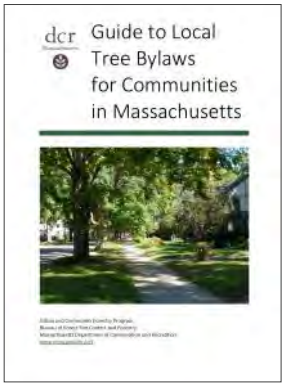
Find a list of native plants to attract birds by soil type and sunlight preference.

Find out more at MassWildlife.






Growing on Trees



New Resource for Municipalities

Guide to Local Tree Bylaws for Communities in Massachusetts

The DCR Urban and Community Forestry Program has completed a guide on local tree bylaws and ordinances for cities and towns in Massachusetts. This guide is designed for communities beginning the process of developing a local tree bylaw or ordinance. It can also be used to assist in the review of an existing one.

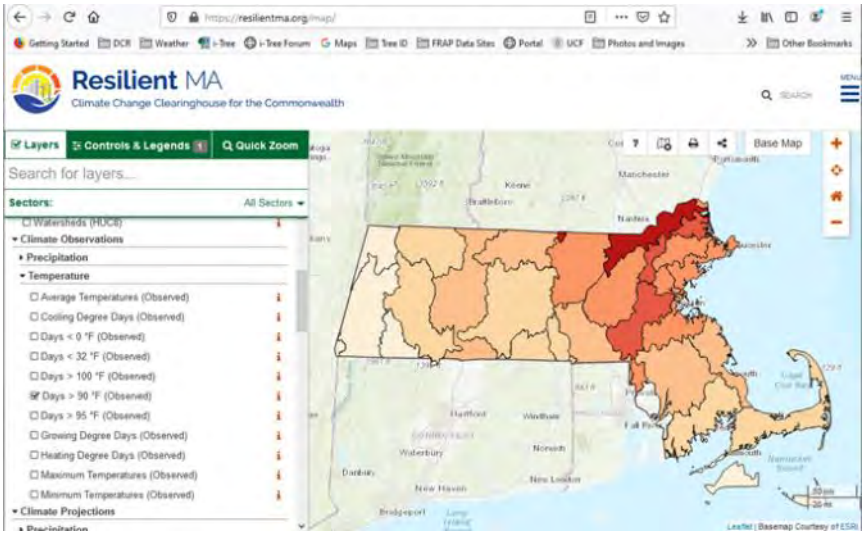
Trees are critical resources in our communities and a local tree bylaw can help protect this vital asset. In this guide, we have taken examples from bylaws and ordinances in Massachusetts and guidelines from the International Society of Arboriculture and other sources, and brought them together to provide relevant examples and advice for communities in the Commonwealth.

Check out the guide (PDF) on our Urban and Community Forestry Resources page.

Climate Change Resources for Massachusetts

Resilient MA Action Team (RMAT) Climate Resilience Design Standards Tool

This tool is a web-based platform that will help integrate climate projections and climate resilience design standards into state and local projects. The Climate Resilience Design Standards Tool, a first-in-the-nation web instrument, will use up-to-date climate projections to provide users a preliminary climate change risk level and recommendations to increase the resiliency of project design. The web tool was announced by Lieutenant Governor Karyn Polito and Energy and Environmental Affairs Secretary Kathleen Theoharides at a virtual event as part of the Administration's celebration of Earth Week in Massachusetts. Read the full press release here.



Resilient MA map

Create a map of climate change and related data using this interactive mapping tool. You can select data layers to display from a menu, filter layers by sector, vary parameters within certain layers, and select from a variety of base layers and regional boundaries. You can also import a data layer of your own and view it along with layers already in the map. For each layer, links are available to metadata and the original source. Find a map tutorial video here.

Find out more: https://resilientma.org/map/

Growing on Trees

Recognition Programs from the Arbor Day Foundation

Tree Campus Healthcare

The Arbor Day Foundation has recognized the first Tree Campus Healthcare in Massachusetts. **Notre Dame Health Care** in **Worcester** was recognized for its participation in the program for 2020. The program helps connect facilities that deliver inpatient services like hospitals and residential rehabilitation facilities to the greater urban and community forest.

Tree Campus Healthcare recognizes health care facilities of all sizes that meet five standards:

Standard 1: Advisory Committee
Standard 2: Facility Tree Care Plan
Standard 3: Community Forestry Project
Standard 4: Celebrate and Educate
Standard 5: Financial Investment

Find out more about Tree Campus Healthcare.

Tree Cities of the World

What do Kampala, Boulder, Halifax, Malmö, Brussels, Hyderabad, and Auckland all have in common? They are all Tree Cities of the World! This international program recognizes cities around the globe for meeting five standards that demonstrate their stewardship of the urban forest. The Tree Cities of the World program helps provide "direction, assistance, and worldwide recognition" for community efforts around trees in cities and towns of all sizes around the world.

The five standards:

Standard 1: Establish Responsibility
Standard 2: Set the Rules
Standard 3: Know What You Have
Standard 4: Allocate the Resources
Standard 5: Celebrate Achievements

There are no recognized Tree Cities of the World in New England…yet. (The closest are New York and Halifax.)

Find out more about Tree Cities of the World and how your community can participate.

Tree Campus USA Higher Education

College campuses can receive annual Tree Campus Higher Education recognition by meeting five standards. Two- and four-year accredited colleges and universities meeting these standards will receive recognition materials to showcase their dedication to the campus environment.

Standard 1: Campus Tree Advisory Committee
Standard 2: Campus Tree Care Plan
Standard 3: Campus Tree Program with Dedicated Annual Expenditures
Standard 4: Arbor Day Observance
Standard 5: Service Learning Project

News! Tree Campus Higher Education Conference this July

The Arbor Day Foundation will hold the first-ever virtual conference for the Tree Campus Higher Education network, coming this July 15th and 22nd. Our call for presentation proposals opens April 20th. Building on the success of the Tree City USA conference in February, this opportunity will empower leaders at recognized campuses to connect with and learn from their peers. Registration will be open on June 1st.

Tree Campus K-12

The Arbor Day Foundation postponed the inaugural year of Tree Campus K-12 recognition to the 2021-2022 school year in light of the continued challenges faced by schools and educators this year.

Visit www.treecampusK12.org to begin planning the 2021-2022 school year.

(Continued on page 15)

Growing on Trees

(Continued from page 14)

Tree Line USA

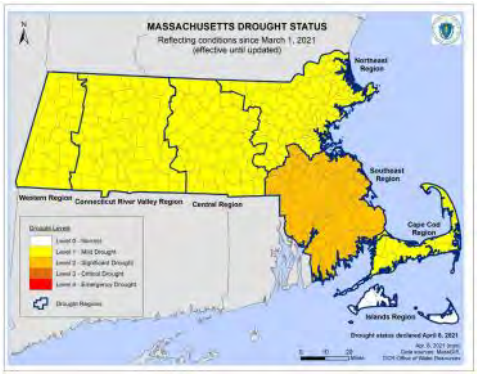
Tree Line USA recognizes best practices in public and private utility arboriculture, demonstrating how trees and utilities can co-exist for the benefit of communities and citizens. Utilities of all sizes may participate.

Participating utilities meet five standards:

- Standard 1. Quality Tree Care
- Standard 2: Annual Worker Training
- Standard 3: Tree Planting & Public Education
- Standard 4: Tree-Based Energy Conservation Program
- Standard 5: Arbor Day Celebration

Find out more about Tree Line USA.

Weather and Climate



Despite some recent precipitation, Massachusetts is still behind on normal precipitation. On April 8, Massachusetts declared a Level 2 – Significant Drought in the Southeast Region and a Level 1 - Mild Drought everywhere else except the Islands. If you have newly planted trees, be sure to keep them watered. Find tips on caring for new trees on our Caring for New Trees factsheet.

Find out More

Massachusetts Drought Status
https://www.mass.gov/info-details/drought-status#past-drought-declarations-maps-and-history-

The Northeast Regional Climate Center | http://www.nrcc.cornell.edu/regional/drought/drought.html

The U.S. Drought Portal | https://www.drought.gov/drought/states/massachusetts

National Climate Report | https://www.ncdc.noaa.gov/sotc/

Department of Conservation and Recreation Celebrates Arbor Day by Highlighting Legacy Tree Program

April 30, 2021 — Today, Department of Conservation and Recreation (DCR) Commissioner Jim Montgomery joined DCR Forestry staff for a tree assessment demonstration at Middlesex Fells State Reservation in the Town of Stoneham to celebrate Arbor Day. The demonstration, part of the agency's Legacy Tree Program, informed attendees about Legacy Tree qualities and the way trees are measured for the program.

"Arbor Day is an annual opportunity to focus our attention on the importance of trees to our communities, air providing benefits like beauty, shade, wildlife habitat, air purification and carbon sequestration," said DCR Commissioner Jim Montgomery. "The MA Legacy Tree Program celebrates the Commonwealth's exceptional trees by identifying, cataloging and promoting their whereabouts."

Read the full press release on the DCR website and find out more about the Legacy Tree Program.

Gleanings

The Cooler Communities Project

The Cooler Communities Project provides opportunities for public discussion around climate change solutions. Through student engagement embedded in curriculum work and related community fairs, the project highlights actions that individuals, households, and communities can take to reduce carbon emissions, with particular emphasis on wise use of energy. The goals of the project are:

- To empower K-12 students and celebrate their contributions to climate change solutions.
- Offer incentives for teachers and students to study climate change solutions within existing curriculum requirements.
- Lower the carbon footprints of communities throughout Massachusetts.

A major feature is the participation of K-12 students in a community fair at which they showcase what they have learned through lessons - based in STEM, ELA, history, and the arts – and teach their community about the most effective ways to reduce carbon emissions. School districts that participate in Cooler Communities Fairs receive grants of up to $5000. Presented in collaboration with community partners, each Cooler Communities Fair features climate-friendly vendors, exhibits, workshops, speakers, and family friendly activities.

3-min video – a quick overview of the Cooler Communities program.

Curriculum Guide – contains links to materials that are available to teachers for free or a small fee. Teachers are not required to use it. It provides resources and topic descriptions that may inspire and generate ideas for individual teachers or teaching teams.

Virtual Action platform – An example of how students and family members can learn about and take actions in a virtual context. Most actions are tied to projects that students have done.

Find out more at coolercommunities.org.

From the USDA Forest Service

New Video Series on the American Chestnut

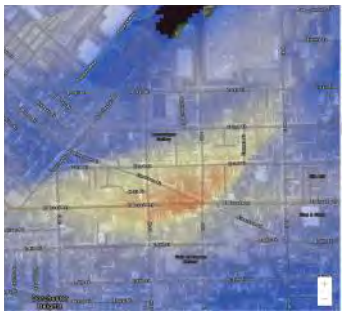
Once abundant in the eastern U.S., the American chestnut (*Castanea dentata*) has been decimated over the past century by exotic pests. A new set of online videos produced by the Forest Service explain the history and value of the American chestnut and efforts being undertaken to restore it. Part I offers an introduction and Part II showcases Forest Service and partner research on the tree.

From the Vault: Priceless Mahogany for U.S. Capitol Building Restoration

The attack on the U.S. Capitol Building in January 2021 left the historic structure damaged, including doors and wood fixtures made of priceless old-growth mahogany. The Forest Service Forest Products Lab has stepped in to help, supplying mahogany boards that had been in long-term storage for nearly 100 years. This type of wood would otherwise be nearly impossible to source due to its internationally protected status.

News

NOAA and Communities to Map Heat Inequities in 11 States This Summer



The National Integrated Heat Health Information System — a joint National Oceanographic and Atmospheric Administration (NOAA) and Centers for Disease Control and Prevention effort — NOAA's Climate Program Office, and CAPA Strategies LLC will support and coordinate new community-led campaigns to map urban heat inequities in 11 states across the country this summer.

Outcomes from the campaigns will include informing heat-mitigation decision-making (e.g., the City of Houston's Climate Action Plan), educating and spreading awareness to residents and policymakers (e.g. Museum of Science, Boston), applied research on the causes and effective solutions for urban heat islands (e.g. Hoffman et al., 2020), and science education on field campaigns and extreme heat.

Read the full article at noaa.gov and Click Here to See a Story Map of the Project→

Leading Standards and Urban Forestry Partners Collaborate to Develop a New SFI Urban and Community Forest Sustainability Standard

April 1, 2021—The Sustainable Forestry Initiative Inc. (SFI) is pleased to announce the launch of a partnership to develop a new SFI Urban and Community Forest Sustainability Standard for application in North America and potentially globally. SFI will collaborate with five urban forestry leaders: American Forests, Arbor Day Foundation, the International Society of Arboriculture, the Society of Municipal Arborists, and Tree Canada.

"The SFI network is looking forward to collaborating with our urban forestry partners to promote the establishment of sustainable urban and community forests that meet local needs, while meaningfully contributing to national, bi-national, and global initiatives such as the 2 Billion Tree initiative in Canada or through regional and global initiatives such as the World Economic Forum's 1t.org," says Kathy Abusow, SFI's President and CEO. "Together, with these leaders, I'm confident SFI will positively contribute to urban forestry initiatives across North America and globally."

Find out more at forests.org.

Headlines in Brief

Massachusetts

Study: Northeastern U.S. Has Widest Tree Cover Disparities In The Country

City of Cambridge Launches Healthy Forest Healthy City Initiative

Metal Fence Proposed to Protect 400-Year-Old Buttonball Tree in Sunderland

My Turn: Speaking for The Trees (Opinion)

A Plant Lover's Guide To 16 Gorgeous Gardens and Arboretums Around New England

National & International

Forest Service Eastern Region Distributes $4.2M in Grants to Support Healthy Forests

Safety Concerns Bring Down Largest Sugar Maple in US

Delaware Department of Agriculture First State Agency to Make 1t.org Pledge

Honolulu is Losing Trees When We Need Them More Than Ever. Can New Initiatives Save Us?

The 'Brown Gold' That Falls from Pine Trees in North Carolina

On the Horizon

May 4 Webinar: IPM After the Storm, 2pm

May 6 Virtual Class: ISA Board Certified Master Arborist Prep Course, New England ISA

May 6 Webinar: Managing Fruit Trees in the Landscape, 12pm

May 11 Webinar: LiDAR-Based Urban Tree Inventory, 1pm

May 12 Webinar: Woods to People, New England Forestry Foundation, 2pm

May 13 Webinar: Drought and Urban Trees, Tree Wardens Association of CT, 12pm

May 20 Webinar: Diseases of Landscape Trees, 12pm

Jun 22 Webinar: Why Do Some Trees Transplant Better than Others?, TREE Fund, 1pm

Jul 27 Webinar: A Three Pronged Approach to Understanding The Defensive Mechanisms in Green Ash Resistant to EAB, TREE Fund, 1pm

Aug 5 Tree Risk Assessment Qualification Renewal, New England ISA, Brattleboro, VT

Aug 27 Workshop: TCIA Aerial Lift Specialist and Compact Lift Specialist, New England ISA, Portsmouth, NH

Sept 6-29 Online Course: ISA Certified Arborist Exam Prep Course, New England ISA

Sept 6-29 Online Course: ISA Board Certified Master Arborist Prep Course, New England ISA

The New England Chapter-ISA maintains a calendar with many online opportunities. Check it out here: https://newenglandisa.org/events

The Citizen Forester is made possible through a grant from the USDA Forest Service Urban and Community Forestry Program and the Massachusetts Department of Conservation and Recreation, Bureau of Forestry.

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www.mass.gov/dcr/ucf

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.